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Report on Public Finances in EMU

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CONTENTS

Summary 1

Part I: Current developments and prospects 7

Key findings 9
1. Current developments 10
1.1. Economic developments and perspective 10
1.2. Assessment of short-term developments in fiscal balance 12
1.3. Developments in debt 15
1.4. Composition of public finances 16
2. Implementation of fiscal surveillance 22
2.1. The Excessive Deficit Procedure 22
2.2. The significant deficit procedure 24
2.3. The European semester and the fiscal Country-Specific Recommendations 25
2.4. Closing the fiscal surveillance cycle in the euro area: Draft Budgetary Plans 26
References 31
A1. Overview of EDP and SDP steps and Country-Specific fiscal Recommendations 32

Part II: Recent developments in fiscal surveillance 39

Key findings 41
1. Introduction 42
2. The recent agreement of the Economic and Financial Committee on a greater focus on the Expenditure Benchmark 45
2.1. The rationale behind the EFC agreement 45
2.2. Definition and rationale behind the expenditure benchmark 46
2.3. Improving the assessment of effective action in the context of the Excessive Deficit Procedure 47
2.4. Clarifying the working of the preventive arm of the SGP 54
3. The Commission's "constrained judgement" approach to assess the output gap 57
3.1. The use of "constrained judgement" in relation to output gap estimates 57
3.2. Implementation of the "plausibility tool's" results within "constrained judgement" 58
3.3. Implications of "constrained judgement" for fiscal surveillance 62
3.4. Results of the application of "constrained judgement" in the fiscal surveillance exercises since autumn 2016 63
References 70

Part III: Impact of fiscal policy on income distribution 71

Key findings 73
1. Introduction 74
2. Main effects of fiscal policy on income inequality: a literature review 77
2.1. Distributive effects of the tax and benefit systems 77
2.2. Distributive effects through transfers in kind 79
2.3. Distributive effects from indirect taxation 81
3. Effectiveness of fiscal policy in reducing income inequality in the EU: what do the data say? 82
3.1. Direct effects through the tax and benefit systems 82

3.2. Total effects of fiscal policy on inequality: a regression analysis 92
4. Fiscal policy and economic fluctuations: an analysis of automatic stabilisers across income groups 98
4.1. Automatic stabilisation of income and demand in the EU: a microeconomic perspective 102
4.2. Automatic stabilisation of income, demand and GDP in the EU: a macroeconomic perspective 106
5. Conclusions 109
References 111
A1. Supplement to Chapter III.2. 118
A2. Supplement to Chapter III.3. 120
A3. Supplement to Chapter III.4. 127
A3.1. Background information on the microsimulation model EUROMOD 127
A3.2. Additional coefficients for automatic stabilisation of income and demand from a microeconomic perspective 127
Part IV: Government investment in the EU: the role of institutional factors 133
Key findings 135
1. Introduction 136
2. Insights from a short review of the academic and policy literature 138
2.1. The economic drivers of public investment 138
2.2. The fiscal drivers of public investment 139
2.3. The political economy drivers of public investment 139
2.4. The crucial role of sub-national authorities in public investment 143
2.5. Government investment efficiency 145
3. An empirical investigation of the drivers of public investment with a focus on the role of institutional factors 151
3.1. Estimation strategy 151
3.2. Main results 152
4. Five case studies on institutional features hampering public investment 159
4.1. Selection of countries and main results 159
4.2. Detailed case studies 160
5. Conclusions 169
References 171
A1. Public investment (% of GDP) by the different levels of government in the EU countries 179
A2. Shares of public investment by the different levels of government in the EU countries 181
A3. Synoptic literature review of public investment drivers 183
A4. Additional tables to Chapter IV.3. 186
Part V: Resources 187
1. Abbreviations and symbols used 188
2. Glossary 190
3. Useful internet links 195

LIST OF TABLES

I.1.1.	Budget balances in EU Member States (% of GDP)	13
I.1.2.	Euro area - Breakdown of the general government budget balance (% of GDP)	14
I.1.3.	Composition of changes in the government debt ratio in Member States (% of GDP)	15
I.1.4.	Government revenue and expenditure (% of GDP)	18
I.2.1.	Overview of individual Commission opinions on the DBPs - Member States under the preventive arm of the SGP	29
I.2.2.	Overview of individual Commission opinions on the DBPs - Member States under the corrective arm of the SGP	30
I.A1.1.	Overview EDP steps – Euro area member States	32
I.A1.2.	Overview EDP steps - Non-euro area Member States	32
I.A1.3.	Overview EDP steps - Greece	32
I.A1.4.	Overview SDP steps - Romania	32
I.A1.5.	Overview of Council Country-Specific Recommendations relating to fiscal policy	35
II.3.1.	Output gap flagged by the "plausibility tool" – Year 2016a	65
II.3.2.	Output gap flagged by the "plausibility tool" – Year 2016b	66
II.3.3.	Output gap flagged by the "plausibility tool" – Year 2017	67
III.3.1.	Evolution of median income and prices since 2005	85
III.3.2.	Decomposition of Gini elasticities (EU-28, average 2004-2014)	89
III.3.3.	Regression results – baseline specification	96
III.3.4.	Regression results – key fiscal policy components	97
III.4.1.	Degree of smoothing from automatic stabilisers	107
III.A1.1.	Equivalent monetary impacts of the provision of public services in terms of redistribution	118
III.A2.1.	Components of market and disposable income	120
III.A2.2.	Impact of sub-components of the cash-benefit system on income inequality	123
III.A2.3.	Regression analysis - sources and summary statistics	124
III.A2.4.	Regression analysis - correlation matrix	125
III.A2.5.	Regression findings - sensitivity analyses for fiscal variables	126
IV.2.1.	Sub-national capacities for effective management of public investment	147
IV.3.1.	Regression results - baseline specification	153
IV.4.1.	General government investment trends in the EU	159
IV.4.2.	Topics discussed in the country analysis	160
IV.A3.1.	Synoptic literature review of public investment drivers	183
IV.A4.1.	Summary statistics	186
IV.A4.2.	Correlation matrix	186

LIST OF GRAPHS

I.1.1.	Interest rates on loans to NFCs, selected Member States	10
I.1.2.	Growth of credit to NFCs, selected Member States	10
I.1.3.	Real GDP growth and its components, EU	11
I.1.4.	Real long-term interest rate and discretionary fiscal effort, euro area	15
I.1.5.	Trends in revenue and expenditure since the crisis	17
II.2.1.	EDP decision tree for assessing effective action	48

II.2.2.	"Old" careful analysis	49
II.2.3.	"New" careful analysis	50
II.3.1.	The common methodology estimate falls inside the range of plausible values defined by the "plausibility tool"	60
II.3.2.	The common methodology estimate falls outside the range of plausible values defined by the "plausibility tool"	61
II.3.3.	Plausibility range for the scenario of Graph II.3.2	61
III.2.1.	Stylised overview of main drivers of income inequality	77
III.3.1.	Developments of income inequality since 1980 for selected EU country groups	82
III.3.2.	Income inequality and government redistribution across regions	85
III.3.3.	Income inequality and government redistribution across EU Member States	85
III.3.4.	Gini index and income share ratios	86
III.3.5.	Relationship between market inequality and government redistribution	86
III.3.6.	Main receivers from and contributors to government redistribution by decile	87
III.3.7.	Impact of sub-components of the tax and benefit system on income inequality (Gini elasticities in per cent)	88
III.3.8.	Inequality of market and disposable income before and after the Great Recession	90
III.3.9.	Changes in income inequality and redistribution since the Great Recession	92
III.3.10.	Changes in net transfers following the Great Recession	92
III.3.11.	Relationship between inequality and disaggregated fiscal policy items	95
III.4.1.	Automatic income stabilisation coefficients	102
III.4.2.	Progressivity of the tax system and income stabilisation	104
III.4.3.	Relationship between government redistribution and stabilisation of income	105
III.4.4.	Automatic demand stabilisation coefficients	106
III.A1.1.	Indirect taxes as a percentage of disposable income and of expenditures	119
III.A2.1.	Contributions to government redistribution: direct taxes vs. social transfers	121
III.A3.1.	Kernel densities	129
III.A3.2.	Income stabilisation by quintile	130
III.A3.3.	Demand stabilisation, sensitivity analysis	131
IV.1.1.	Investment trend in the EU	136
IV.1.2.	Share of public investment by subsector in the EU	136
IV.1.3.	Public investment by subsector in the EU as a share of GDP	136
IV.2.1.	Share of sub-national governments in several budgetary items compared to its share in investment	143
IV.2.2.	Share of sub-national government	143
IV.2.3.	Debt as a percentage of revenues by levels of governance	144
IV.2.4.	Deficit as a percentage of revenues by levels of governance	144
IV.3.1.	Reduction of debt impact through institutional quality – strength of fiscal rules	154
IV.3.2.	Reduction of debt impact through institutional quality – governance framework	1554
IV.4.1.	Sub-national investment as a share of total public investment	159
IV.A1.1.	Public investment (per cent of GDP) by the different levels of government in the EU countries	179
IV.A2.1.	Shares of public investment by the different levels of government in the EU countries	181

LIST OF BOXES

II.1.1.	The Commission proposal for incorporating into EU law the substance of the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union	43
II.2.1.	A numerical example of the expenditure benchmark in the corrective arm of the SGP	51
II.2.2.	Derivation of the expenditure benchmark in the preventive arm of the SGP	56
II.3.1.	Technical description of plausibility tool	59
II.3.2.	The application of discretion in the autumn 2017 fiscal surveillance exercise	68
III.3.1.	Indicators of income inequality and redistribution through fiscal policy	83
III.4.1.	Indicators of automatic stabilisers of income and consumption: micro- vs. macro-perspective	99
III.4.2.	Analysis of automatic stabilisers in QUEST	108
IV.2.1.	Public sector investments in intangible assets – facts and figures	140
IV.2.2.	Public and private investment: crowding in or crowding out	142
IV.2.3.	The difficulty of measuring quality of public management	149
IV.3.1.	Public investment gap	156

FOREWORD

The economic recovery in the European Union (EU) has gained further momentum: for the first time since 2007 all Member States are expected to exhibit positive economic growth rates over the forecast horizon, unemployment is decreasing and the fiscal outlook is improving due to the cyclical upswing. Nevertheless, as Part I of this year's Public Finances in EMU report shows, the recovery is still supported by exceptionally accommodative monetary policy and the legacy of the crisis remains visible in several areas. Low productivity growth remains a key concern as it affects wage behaviour in the short term and potential growth in the longer run. The remaining investment gap, the subdued wage and inflation dynamics, and the high long-term and youth unemployment rates, together with a large current account surplus suggest that there is scope for robust growth to continue without inflationary pressures. The key policy challenge would be to exploit the favourable cyclical conditions to implement reforms needed to boost potential growth and reduce inequalities.

In this context, inequality has become a hot topic in the public debate and it is now firmly on the radar screen of international organisations. The fall-outs of the Great Recession are aggravated by the wide-spread perception of unfair burden-sharing across the society. Therefore, the rise in inequality has crystallized the discontent of many European citizens. Against this backdrop and at the current juncture, inequality matters particularly because democratic support can only be maintained if the benefits of the recovery are shared by all parts of the society. But inequality also matters since empirical and theoretical evidence shows that excessively high inequality can weaken aggregate demand, hamper social mobility and contribute to a misallocation of resources, with a risk of weighing upon growth prospect.

Part III of this report analyses the impact of fiscal policy on income inequality. It shows that Europe's welfare systems have substantially mitigated the rise in market income inequality. Overall, redistribution through the tax and benefit system in the EU has reduced income inequality by almost one third so that household income inequality is still much lower than in the US. This is related to the fact that government redistribution in the EU has increased significantly since the 1980s. Redistribution is also relevant in stabilising the economy across economic cycles. When the economy slows down, government revenue decreases and public spending stays broadly unchanged, supporting income and consumption. Part III of this report shows that the automatic stabilisation of household income is fairly high (albeit heterogeneous across Member States), providing demand support when needed. These findings have to be somewhat nuanced, when focusing on the total effects of fiscal policy. The inequality-reducing effects of certain policies seen in the short-term may be reduced by indirect effects in the long run. Thus, the composition of spending is essential to reduce inequality in the longer run: spending for education and health, together with sickness, disability, family and child benefits, have reduced income inequality in the EU on average. Policies aimed at addressing inequality therefore require careful design, if they are to be successful.

Part IV focuses on the determinants of public investment. It is the second time in a row that we focus on public investment, due to its importance not only to improve demand in the short term, but also to foster potential growth in the long term. The findings show that fiscal factors are decisive, since a high level of public debt or deficit seems to weigh on public investment. Moreover, institutional factors are key to raising the quality of investment. In particular, we show the crucial role of good governance and of better sub-national administrative practices in encouraging higher investment. These factors, especially strong national fiscal rules and good governance, can mitigate the drag of public debt on investment.

Going forward, taking advantage of better times to reduce high public indebtedness and improve public policy governance and institution would boost public investment. This is essential to improve our growth potential, with all its beneficial effects on the social fabric. Conversely, reducing income inequality via well designed fiscal policy may strengthen the capacity of governments to carry out needed policies, not least to boost fiscal sustainability and restoring fiscal buffers.

Marco Buti
Director General Economic and Financial Affairs

EXECUTIVE SUMMARY

Economic activity in the European Union (EU) has strengthened

The recovery has gained further momentum amid continued support from macroeconomic policies. According to the Commission autumn forecast 2017, GDP growth is projected to climb to 2.3% in the EU (2.2% in the euro area) in 2017, which is higher than expected in the spring. For the first time since 2007, all EU Member States are forecast to show positive growth rates over the forecast horizon. The pick-up in growth comes mainly from internal demand, reflecting lower uncertainty, improved labour market conditions and higher profits.

The cyclical upswing brightens the fiscal outlook …

Part I of this report shows that the fiscal outlook is largely driven by the cyclical upswing and the low interest environment rather than fiscal policy measures. Headline general government deficits are expected to continue their downward trend as improved cyclical conditions and lower interest payments drive down expenditure-to-GDP ratios. The aggregate headline deficits of the EU and the euro area are forecast to fall to around 1% of GDP in 2018, 0.4 percentage points smaller than in 2017. The structural deficit, however, is expected to increase moderately to just over 1% of GDP in the EU and euro area, a level around which it has been hovering since 2014. Government debt as a percentage of GDP is projected to decline slowly to 81.6% in the EU (87.2% in the euro area) in 2018 due to higher nominal GDP growth and historically low interest rates.

… and more Member States leave the excessive deficit procedure

The excessive deficit procedure (EDP) for Portugal, Greece and the UK was abrogated in 2017 and the deficit of France is forecast to be below the 3% of GDP threshold already this year, according to the Commission autumn forecast 2017. Only in Spain government deficit is forecast to remain above 3% in 2017.

However, the recovery remains incomplete and less advanced than in other developed economies

Nevertheless, the legacy of the crisis can still be felt. Although investment is picking up and investment gaps are shrinking, they remain sizeable in several Member States. Similarly, although labour markets are improving, both long-term and youth unemployment remain high and wage dynamics, as well as inflation (expectations), are subdued. Productivity growth also remains lower than hoped. Overall, this suggests that there may be scope for robust growth to continue without inflationary pressures.

A broadly neutral fiscal stance remains appropriate for the euro area in 2018

Against the background of a strengthening but incomplete recovery, a broadly neutral fiscal stance appears appropriate for the euro area as a whole in 2018. This would strike an adequate balance between the objectives of stabilising the economy in the short-term and ensuring sustainability of public finances in the medium- to long-term. The aggregate situation conceals considerable differences between Member States, with some facing the need to consolidate, while others have some fiscal space. This requires a differentiated approach to national fiscal policies within the rules of the SGP.

Changes in the implementation of the EU fiscal framework aim to address key

Part II presents changes in the implementation of the EU fiscal surveillance framework, which were introduced in 2016 and 2017 in full respect of the SGP. First, to balance stabilisation needs with sustainability challenges, the Commission exercises the degree of discretion allowed for in the boundaries of the existing rules when assessing departure from the required fiscal

challenges ...

adjustment. Second, to address the uncertainty linked to the measurement of the output gap, the Commission exercises also –under limited and specific circumstances agreed by Member States–"constrained judgement". In such cases, the Commission can depart from the output gap estimates of the commonly agreed methodology in its assessment of the cyclical position when conducting its fiscal assessments, while providing –case by case– explanations for such departures in an open and transparent manner. Finally, to increase further transparency and predictability, a larger role is now given to the expenditure benchmark when assessing compliance with the SGP, although the change in the structural balance (the traditional indicator of fiscal effort) remains an important factor.

This year's report looks at two themes: income distribution and public investment

This year's Public Finances in EMU report looks at two areas of fiscal policy that are particularly important in Europe's current economic context. Part III focuses on the impact of public finance policies on income distribution, including the functioning of automatic stabilisers. While recognising the essential role of equally important dimensions such as the inequality of opportunities or wealth, which are also addressed through policies improving productivity and real wages, upgrading skills and providing equal opportunities to all citizens, the report concentrates on the inequality of incomes, which plays a key role in affecting the social fabric. Part IV analyses key determinants of public investment, which is an important driving force behind potential growth in the medium- to long-run. This part puts a special focus on institutional factors hampering investment at the sub-national level.

Fiscal policies affect income distribution both directly and indirectly

Part III distinguishes between *direct* and *indirect* effects of fiscal policy on income distribution. Fiscal policy can have a *direct* impact on disposable/net household income (i.e. after taxes and benefits) through the design of the tax and benefit system. In addition, fiscal policy can also have *indirect* effects on income distribution via two main channels: First, it can cause behavioural responses of firms, workers and consumers, which can influence economic outcomes and affect market incomes (i.e. before tax and benefits). For instance, higher social transfers or taxes can distort incentives to work, increase unemployment and increase market/gross income (i.e. before taxes and benefits) inequality. Second, indirect effects also depend on the sustainability of government finances, since a high government debt weighs on growth and exposes economies to risks of deeper recessions in the event of a financial crisis. Overall, the indirect effects of certain policies may partly offset the inequality-mitigating direct effect.

Europe's welfare systems significantly reduce disposable income inequality...

Part III of this report shows that inequality of *market/gross* income has increased significantly in the EU since 2000 so that the EU faces today the same level of market income inequality as the US. Europe's advanced welfare systems, however, have substantially mitigated this rise in market income inequality. Overall, redistribution through tax and benefit system in the EU has directly mitigated income inequality by almost one-third. As a consequence, household disposable income inequality (i.e. after taxes and transfers) has remained almost constant over the last decade and it still much lower than in other advanced economies. Since the 1980s, government redistribution in the EU has increased significantly and it is much higher than in other advanced economies (almost twice as great as in the US). Across the EU, the most "egalitarian" EU Member States appear to

be found in the north and centre of Europe (SI, SE, CZ, SK, FI, DK, NL, BE and AT). In general, Member States with higher market inequality tend to redistribute more.

While government redistribution runs from the high- to the low- and middle-income households, the lower middle class receives the largest support

In most Member States, low- and middle-income households are net receivers of the tax and benefit system, while high-income households are net contributors. Those outcomes reflect the progressivity of the tax and benefit systems. Government redistribution through the tax and benefit system tends to be particularly targeted to the lower-middle class (of the second, third and fourth income deciles), which receives the largest net transfers in per cent of GDP across income deciles.

The composition of public spending plays a significant role in correcting inequality

The report presents new empirical evidence on the total (i.e. direct and indirect) effect of fiscal policy on income inequality using cross-country time series for Member States since 1980. The results show that education and health spending, together with sickness, disability, family and child benefits, have significantly reduced income inequality in the EU on average over the medium-term. Some other expenditure items that aim to reduce inequality, however, appear to have little long-term impact on income inequality. While those findings may warrant further study, they seem to suggest that the short-term inequality-reducing direct effects of certain policies may be hampered by indirect effects in the medium- to long-run for the EU on average. Fiscal policies aimed at reducing inequality therefore require careful design, if they are to be successful.

Tax and benefit systems can help to automatically stabilise income and consumption over the cycle....

The tax and benefit system represents a tool that can automatically, i.e. without the need for policy-makers to take action, help dampen economic ups and downs. When the economy slows down, government revenue decreases while public spending stays broadly unchanged or slightly increases (mainly due to higher unemployment benefits). The overall effect stimulates domestic consumption (i.e. demand) and the headline budget balance deteriorates. Conversely, when the economy grows, government revenue increases while expenditure slightly decreases. This has a curtailing effect on domestic demand and results in an improving headline budget balance. That mechanism therefore provides automatic income and consumption support in real time during crisis periods and mitigates the risk of overheating in boom periods.

...an effect which is quite high in the EU but which varies from country to country...

Part III of this report analyses the size of direct automatic stabilisers in Member States using the microsimulation model EUROMOD. The findings show that the automatic stabilisation of household income is fairly high in the EU. In the EU around 35% of a decline in market income is absorbed by the tax and benefit system on average. The size of stabilisation, however, varies across Member States, from 20% of income in Bulgaria to almost 45% in Austria. Finally, the results reveal that the more progressive the tax and benefit system, the higher the stabilisation.

Automatic stabilisers contribute to stabilising consumption sizeably

Apart from the stabilisation of income, the stabilisation of consumption (i.e. demand) plays an important role for the real economy. This report shows that the average size of consumption stabilisation is close to 65% for the EU on average. As a result, consumption decreases (increases) by only 35% following a fall (rise) of market income. The degree of consumption

stabilisation varies across Member States, from 57% in Cyprus to 68% in Denmark. In general, consumption stabilisation is higher than income stabilisation, since households usually do not consume the entire amount of the additional income received from the tax and benefit system, but save part of it. That saving behaviour adds to the income smoothing effect of taxes and benefits.

However, the actual level of consumption stabilisation is less when behavioural and macro adjustment effects are considered

This report also analyses the automatic stabilisation effects on income and consumption for Italy. Italy is chosen since it represents a large Member State with an average size of automatic consumption stabilisation. The short-term *direct* effect is obtained using EUROMOD, while the long-term *total* effects are based on the macro simulation model QUEST, which takes into account behavioural and macroeconomic feedback effects. The findings show that the total consumption stabilisation effect is smaller than the direct effect for a similar shock. It amounts to around 55% in the first year, before decreasing to 30% in the second year. That evolution can be explained by the immediate behavioural response of consumers to future income expectations, the price adjustment in the economy and the full internalisation of other general equilibrium effects such as government measures to secure the sustainability of public finances.

Better government spending could improve long term economic potential

Investment remains at the top of the economic policy agenda in the EU in order boost productivity, job creation, and growth and to tackle the legacy of low investment since the Great Recession. As indicated in Part I, private investment has finally started to rebound, but public investment, while increasing, still remains well below pre-crisis levels.

Public investment levels are determined by economic, political-economy and fiscal factors …

Part IV of this report analyses the main determinants of government investment with a focus on institutional factors and the sub-national level. A survey of the literature shows that government investment is determined by three types of factors. First, economic factors can affect public investment, since countries with higher GDP or younger populations tend to invest more, often in a pro-cyclical manner. Second, political economy factors can influence investment, as countries tend to invest more around election times. Third, fiscal factors are decisive, since a high level of public debt or deficit seems to weigh on public investment.

… while institutional factors are decisive for the quality of investment

Institutional aspects are particularly important, since countries with more efficient governance and well-functioning public services appear to carry out public investment of better quality, i.e. better managed and prioritised, with a greater value for money, while a poor design of national fiscal frameworks is associated with lower quality investment.

Strong national fiscal rules and good governance can mitigate the drag of public debt on investment...

Part IV presents findings from a quantitative analysis of the key determinants, which confirms the relevance of fiscal factors, beyond the economic, political-economy and institutional determinants. In addition, the analysis shows that while public investment is hampered by high levels of public debt, that effect can be reduced by the adoption of stronger fiscal rules at the national level and a high quality of governance.

...while better sub-national administrative practices can encourage higher investment

Sub-national authorities are responsible for more than half of public investment in the EU. In carrying over this task, they face challenges in terms of the governance of investment, which are analysed in greater detail for five Member States. The case studies indicate that there is room to improve the management of public investment in all the selected Member States, especially in areas such as coordination and financing across levels of government, procurement procedures, and administrative capacities, which help to ensure better quality control. Those institutional features need to be tackled to increase the value for money of public investment. Higher quality investment is also associated with a stronger impact on potential growth in the long-run.

Part I

Current developments and prospects

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KEY FINDINGS

This part describes current developments and prospects in fiscal policy, including the aggregate fiscal stance, the overall assessment of the draft budgetary plans and the budgetary implications of the autumn forecast, in line with last year's Public Finance Report.

The economic recovery is expected to continue, but remains atypical and incomplete.

- According to the Commission autumn forecast 2017, the recovery is set to continue in a changing policy context. Domestic demand is expected to remain a key driver of growth. Monetary conditions are expected to remain accommodative, while monetary policy is on a gradual road to normalisation.

- At the same time, the recovery remains incomplete and several features of the economic expansion such as a persistent labour market slack and subdued inflation are atypical, showing scars from the legacy of the crisis.

In this context, a broadly neutral fiscal stance for the euro area appears appropriate, at the aggregate level.

- The aggregate headline deficit is expected to continue its downward trend on the back of cyclical improvements. After a marginal improvement in 2017, the structural balance is projected to slightly increase in 2018 by 0.1% of GDP, pointing to the continuation of a broadly neutral fiscal stance.

- While a broadly neutral fiscal stance appears appropriate at this juncture at the aggregate level, individual Member States need to adopt stances appropriate to their specific circumstances to ensure debt sustainability while supporting growth and employment.

- The improved outlook for nominal GDP growth and historically low interest rates support the deleveraging of the public sector, but debt levels continue to vary significantly across Member States.

- The improvement in the headline budget balance is projected to be mainly driven by further decline in the expenditure-to-GDP ratio, thanks to the impact of the economic recovery on automatic stabilisers and lower interest expenditure.

All Member States need to comply with the SGP requirements for 2018.

- In 2017, no new EDPs were opened, while EDPs were abrogated for Portugal, Greece and the UK.

- In the preventive arm, a significant deviation procedure was opened for Romania in mid-2017, with a recommendation to correct a significant deviation from the adjustment path toward the MTO. However, on 5 December 2017, the Council adopted a decision establishing that Romania has failed to take effective action to correct a significant budgetary deviation. A revised recommendation for 2018 has been issued.

- None of the 2018 Draft Budgetary Plans (DBP) submitted by euro area Member States has been found in particularly serious non-compliance with the requirements of the Stability and Growth Pact (SGP). In six cases, however, the Commission found that the planned fiscal adjustment fell short of the requirements of the SGP, or appeared at risk of doing so.

1. CURRENT DEVELOPMENTS

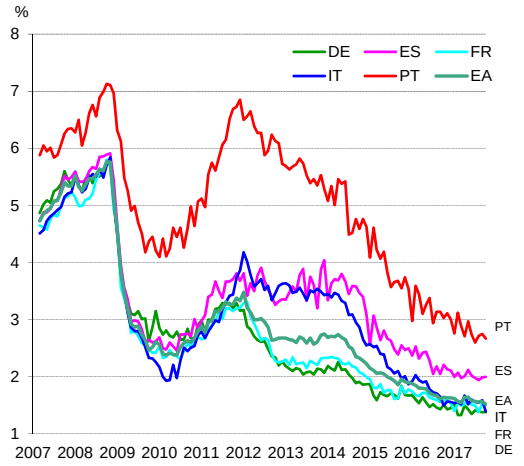
1.1. ECONOMIC DEVELOPMENTS AND PERSPECTIVE

The economic recovery has strengthened this year but remains atypical and incomplete. The EU economy continues to grow propelled by domestic demand, improving labour market conditions, increasing support from the global growth and trade rebound, and supportive financing conditions made possible by accommodative monetary policies. The pace of economic growth has increased in 2017 and the upturn has become increasingly broad-based across Member States. However, the recovery remains atypical and incomplete as evidenced by persistent labour market slack, subdued inflation and wage growth, and appears to still be supported by the exceptional tailwinds such as the ECB's accommodative monetary policy.

The ECB accommodative monetary policy has been crucial in supporting the recovery. The accommodative monetary policy conducted by the ECB ([1]) has restored the transmission channels of monetary policy and helped to lower financing cost. Euro area banks have further lowered interest rates to non-financial corporations (NFCs) and households over the past years (Graph I.1.1), contributing to the gradual recovery in lending volumes in the euro area (Graph I.1.2). More broadly, such monetary policies have also helped to ease access to funding, facilitated deleveraging, and helped the steepening of the euro area yield's curve, which has started easing pressures on bank profitability. According to the ECB, past non-standard monetary policy measures are estimated to have had a cumulated positive impact on real GDP of about 1.3pps over a three-year horizon. ([2])

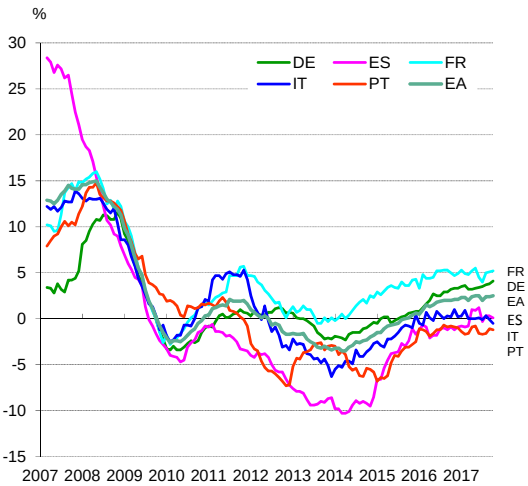
According to the Commission autumn forecast 2017, the recovery will continue in a changing policy context. After having reached 1.8% in 2016, euro area GDP growth is projected to accelerate somewhat to 2.2% in 2017 (2.3% in the EU from 1.9% in 2016).

Graph I.1.1: **Interest rates on loans to NFCs, selected Member States**



Source: European Central Bank.

Graph I.1.2: **Growth of credit to NFCs, selected Member States**



Source: European Central Bank.

This is more favourable than what expected in the Commission spring forecast 2017. In fact, the outlook for a continuation of the recovery has brightened. There is plenty of domestic fuel for continued growth, including diminished political uncertainty, very strong sentiment, ongoing job creation, and further strong global demand momentum, only slightly mitigated by the recent euro appreciation. However, slowing job creation, smaller improvement in the purchasing power of

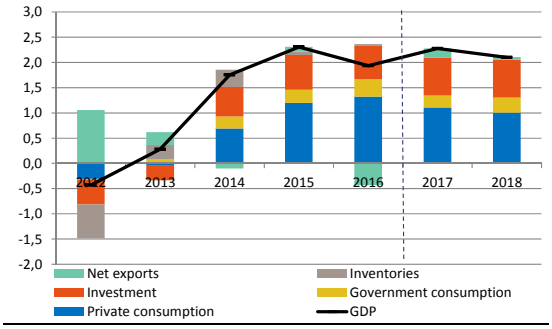
([1]) Among the different measures available, the shadow rate, as calibrated by McCoy and Clemens (2017), provide a good indication of the monetary stimulus provided by the ECB in a context of zero or even negative lower bound.

([2]) This impact was mentioned by ECB President Mario Draghi at the press conference on 9 December 2016 during the Q&A session.

households, and moderating investment growth suggest a moderation in the growth momentum to 2.1% in 2018 and to 1.8% in 2019 in both the euro area and the EU. Macroeconomic policies are set to remain supportive. Nevertheless, while the fiscal policy stance is set to remain broadly neutral, monetary policy is on a gradual road towards normalisation.

Growth has become increasingly broad-based across countries. For the first time since 2007, in 2015 and 2016 no Member State, apart from Greece, recorded negative growth figures. Over the forecast horizon, as from this year all Member States' economies are expected to grow. In particular, all economies with above-average growth between 2014 and 2016 are expected to enjoy further above-average growth over 2017-2019, with the exception of the UK. Nine Member States are expected to change their position relative to the average, whereas growth in France, Italy and Belgium, even though improving, is projected to still remain below average.

Graph I.1.3: **Real GDP growth and its components, EU**



Source: Commission autumn forecast 2017.

Private consumption is set to remain a key driver of growth. Private consumption gained some further momentum in the first half of 2017. Improved labour market conditions and corporate profits supported respectively higher labour and non-labour incomes. In turn, they sustained a strong acceleration in the nominal disposable income of households. Overall, in 2017 private consumption is forecast to continue growing, albeit at a slower pace than in the previous year. Over the next year, a projected slower employment growth is set to counterbalance some increase in wages and non-labour incomes, resulting in a stable growth in the nominal disposable income of households. On the back of only a modest uptick in inflation and a broadly stable households' saving ratio, private consumption growth should remain relatively steady next year before moderating in 2019. Generally, over the forecast horizon, private consumption is forecast to continue to contribute substantially to GDP growth, together with investment (Graph I.1.3).

Growth in investment is projected to remain sustained. Both investments in equipment and construction are expected to continue growing at a sustained pace, albeit with differences across Member States. In addition, while the construction investment-to-GDP ratio is set to remain well below its pre-crisis level, the equipment one hints at a full recovery. More generally, corporate investment is expected to be sustained by higher demand expectations, supportive financial conditions, diminished uncertainty, strong business sentiment, high capacity utilisation rates, and increasing corporate profitability as well as existing modernisation needs. In addition, deleveraging needs are gradually receding, market funding also continues to expand, and bank lending is expected to continue growing also thanks to a further easing in credit standards.

The euro area current account surplus is forecast to slightly diminish. After having increased to 3.3% in 2016, the current account surplus of the euro area is projected to marginally decline to around 3% of GDP in 2017 on the back of increased oil prices that are projected to contribute to a worsening in the terms of trade. Overall, the current account is expected to broadly stabilise over the forecast horizon. This is related to the fact that the projected solid export growth, driven by the rebound in global trade and ultimately in foreign demand, continues to be accompanied by a recovery in domestic demand. The impact of the recent euro appreciation should be small to the extent that the euro appreciation reflects an improved macroeconomic outlook and a greater attractiveness of the euro area for investment. The expected loss in market shares is only marginal inasmuch as exporters can largely absorb the appreciation in their profit margins.

Job creation is expected to continue, benefitting from the sustained domestic-demand driven expansion, albeit at a slowing pace. Employment growth is expected to remain strong in 2017, supported by the economic expansion. Over the

forecast horizon, employment growth is then set to continue at slightly lower pace mainly as a result of a combination of factors: the fading of temporary fiscal incentives in some Member States, skilled-labour supply shortages in some others, and a projected strengthening of labour productivity. Consequently, further declines in unemployment rates are expected to be somewhat lower as output gaps close. The euro area unemployment rate is projected at 8.5% in 2018. Despite these projected improvements, there is currently some remaining slack in the labour market (in terms of involuntary part-time and discouraged workers). ([3]) Since job creation is set to continue, the labour market slack that weighs on wage developments can be expected to diminish over the forecast horizon.

The outlook for euro-area inflation remains below the 2% threshold, mainly related to the projection of still muted producer prices and only moderate wage increases. Euro area inflation is forecast at 1.5% in 2017, up from 0.2% in 2016, mainly driven by the impact of positive energy base effects following the recovery of oil prices from their low levels in 2016. In 2017, core inflation (i.e. inflation extracting the impact of volatile energy and unprocessed food prices) remains subdued, mainly on the back of the lagged negative impact of a prolonged period of low inflation, remaining labour market slack and weak wage growth. However, it has been showing signs of a gradual recovery. Over the forecast horizon, headline inflation is projected to dip marginally in 2018 to 1.4% – dragged down still by some negative base effects in the energy and unprocessed food prices and by the euro's appreciation that is expected to lower import prices – and to slightly pick up in 2019 to 1.6%, consistent with a projected positive output gap.

Risks surrounding the economic outlook are broadly balanced, while mainly related to the changing policy context and geopolitical tensions. Downside risks are mainly on the external side in relation to elevated geopolitical tensions, and potentially tighter global financial conditions, such as from a stronger than assumed monetary tightening in the US or an increase in global risk aversion. In the medium term, external risks also relate to a possible setback in global trade integration as well as a disorderly adjustment in China. On the domestic side, depending on the outcome of the Brexit negotiations, the transition may not be as smooth as assumed. In addition, a faster-than-assumed removal of monetary stimulus or rise in interest rates would also pose significant challenges, especially in Member States more exposed to financial fragilities. This requires a prudent handling of fiscal policy. Upside risks comes mainly from the domestic side, in relation to diminishing uncertainty, improving sentiment and a stronger and more durable growth momentum. On the external side, the synchronous rebound outside Europe could also result in a more durable and stronger-than-expected expansion in the Union.

1.2. ASSESSMENT OF SHORT-TERM DEVELOPMENTS IN FISCAL BALANCE

1.2.1. Budget deficits

Over the five years up to 2016, deficits continued to fall on the back of the consolidation packages adopted in 2011-2013 and the strengthening economic recovery. The EU headline budget deficit fell by nearly 5 pps to 1.7% in 2016, from 6.4% in 2010, and by a broadly similar extent in the euro area too. Over the same period, the structural budget deficit (i.e. the headline budget deficit corrected for cyclical factors, one-offs and other temporary measures) declined by around 3 pps, to 1.3% in the EU and 0.9% in the euro area, in 2016. However, the improvement of the structural budget deficit has slowed down significantly since 2014, implying that the recent larger improvement recorded by the headline deficit has been driven mainly by the improving economic cyclical conditions (Table I.1.1). At country level, out of the 23 Member States with headline deficits above the 3% of GDP threshold in 2010, only two continued to exceed the threshold in 2016.

Looking ahead, the aggregate headline budget balance is expected to improve further in 2017 and 2018. In the euro area, the aggregate deficit is projected to decrease to 1.1% of GDP in 2017, more than expected in previous Commission forecasts, mainly reflecting the upward revision of economic growth.

([3]) European Commission (2017c), Box I.1.1.

Table I.1.1: **Budget balances in EU Member States (% of GDP)**

	Budget balance					Structural balance					Structural primary balance				
	2014	2015	2016	*2017*	*2018*	2014	2015	2016	*2017*	*2018*	2014	2015	2016	*2017*	*2018*
BE	-3,1	-2,5	-2,5	-1,5	-1,4	-2,9	-2,2	-2,1	-1,5	-1,5	0,3	0,8	0,7	1,1	0,8
DE	0,3	0,6	0,8	0,9	1,0	0,8	0,8	0,9	0,9	0,9	2,6	2,3	2,2	2,1	2,1
EE	0,7	0,1	-0,3	-0,2	-0,4	0,0	-0,1	-0,4	-1,1	-1,4	0,1	0,0	-0,4	-1,0	-1,4
IE	-3,6	-1,9	-0,7	-0,4	-0,2	-4,0	-2,1	-1,9	-1,3	-0,5	-0,1	0,6	0,4	0,8	1,3
EL	-3,6	-5,7	0,5	-1,2	0,9	2,5	2,1	5,3	2,5	3,3	6,5	5,7	8,5	5,7	6,3
ES	-6,0	-5,3	-4,5	-3,1	-2,4	-1,6	-2,5	-3,3	-3,1	-3,1	1,9	0,6	-0,5	-0,6	-0,8
FR	-3,9	-3,6	-3,4	-2,9	-2,9	-3,0	-2,7	-2,6	-2,4	-2,7	-0,8	-0,7	-0,7	-0,6	-1,0
IT	-3,0	-2,6	-2,5	-2,1	-1,8	-1,0	-0,8	-1,7	-2,1	-2,0	3,6	3,3	2,3	1,7	1,6
CY	-8,8	-1,2	0,5	1,1	1,4	3,3	1,6	1,1	0,4	0,0	6,1	4,4	3,6	2,8	2,2
LV	-1,2	-1,2	0,0	-0,9	-1,0	-1,0	-1,6	-0,6	-1,8	-1,8	0,4	-0,3	0,4	-0,8	-1,0
LT	-0,6	-0,2	0,3	0,1	0,2	-1,3	-0,6	-0,2	-0,9	-0,9	0,3	0,9	1,1	0,2	0,0
LU	1,3	1,4	1,6	0,5	0,3	2,0	1,7	2,0	0,6	0,3	2,4	2,1	2,3	0,9	0,6
MT	-1,8	-1,1	1,1	0,9	0,5	-3,0	-2,1	0,8	0,6	0,1	-0,3	0,4	3,0	2,5	1,9
NL	-2,3	-2,1	0,4	0,7	0,5	-0,4	-0,9	0,9	0,3	-0,2	1,1	0,4	2,0	1,3	0,6
AT	-2,7	-1,0	-1,6	-1,0	-0,9	-0,8	-0,3	-1,0	-0,9	-1,0	1,7	2,0	1,1	1,0	0,8
PT	-7,2	-4,4	-2,0	-1,4	-1,4	-1,7	-2,3	-2,0	-1,8	-1,8	3,2	2,3	2,2	2,1	1,8
SI	-5,3	-2,9	-1,9	-0,8	0,0	-2,3	-1,6	-1,5	-1,6	-1,6	1,0	1,7	1,6	1,0	0,4
SK	-2,7	-2,7	-2,2	-1,6	-1,0	-2,2	-2,3	-2,0	-1,6	-1,2	-0,3	-0,5	-0,3	-0,3	0,0
FI	-3,2	-2,7	-1,7	-1,4	-1,2	-1,5	-0,7	-0,4	-1,0	-1,4	-0,3	0,4	0,7	-0,1	-0,4
EA-19	-2,6	-2,1	-1,5	-1,1	-0,9	-1,0	-1,0	-0,9	-1,0	-1,1	1,6	1,4	1,2	1,0	0,8
BG	-5,5	-1,6	0,0	0,0	0,0	-1,6	-1,1	0,1	0,0	-0,2	-0,8	-0,2	1,0	0,9	0,7
CZ	-1,9	-0,6	0,7	1,2	0,8	-0,6	-0,6	0,9	0,8	0,4	0,7	0,5	1,8	1,6	1,1
DK	1,1	-1,8	-0,6	-1,0	-1,0	-0,8	-2,1	0,2	-0,5	-0,6	0,7	-0,5	1,6	0,7	0,4
HR	-5,1	-3,3	-0,9	-0,9	-0,9	-3,1	-1,8	-0,3	-0,9	-1,9	0,4	1,7	2,9	1,9	0,8
HU	-2,7	-2,0	-1,9	-2,1	-2,6	-2,6	-2,1	-2,0	-3,2	-3,6	1,3	1,4	1,2	-0,4	-1,0
PL	-3,6	-2,6	-2,5	-1,7	-1,7	-2,8	-2,3	-2,2	-2,1	-2,3	-0,8	-0,6	-0,5	-0,5	-0,8
RO	-1,4	-0,8	-3,0	-3,0	-3,9	-0,4	-0,3	-2,2	-3,3	-4,3	1,2	1,3	-0,7	-1,8	-2,7
SE	-1,6	0,2	1,1	0,9	0,7	-0,3	0,4	1,1	0,8	0,6	0,4	0,8	1,5	1,1	0,9
UK	-5,5	-4,3	-2,9	-2,1	-1,9	-5,0	-4,4	-3,3	-2,5	-2,2	-2,4	-2,1	-0,8	0,2	0,3
EU-28	-3,0	-2,4	-1,7	-1,2	-1,1	-1,7	-1,6	-1,3	-1,2	-1,3	0,8	0,7	0,9	0,8	0,6

Note: The structural budget balance is calculated on the basis of the commonly agreed production function method (European Commission (2004)).
Source: Commission autumn forecast 2017.

The headline deficit is then set to decline further to 0.9% in 2018, after incorporating policy measures from the 2018 Draft Budgetary Plans. A parallel reduction is expected in the EU as a whole, to 1.2% in 2017 and 1.1% in 2018. However, the structural balance is projected to remain broadly stable at around -1% of potential GDP in 2017 and 2018 (only marginally expanding by 0.1 pp) in the euro area and to hover at around -1.3% in the EU as a whole.

The main driver of the current and projected improvement in the headline budget balance lies in the improving cyclical conditions based on favourable developments of private demand. Several factors contribute to the projected decline in the euro area general government balance over 2017-2018, as shown in Table I.1.2. The main driver is expected to be the change in the cyclical component of the budget, i.e. the budgetary impact of economic growth outpacing potential growth.

More specifically, the cyclical component is set to provide a positive contribution of around 0.4pp of GDP in 2017, which should marginally drop to 0.3pp in 2018. Moreover, with interest rates remaining at historical lows, the reduction in interest expenditure will continue to support the decline in the general government balance over 2017-2018, albeit more moderately than in previous years. By contrast, a negative contribution is expected from slightly worsening structural primary balances in both 2017 and 2018, given the lack of fiscal adjustment at the aggregate level.

The fiscal policy orientation was differentiated across Member States in 2016. The fiscal effort in 2016, as measured by the change in the structural balance, shows six Member States out of the 28 loosening fiscal policy while in the others fiscal policy was tightened or neutral. Half of the Member States tightened their fiscal policy in a range of 0 and 1pp while eight Member States tightened fiscal policy by at least 1pp of GDP. Among those loosening, only Romania loosened its fiscal policy by more than 1pp of GDP, while all other five Member States loosened in a range of 0 and 1pp of GDP.

Table I.1.2: **Euro area - Breakdown of the general government budget balance (% of GDP)**

	2013	2014	2015	2016	2017	2018
Total revenue (1)	46,7	46,7	46,2	46,1	46,1	45,9
Total expenditure (2)	49,8	49,2	48,3	47,6	47,2	46,8
Actual balance (3) = (1) - (2)	-3,0	-2,6	-2,1	-1,5	-1,1	-0,9
Interest (4)	2,8	2,6	2,4	2,2	2,0	1,9
Primary balance (5) = (3) + (4)	-0,2	0,1	0,3	0,6	0,9	1,0
One-offs (6)	-0,1	-0,2	-0,2	0,0	0,1	0,0
Cyclically adjusted balance (7)	-1,4	-1,2	-1,1	-0,9	-0,9	-1,1
Cyclically adj. prim. balance = (7) + (4)	1,4	1,4	1,3	1,3	1,1	0,8
Structural budget balance = (7) - (6)	-1,3	-1,0	-1,0	-0,9	-1,0	-1,1
Structural primary balance = (7)-(6)+(4)	1,5	1,6	1,4	1,2	1,0	0,8
Change in actual balance:		**0,5**	**0,5**	**0,5**	**0,4**	**0,2**
of which - Cycle		0,3	0,4	0,33	0,45	0,3
- Interest (reverse sign)		0,2	0,3	0,2	0,1	0,1
- One-offs		-0,1	0,1	0,2	0,0	-0,1
- Structural primary balance		0,2	-0,2	-0,2	-0,2	-0,2
Change in cycl. adj. primary balance		0,0	-0,2	0,0	-0,2	-0,3
Change in structural budget balance		0,3	0,0	0,0	-0,1	-0,1

Note: Differences between totals and sum of individual items are due to rounding.
Source: Commission services; for 2017 and 2018: Commission autumn forecast 2017.

Over 2017-2018, most Member States are expected to make their fiscal policy less restrictive. The vast majority of Member States is set to loosen fiscal policy over 2017-2018, with the largest expected loosening occurring in Romania by 2.3pps over the two years. Greece's structural balance is also expected to deteriorate in view of the large over-performance of the 2016 primary surplus target, the policy commitments agreed for 2017 and 2018 under the Stability Support Programme and a projected gradual closure of the output gap. Consolidation is expected to take place in eight Member States over the two years, with a maximum tightening of the structural balance of 1.4pps of GDP in Ireland over the two years. However, in several Member States, those averages conceal significant differences in the fiscal policy orientation between the two years.

1.2.2. Assessing the euro area's fiscal stance

Reflecting the country developments, the euro area fiscal policy stance was on average broadly neutral between 2014 and 2016. After a period of significant fiscal retrenchment, the fiscal stance ([4]) in the euro area, as measured by the change in the structural balance, turned broadly neutral in 2015 and in 2016. Over 2015-2016, the fiscal stance was rather differentiated across Member States: it was on average broadly neutral in Germany, Luxembourg and Slovakia, it loosened in six Member States while it was still contractionary, to differing extents, in ten Member States.

In 2017 and 2018, the fiscal stance is projected to continue being broadly neutral, based on only marginally deteriorating structural balances. The discretionary fiscal effort, ([5]) an alternative indicator to assess the fiscal policy stance, signals a slightly expansionary stance in 2017 and a broadly neutral one in 2018. ([6]) For 2017, euro area primary expenditure, net of one-offs and cyclical unemployment benefits, is projected to increase by more than nominal potential growth. This implies additional spending in 2017 – compared to neutral spending developments based on potential growth – that is projected to be only partly offset by additional structural discretionary revenues. For 2018, primary expenditure, net of one-offs and cyclical unemployment benefits, is projected to increase only marginally more than nominal potential growth. No new discretionary measures are foreseen on the revenue side, overall leading to a broadly neutral stance.

Monetary policy was accommodative when fiscal consolidation took place. The policy mix in the euro area reflects the interaction between monetary and fiscal policies, proxies for whose respective orientations can be identified in the evolution of financing conditions (e.g. real long-term interest rate) and fiscal efforts (e.g. discretionary fiscal effort). As shown in Graph I.1.4, ([7]) financing conditions eased substantially between 2011 and 2012, thanks to the

([4]) Usually, the fiscal stance refers to the orientation of fiscal policy, which can be qualified as expansionary, restrictive or neutral. In this section, a neutral stance is one where government discretionary decisions, essentially the growth of (primary) spending and the new tax measures, neither support nor drag on the private economy compared with a steady state path.

([5]) For further details, see Carnot and de Castro (2015).

([6]) The Commission autumn forecast 2018 incorporates the Draft Budgetary Plans submitted by the euro area Member States. However, Austria, Germany, and Spain submitted their plans on the basis of a no-policy-change scenario.

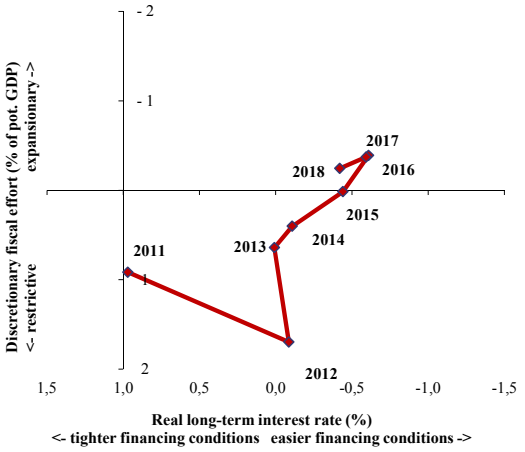
([7]) The graph refers to a time period characterised by a negative output gap for the euro area aggregate, expected to close only in 2018. When the discretionary fiscal effort is positive/negative, fiscal policy is considered expansionary/restrictive. Regarding financing conditions, a real long-term interest rate of 1% is here considered to be the natural rate in line with potential growth over the forecast horizon. A decrease/increase in the real long-term interest rate corresponds to an easing/tightening of financing conditions.

ECB's intervention in response to the crisis. Financing conditions then continued easing after 2013, but to a lesser extent. In fact, while the ECB managed to exert downward pressure on nominal long-term interest rates with its additional measures, long-term inflation expectations also declined and only started to pick up towards the end of 2016. Financing conditions are expected to turn less loose in 2018, when the euro area output gap is finally projected to close. More specifically, in 2018 average real long-term rates ([8]) are expected to increase somewhat, as the gradual increase in nominal rates is not set to be accompanied by a corresponding pick-up in inflation expectations further out. However, financing conditions should remain very supportive overall.

In light of the current economic recovery, which is strengthening but remains incomplete and atypical, a broadly neutral fiscal stance continues to appear appropriate for the euro area as a whole in 2018. The orientation of the fiscal position needs to be assessed against the double objective of long term sustainability and the short term macroeconomic stabilisation. The broadly neutral fiscal stance that emerges from the 2017 Commission autumn forecast, incorporating the Draft Budgetary Plans submitted by the euro area Member States, appears appropriate in a context of a strengthening economic recovery that remains incomplete and atypical, and of monetary policy on a gradual road towards normalisation. Nonetheless, an aggregate broadly neutral fiscal stance hides in itself a differentiated fiscal stance at country level, which can be favoured by cross-country spill-overs. In fact, in such a context, Member States in need of consolidation can do so at a lesser cost. ([9])

The sustainability of public finances needs to be ensured over the medium and long term. In terms of country contributions to the aggregate fiscal stance in 2018, a majority of euro area Member States is projected to have a slightly expansionary fiscal stance, in terms of the change in the structural balance, combined with a positive output gap. At the same time, there is no clear-cut relation between the expected fiscal effort (as per the change in the structural balance) and the level of debt-to-GDP ratios across Member States. In fact, the expected fiscal adjustment is relatively limited or even negative for some high-indebted Member States. The accumulation of public debt is historically unprecedented (outside of war episodes). Therefore, in the future, further fiscal effort may be needed in Member States characterised by high debt-to-GDP ratios, especially in case of persistently moderate growth prospects and, given their current historically low levels, rising interest rates.

Graph I.1.4: **Real long-term interest rate and discretionary fiscal effort, euro area**



Source: Commission services.

1.3. DEVELOPMENTS IN DEBT

The improved outlook for nominal GDP growth and historically low interest rates is set to support the decline in the debt-to-GDP ratio. The general government debt-to-GDP ratio of the euro area has been on a slow declining path since 2014, when it reached a peak of 94.2% (88.2% in the EU). The debt ratio is expected to follow the downward trend, falling to 89.3% of GDP (83.5% in the EU) in 2017 and to edge further down to 87.2% (81.6% in EU) in 2018 (Table I.1.3). The expected decline in the debt ratio in 2017 and 2018 is equally driven by two main factors, namely an improvement in the primary balance and the snowball effect, which combines the impact of lower interest expenditure and higher nominal

([8]) Long-term interest rates are derived from the 10-year swap rate deflated by inflation expectations.
([9]) For more details, see European Commission (2017b).

Table I.1.3: **Composition of changes in the government debt ratio in Member States (% of GDP)**

	Gross debt ratio							Change in debt ratio	Change in the debt ratio in 2016-18 due to:		
	2012	2013	2014	2015	2016	*2017*	*2018*	2016-18	1. Primary balance	2. Interest & growth	3. Stock-flow adjustment
BE	104,3	105,5	106,8	106,0	105,7	103,8	102,5	-3,2	-2,0	-2,2	1,0
DE	79,8	77,4	74,6	70,9	68,1	64,8	61,2	-6,1	-4,3	-2,6	0,0
EE	9,7	10,2	10,7	10,0	9,4	9,2	9,1	-0,8	0,6	#N/A	0,3
IE	119,6	119,4	104,5	76,9	72,8	69,9	69,1	-7,0	-3,3	-3,2	2,8
EL	159,6	177,4	179,0	176,8	180,8	179,6	177,8	2,7	-6,0	-4,2	7,1
ES	85,7	95,5	100,4	99,4	99,0	98,4	96,9	-1,0	0,7	-2,9	0,2
FR	89,6	92,4	95,0	95,8	96,5	96,9	96,9	1,2	2,2	-1,8	0,0
IT	123,4	129,0	131,8	131,5	132,0	132,1	130,8	0,6	-3,5	1,5	0,8
CY	79,7	102,6	107,5	107,5	107,1	103,0	98,3	-4,5	-7,1	-4,2	2,5
LV	41,2	39,0	40,9	36,9	40,6	39,0	35,5	2,1	0,2	-3,4	-1,9
LT	39,8	38,8	40,5	42,6	40,1	41,5	37,9	-1,1	-2,4	-3,4	3,6
LU	22,0	23,7	22,7	22,0	20,8	23,7	23,0	1,7	-1,4	-1,9	5,5
MT	67,8	68,4	63,8	60,3	57,6	54,9	51,6	-5,4	-5,1	-4,1	3,2
NL	66,3	67,8	68,0	64,6	61,8	57,7	54,9	-6,8	-3,0	-3,1	-0,8
AT	81,7	81,0	83,8	84,3	83,6	78,6	76,2	-5,7	-1,7	-2,9	-2,7
PT	126,2	129,0	130,6	128,8	130,1	126,4	124,1	-2,4	-4,6	-1,8	0,4
SI	53,8	70,4	80,3	82,6	78,5	76,4	74,1	-6,2	-3,7	-4,4	3,6
SK	52,2	54,7	53,5	52,3	51,8	50,6	49,9	-1,7	0,1	-2,6	0,6
FI	53,9	56,5	60,2	63,6	63,1	62,7	62,1	-0,9	0,7	-3,0	1,3
EA-19	91,4	93,7	94,2	92,1	91,1	89,3	87,2	-2,9	-1,9	-2,2	0,3
BG	16,7	17,0	27,0	26,0	29,0	25,7	24,3	-0,3	-1,8	-0,9	-2,0
CZ	44,5	44,9	42,2	40,0	36,8	34,6	33,3	-5,4	-3,5	-2,2	2,3
DK	44,9	44,0	44,0	39,5	37,7	36,1	35,5	-3,4	-0,3	-0,5	-1,4
HR	70,7	81,7	85,8	85,4	82,9	80,3	77,4	-5,2	-3,7	-1,8	0,1
HU	77,6	76,0	75,2	74,7	73,9	72,6	71,5	-2,2	-0,8	-3,6	2,1
PL	53,7	55,7	50,2	51,1	54,1	53,2	53,0	2,1	0,5	-3,2	1,6
RO	37,3	37,8	39,4	37,9	37,6	37,9	39,1	0,0	3,9	-2,4	0,0
SE	38,1	40,8	45,5	44,2	42,2	39,0	36,6	-5,2	-2,3	-3,4	0,0
UK	84,5	85,6	87,4	88,2	88,3	86,6	85,3	-1,6	-1,1	-0,9	-1,0
EU-28	85,2	87,3	88,2	86,1	84,8	83,5	81,6	-2,6	-1,6	-1,2	-0,3

Note: Differences between the sum and the total of individual items are due to rounding.
Source: Commission services.

GDP growth. In particular, the average nominal GDP growth over 2017-2018 is projected to outpace the average implicit interest rate paid on debt, ultimately helping to reduce the debt ratio. Stock-flow adjustments play at the margin, instead, with a debt-increasing contribution in the euro area and a debt-decreasing one in the EU as whole.

The debt-to-GDP ratios are projected to be on a downward path in almost all Member States, but debt levels continue to vary significantly. Over 2017-2018, the debt-to-GDP ratio is projected to decline in all Member States, other than Luxemburg (23% in 2018), Romania (39.1%), and France (96.9%). The reduction in the debt ratio is expected to be supported by debt-decreasing snowball effects in all Member States except Italy. In 2018 the debt-to-GDP ratio is set to remain above 100% in four Member States (Belgium, Greece, Italy and Portugal), and above 90% in three other Member States (Spain, France and Cyprus). There are eight Member States with debt between 60% and 90%, while the remaining thirteen are expected to be below the 60% of GDP threshold in 2018.

High government debt is problematic for an economy. The literature confirms that high government debt may constitute a drag on growth and on the recovery. ([10]) Moreover, high debt Member States are more subject to tensions in financial markets, which can put them more easily under stress from exogenous interest rate shocks.

1.4. COMPOSITION OF PUBLIC FINANCES

Between 2013 and 2016, the reduction in the headline budget deficit-to-GDP ratio was driven by a larger fall in the expenditure ratio as compared to the marginal drop in the revenue

([10]) See Chudik et al. (2017) and Jordà et al. (2016).

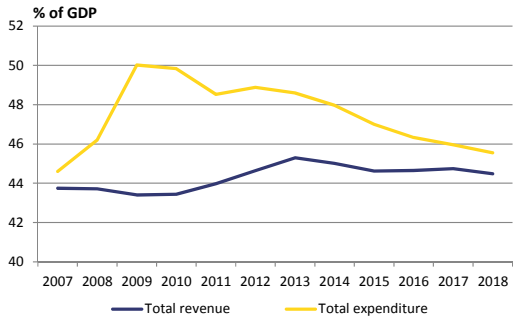
ratio. In the EU, the expenditure-to-GDP ratio decreased by 2.3pps, from 48.6% in 2013 to 46.3% in 2016 (Table I.1.4). Around one-fourth of that decline is explained by lower interest expenditure. Over the same period, revenues fell only by a half pp to 44.7%. In the euro area, a similar trend is observed. Expenditures declined by 2.2pps to 47.6% in 2016 while revenues fell by a half pp to 46.1%. This follows the period between 2011 and 2013, when the fiscal consolidation conducted was driven mainly by revenue increases, in particular in the euro area. In the EU as a whole, the revenue to-GDP ratio increased by almost two pps from 43.5% in 2010 to 45.4% in 2013 despite the operation of automatic stabilisers (see Part III). The expenditure-to-GDP ratio fell by slightly more than a pp from 49.9% to 48.7%. In the euro area, the revenue-to-GDP ratio increased by more than two pps from 44.3% in 2010 to 46.7% in 2013 while the expenditure-to-GDP ratio fell by less than a pp from 50.5% to 49.7%. This may also partly reflect a longer time-span needed to see the effects of spending containment.

Over 2017-2018, a further decline in the expenditure ratio is expected to drive the improvement in the headline budget balance. The reduction in the general government deficit-to-GDP ratio is expected to be driven by a larger fall in the expenditure ratio as compared to the drop in the revenue ratio in both the euro area and EU as a whole (Graph I.1.5). The expenditure-to-GDP ratio in the EU is set to decline by 0.8pp to 45.5% in 2018 (46.8% in the euro area), while the revenue-to-GDP ratio is set to decline only marginally, to 44.5% in 2018 (45.9% in the euro area). Part of the decline in the expenditure-to-GDP ratio is explained by lower interest expenditure, which is set to fall by 0.2pp of GDP, from 2.1% of GDP in 2016 to 1.9% in 2018. The other part of the decline in the expenditure ratio is mainly explained by improving cyclical conditions. Notably, actual GDP is forecast to grow more than potential GDP over 2017-2018, thus entailing a dampening impact on the expenditure-to-GDP ratio, other things being equal. At the same time, as labour markets are set to improve, lower unemployment benefits will also contribute to the reduction in the expenditure ratio over the forecast period.

The euro area aggregate trend reflects broadly-based developments in the Member States. The expenditure ratio is projected to decline over 2017–2018 in all euro area Member States except for Estonia, where it remains stable, and Latvia and Luxembourg, where only a marginal increase is expected. The revenue ratio is also projected to decline over 2017-2018 in the majority of euro area Member States except for Germany, France and the Netherlands, where remains stable, and Spain, Cyprus and Portugal, where it increases. The trends are more heterogeneous among non-euro area Member States. In fact, both the revenue and expenditure ratios are projected to decline over 2017-2018 in three non-euro area Member States. In Hungary, while the revenue ratio is expected to fall, the expenditure one is set to increase. For the remaining five, both revenue and expenditure ratios are expected to increase over 2017-2018. Overall, the expected cumulated change in the expenditure ratio ranges from a 3.4pps fall in Finland to a 2.8pps increase in Romania. Similarly, the expected cumulated change in the revenue ratio ranges from a 2.9pps fall in Finland to a 1.5pps increase in Bulgaria.

Most of the decline in the revenue ratio appears to be of a structural nature, while this is only marginally the case on the expenditure side. Looking at the projected change from 2016 to 2018, the slight drop in the structural revenue ratio is broadly in line with the change in nominal terms both with respect to the EU and the euro area aggregates, the difference being explained by modest expansionary tax measures.

Graph I.1.5: **Trends in revenue and expenditure since the crisis (% of GDP)**



Source: Commission services; for 2017 and 2018: Commission autumn forecast 2017.

On the expenditure side, however, only a minimal 0.1pp of the decline in the ratio in the EU and none in the euro area is estimated to be structural. This reflects the diverse nature of the main factors

Table I.1.4: **Government revenue and expenditure (% of GDP)**

	Revenue							Expenditure						
	2012	2013	2014	2015	2016	*2017*	*2018*	2012	2013	2014	2015	2016	*2017*	*2018*
BE	51,6	52,7	52,1	51,3	50,7	50,9	50,3	55,9	55,8	55,2	53,8	53,2	52,4	51,8
DE	44,3	44,5	44,6	44,5	45,0	45,1	45,0	44,3	44,7	44,3	43,9	44,2	44,2	44,0
EE	39,0	38,3	39,1	40,3	40,3	40,1	40,2	39,3	38,5	38,4	40,2	40,6	40,3	40,7
IE	33,9	34,1	33,9	26,9	26,4	26,0	25,9	41,9	40,2	37,5	28,8	27,1	26,4	26,0
EL	46,5	49,0	46,6	48,1	50,2	49,2	48,3	55,4	62,2	50,2	53,8	49,7	50,4	47,4
ES	37,6	38,6	38,9	38,5	37,7	37,9	38,0	48,1	45,6	44,8	43,8	42,2	41,1	40,4
FR	52,0	52,9	53,1	53,1	53,0	53,1	53,0	56,8	57,0	57,1	56,7	56,4	56,0	55,9
IT	47,8	48,1	47,9	47,7	46,9	47,0	46,7	50,8	51,1	50,9	50,2	49,4	49,1	48,5
CY	36,1	36,4	39,5	39,0	38,8	39,6	39,6	41,6	41,6	48,2	40,2	38,3	38,5	38,2
LV	36,8	36,8	37,1	37,3	37,4	37,3	36,7	38,0	37,7	38,3	38,5	37,4	38,2	37,7
LT	33,0	32,9	34,0	34,6	34,5	34,5	34,3	36,1	35,5	34,6	34,9	34,2	34,4	34,0
LU	44,4	44,3	43,1	42,8	43,8	43,3	43,0	44,1	43,3	41,8	41,5	42,1	42,8	42,6
MT	39,3	39,5	39,6	40,1	39,2	39,0	38,1	42,7	42,0	41,3	41,2	38,0	38,1	37,6
NL	43,2	43,9	43,9	42,8	43,8	43,9	43,8	47,1	46,3	46,2	44,9	43,4	43,2	43,3
AT	49,0	49,7	49,6	49,9	49,1	48,8	48,3	51,2	51,6	52,3	51,0	50,7	49,8	49,2
PT	42,9	45,1	44,6	43,8	43,0	43,4	43,2	48,5	49,9	51,8	48,2	45,0	44,8	44,6
SI	44,5	44,8	44,3	44,9	43,3	42,8	42,5	48,5	59,5	49,6	47,7	45,1	43,6	42,5
SK	36,3	38,7	39,3	42,5	39,3	38,9	38,2	40,6	41,4	42,0	45,2	41,5	40,6	39,2
FI	54,0	54,9	54,9	54,2	54,0	52,5	51,1	56,2	57,5	58,1	56,9	55,8	53,9	52,3
EA-19	46,1	46,7	46,7	46,2	46,1	46,1	45,9	49,7	49,8	49,2	48,3	47,6	47,2	46,8
BG	34,1	37,2	36,6	39,1	34,9	36,2	36,4	34,5	37,6	42,1	40,7	35,0	36,2	36,4
CZ	40,5	41,4	40,3	41,1	40,1	40,4	40,4	44,5	42,6	42,2	41,7	39,4	39,2	39,5
DK	54,5	54,6	56,4	53,1	52,9	52,0	51,5	58,0	55,8	55,3	54,8	53,5	53,0	52,4
HR	42,1	42,4	42,9	44,3	46,3	45,4	44,9	47,3	47,7	48,0	47,6	47,2	46,3	45,8
HU	46,1	46,6	46,8	48,2	44,8	45,5	44,6	48,5	49,3	49,5	50,2	46,7	47,5	47,2
PL	39,1	38,5	38,7	38,9	38,7	39,5	39,9	42,9	42,6	42,3	41,6	41,2	41,3	41,6
RO	33,6	33,3	33,5	34,9	31,0	30,8	31,7	37,2	35,4	34,9	35,7	34,0	33,8	35,5
SE	50,4	50,6	49,6	49,8	50,6	49,7	48,9	51,4	52,0	51,1	49,6	49,5	48,8	48,2
UK	37,8	38,8	37,7	38,1	38,6	38,9	38,4	46,0	44,2	43,2	42,4	41,5	41,0	40,3
EU-28	44,6	45,3	45,0	44,6	44,7	44,7	44,5	48,9	48,6	48,0	47,0	46,3	46,0	45,6

Note: Differences between the sum and the total of individual items are due to rounding.
Source: Commission services.

driving the expenditure ratio, namely the impact of the economic recovery on automatic stabilisers and lower interest expenditure.

In terms of composition of public spending, the decline in the expenditure ratio is driven by current expenditure. Public investment is expected to benefit from the implementation of the 2014-2020 programming period of EU funding as well as from the Investment Plan for Europe. Nonetheless, the ratio of public investment to GDP of the EU aggregate is projected to increase only marginally over the forecast horizon (to 2.6% in 2018, from 2.5% in 2016) and thus remain below its pre-crisis average (3.2% of GDP over 2000-2007).

In terms of composition of public revenues, reported tax expenditures add up to a non-negligible share of GDP in many Member States. Tax expenditures are reductions in government revenue through preferential tax treatment of specific groups of tax payers or specific economic activities. According to Kalyva et al. (2014), the sum of all tax expenditures as a percentage of GDP could amount to from 2% up to 4% of GDP in some Member States. Nevertheless, in about half of the Member States that report those figures ([11]) tax expenditures as a percentage of GDP stand below 1% of GDP. The objectives of tax expenditures often include employment creation, innovation, education, entrepreneurship, home ownership and income redistribution. However, tax expenditures are not necessarily the most cost-efficient instrument to achieve those objectives and may in some cases lead to severe economic impacts and distortions. Cost-benefit analysis and in-depth reviews are warranted in many cases to enhance the efficiency of the overall revenue system. Box I.1.1 recalls the importance of reporting tax expenditures and provide an updated overview of the current reporting in Member States.

([11]) For the limitations of the measure indicated and the limited sample of countries where data are available see also OECD (2010).

Box I.1.1: **National reporting on tax expenditures and characteristics of regular reporting practices**

Tax expenditures are reductions in government revenue through preferential tax treatment of specific groups of tax payers or specific economic activities. EU Member States make ample use of tax expenditures with a wide variety of aims including employment creation, innovation, education, entrepreneurship, home ownership and income distribution. While tax expenditures may be motivated by relevant economic or social goals, they are not necessarily the most cost-efficient instrument and may in some cases lead to severe economic impact and distortions (European Commission (2014)).

The European Commission and other international organisations ([1]) regularly emphasise the need to report on and review tax expenditures as part of national budget management given their implication on fiscal consolidation as well. In this line, governments should describe clearly the use of tax expenditures in their tax systems, and provide an explanation of the main policies in place. This should include defining the benchmark situation (from which the tax expenditure is a deviation), the estimated cost of the measure in lost revenue and its coverage. In addition to reporting tax expenditures in the budget, governments should also carry out regular evaluations of the tax expenditures they apply. The evaluations may be conducted by independent bodies or commissions, if this is thought more appropriate, and should assess the efficiency and cost effectiveness of current tax expenditures. Member States may choose to carry out more extensive evaluations on a less frequent basis (i.e. less than once a year).

In this context, under the EU Directive on requirements for budgetary frameworks (2011/85/EU), Member States have been required since 1 January 2014 to publish detailed information on the effect of tax expenditures on revenue (Article 14(2)). However, the Directive does not specify a standardised procedure for evaluating tax expenditures.

The analysis presented in Table I.1.a provides an updated overview of the current reporting on tax expenditures in EU Member States (based primarily on European Commission (2016)). Table I.1.a shows in which Member States reporting on tax expenditures is required under national law, and also gives further detail on the coverage of national reporting: the time period reported on and the categorisation of tax expenditures used. The information provided shows that in 2016, 23 Member States now regularly report on tax expenditures. Reporting practices do, however, vary widely across countries, and the reports produced therefore also vary, in terms of their presentation, depth and coverage.

In 2016, a national legal requirement to report on tax expenditures was in place in 19 of the 23 Member States that currently report regularly. Moreover, there are a few Member States, where the legal obligation was laid down or is likely to be adopted (e.g. HR, CY), but the regular practice has yet to be established. Reporting on tax expenditures varies in terms of the levels of government covered. While tax expenditures administered by central government are always covered, those related to local taxes and social security funds appear to be generally less well documented mainly due to the heterogeneity of the taxes applied (European Commission (2015)). Member States' reporting practices do, however, share some general common features:

a) Reporting is typically carried out on an annual basis, by the Ministry of Finance, the Ministry for the Economy or the tax authorities, or by services reporting to one of these. b) tax expenditures are most often identified in reference to their tax category or tax base c) expenditures are often grouped according to the type of tax measure (e.g. allowances, rate relief or exemptions), the purpose (e.g. supporting low-income earners or reducing the tax on certain types of housing) or the sector (e.g. households, businesses or agriculture).

([1]) See, e.g., IMF (2011), OECD (2010) and European Commission (2015). For a more detailed discussion, see Bauger (2014).

(Continued on the next page)

Box (continued)

However, the time period covered and the categorisation ([2]) of tax expenditures used varies greatly. Similarly, some countries' reporting is backward-looking and others' forward-looking. d) the reports generally use the "revenue forgone" method for calculating tax expenditures, but there are significant differences in methodology (e.g whether revenue is estimated on a cash or accruals basis). e) some Member States link tax expenditures to the expenditure side of the budget and the relevant reports are discussed in the Parliament (e.g. Belgium, Denmark, Germany, Greece, Spain, France, Austria, Portugal and Finland).

Table I.1.a: **National reporting on tax expenditures and characteristics of regular reporting practices**

Country	Legal requirement	National reporting		Time coverage	Categorization
		Regular (annual)	Non-regular (latest)		
BE	X	X		t-5, t-4, t-3, t-2, t-1	tax base, purpose
BG	X	X	2012		
CZ			2015		
DK	X	X	2009	various years	tax base
DE	X	X	2009	t-2, t-1, t, t+1	tax base, type of tax measure, purpose, sector
EE		X		t, t+1	tax base, purpose
IE	X	X	2010	t-1, t	type of tax measure
EL	X	X		t-2	tax base, purpose, sector
ES	X	X		t+1	tax base, type of tax measure, expenditure category
FR	X	X	2011	t-1, t, t+1	tax base, expenditure category
IT	X	X	2010/11	t, t+1, t+2	type of tax measure, purpose, sector
NL	X	X		t-2, t-1, t, t+1, t+2, t+3, t+4	tax base, sector, law, policy area
AT	X	X		t-3, t-2, t-1	tax base, sector
PT	X	X		t-2, t-1, t, t+1	tax base, purpose
SK	X	X		t-2, t-1, t, t+1, t+2, t+3	tax base
FI		X	2010	t-1, t, t+1	tax base, purpose
LV	X	X		t-2, t-1	tax base
LU	X	X		t	type of tax measure
LT	X	X		t+1	purpose
RO	X	X		t-1, t, t+1, t+2	tax base
HU	X	X		t+1	tax base
PL		X		t-1	tax base, purpose
SE	X	X		t-1, t+1, t+2	tax base, type of tax measure, purpose/sector (expenditure category or technical tax expenditure)
UK		X		t-1, t	tax base
BE	X	X		t-5, t-4, t-3, t-2, t-1	tax base, purpose
BG	X	X	2012		
CZ			2015		
DK	X	X	2009	various years	tax base

Source: Commission services based on national sources.

([2]) ESA 2010 introduces explicit new rules on how tax credits are to be recorded in national accounts. This is a significant change from the method previously used under ESA 95. Tax credits that constitute non-contingent government liabilities are now treated as expenditure instead of as a reduction in tax revenue, and are recorded at the moment when a government recognises the obligation to pay. The new system of recording on a gross (rather than a net) basis leads to an increase in total revenue and in total expenditure, compared to the approach used in the past.

(Continued on the next page)

Box (continued)

Finally, some Member States have also recently produced one-off tax expenditure reviews or inventories. These reports are generally more extensive, produced in some cases by independent experts (e.g. in Denmark, Ireland Finland, and UK) and may include reviews of or opinions on specific tax expenditure items.

Overall, information on the tax expenditures in force or planned in Member States is still often incomplete, and the data provided are not fully comparable across countries and over time. This makes it more difficult to identify possible improvements to fiscal and tax arrangements, and can thus make fiscal policymaking less effective and efficient. This can, in turn, affect the strength of countries' national budgetary frameworks as – more or less hidden – losses of revenue may weaken the positive effect to be gained from new measures increasing transparency on the expenditure side. National provisions adopted to transpose the EU Directive on requirements for budgetary frameworks (2011/85/EU) and the changes that entered into force under the current European System of Accounts (ESA 2010) have already improved budgetary transparency, which is expected to strengthen further by the rigorous implementation of these measures.

2. IMPLEMENTATION OF FISCAL SURVEILLANCE

The EU fiscal framework, as laid down by the Stability and Growth Pact (SGP), aims at ensuring budgetary discipline through two main requirements. First, Member States are required to keep their general government deficit and debt positions below the reference values of 3% and 60% of GDP respectively, and to prompt their correction if those two criteria are temporarily not fulfilled. ([12])([13]) Second, they are required by the preventive arm of the SGP to achieve and maintain their medium-term budgetary objective (MTO), which corresponds to a cyclically-adjusted target for the budget balance, net of one-offs and temporary measures. ([14]) Country-specific MTOs are defined so as to secure the sustainability of public finances and allow the automatic stabilisers to operate without breaching the reference value for the deficit as defined in the Treaty.

2.1. THE EXCESSIVE DEFICIT PROCEDURE

The Excessive Deficit Procedure (EDP) ensures that Member States correct their excessive deficit and debt positions, measured against the reference values of 3% and 60% of GDP, thus operationalising the requirements set in the Treaty. ([15]) This section focuses on the implementation of the EDP since the previous Report on Public Finances was published. The country-specific developments are summarised in Tables I.A1.1, to I.A1.4. ([16])

Currently, only two Member States remain in EDP (France and Spain). According to the Commission autumn forecast 2017, only Spain would have a deficit above 3% of GDP at the end of 2017.

2.1.1. Euro area Member States

The Commission adopted reports in accordance with Article 126(3) TFEU for Italy on 22 February 2017 and for Belgium and Finland on 22 May 2017.

In the case of Italy, the Commission concluded on 22 February 2017 based on notified data for 2015 and the 2017 Commission winter forecast that the debt criterion as defined in the Treaty should be considered as not complied with at that stage. Gross government debt reached 132.3% of GDP in 2015, well above the 60% Treaty reference value, and Italy did not make sufficient progress towards compliance with the debt reduction benchmark in 2015. Moreover, Italy was not projected to comply with the debt rule

([12]) Article 126 TFEU lays down the Excessive Deficit Procedure, which is further specified in Council Regulation (EC) 1467/97 "on speeding up and clarifying the implementation of the excessive deficit procedure", amended in 2005 and 2011, which represents the corrective arm of the SGP.
Relevant legal texts and guidelines can be found at:
https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/stability-and-growth-pact/legal-basis-stability-and-growth-pact_en

([13]) In particular, a Member State is not compliant with the debt criterion if its general government gross debt is greater than 60% of GDP, and it is not sufficiently diminishing and approaching 60% of GDP at a satisfactory pace.

([14]) The preventive arm of the SGP is contained in Council Regulation (EC) 1466/97 "on the strengthening of the surveillance of budgetary positions and the surveillance and coordination of economic policies", which was amended in 2005 and 2011. Together with the procedure for the avoidance of excessive government deficit laid down in Article 126 TFEU, further specified in Council Regulation (EC) 1467/97, in European Parliament and Council Regulation (EU) No 1175/2011, Council Regulation (EU) No 1177/2011 and Regulation (EU) No 1173/2011 on the effective enforcement of budgetary surveillance in the euro area, form the SGP.

([15]) The concept of *"sufficiently diminishing"* and *"satisfactory pace"* is crucial in the assessment of compliance with the debt criterion for Member States whose general government gross debt is greater than 60% of GDP. Those requirements are specified in Regulation 1467/97 as being fulfilled if *"the differential [of the general government gross debt] with respect to the reference value has decreased over the previous three years at an average ½th per year as a benchmark"*. The Regulation provides that *"the requirement under the debt criterion shall also be considered to be fulfilled if the budgetary forecasts of the Commission indicate that the required reduction in the differential will occur over the three-year period encompassing the two years following the final year for which data are available"*. It further indicates that *"the influence of the cycle on the pace of debt reduction"* should be taken into account. However, the opening an EDP on that basis is not automatic, as the Commission has to take into account a long list of relevant factors detailed in Article 2(3) in Regulation (EC) No 1467/97.

([16]) All the country-specific developments regarding the Excessive Deficit Procedure can be followed up at: https://ec.europa.eu/info/business-economy-euro/economic-and-fiscal-policy-coordination/eu-economic-governance-monitoring-prevention-correction/stability-and-growth-pact/corrective-arm-excessive-deficit-procedure/excessive-deficit-procedures-overview_en

either in 2016 or in 2017. After examining all relevant factors, namely (i) the unfavourable but improving macroeconomic conditions and low inflation, (ii) the risk of non-compliance with the requirements under the preventive arm in both 2016 and 2017, and (iii) the observed marked slowdown in the implementation of growth-enhancing structural reforms, the report concluded that the debt criterion should be considered as not complied with, unless the government credibly enacted additional structural measures by April 2017 to ensure broad compliance with the preventive arm. However, the Commission announced that the decision on whether to recommend opening an EDP would only be taken on the basis of the Commission 2017 spring forecast, taking into account outturn data for 2016 and the implementation of the fiscal commitments made by the Italian authorities in February 2017. Following the enactment of those measures, the Commission indicated that no further assessment of compliance with the debt criterion in 2015 would be needed, and a new assessment of compliance with the debt criterion in 2016 based on the Commission 2017 autumn forecast was announced. In the context of the assessment of Italy's 2018 Draft Budgetary Plan, on 22 November the Commission sent a letter to the authorities emphasising that Italy's high public debt remains a key vulnerability that is a source of common concern for the euro area as a whole. In its letter, the Commission also recalled the conditions under which the Commission had concluded that a debt-based EDP should not be opened, and noted that these conditions appear at risk. The Commission announced that it intends to reassess Italy's compliance with the debt criterion in spring 2018, based on 2017 outturn data and the final 2018 budget.

In the case of Belgium, the Commission concluded on 22 May 2017 based on notified data for 2016 and the 2017 Commission spring forecast that the debt criterion as defined in the Treaty should be considered as complied with. Gross government debt reached 105.9% of GDP in 2016, well above the 60% of GDP Treaty reference value and Belgium made insufficient progress towards compliance with the debt reduction benchmark in 2016. Moreover, Belgium was not projected to comply with the debt reduction benchmark in 2017 and 2018 according to both Belgium's 2017 Stability Programme and the 2017 Commission spring forecast. However, after examining all relevant factors, namely (i) the previously unfavourable but improving macroeconomic conditions, (ii) the fact that the projected significant deviation in 2016 and 2017 together could still be corrected in 2017, and (iii) the implementation of substantial growth-enhancing structural reforms, the report concluded that the debt criterion should be considered as complied with.

In the case of Finland, the Commission concluded on 22 May 2017 based on notified data for 2016 and the 2017 Commission spring forecast that the debt criterion as defined in the Treaty should be considered as complied with. General government gross debt amounted to 63.6% of GDP in 2016, above the Treaty reference value. Moreover, both Finland's 2017 Stability Programme and the Commission spring forecast 2017 projected that Finland would not comply with the debt reduction benchmark. Nevertheless, after considering all relevant factors, namely (i) the projected compliance with the recommended adjustment path towards the MTO in 2017 and 2018, (ii) the fact that the debt corrected for the effects of the cycle would have remained just below the 60% reference rate in 2016, and (iii) the positive impact of structural reforms on debt sustainability in the medium to long term, the report concluded that the debt criterion should be considered as complied with.

While no new EDPs were opened, the EDP was abrogated for Portugal on 16 June 2017 and for Greece on 25 September 2017 as their deficits had been brought below 3% of GDP in a durable manner. ([17])

2.1.2. Non-euro area Member States

On 16 June 2017, the EDP for Croatia was abrogated. ([18]) Furthermore, the Council decided to abrogate the EDP for the United

([17]) OJ L 174, 7.7.2017, p. 19-21 http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=uriserv:OJ.L_.2017.174.01.0019.01.ENG ; OJ L 256, 4.10.2017, p. 5–8 http://data.consilium.europa.eu/doc/document/ST-11240-2017-INIT/en/pdf

([18]) OJ L 256, 4.10.2017, p. 5-8 http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2017.172.01.0008.01.ENG

Kingdom on 5 December 2017. ([19]) For both Member States, the Commission concluded that the deficit had been brought below the Treaty reference value of 3% of GDP in a durable manner.

No new EDPs were opened for non-euro area Member States during 2017. Government deficits in non-euro area members of the EU remained below 3% of GDP in 2016 and are expected to remain so in 2017 according to the Commission autumn forecast 2017, with the exception of Romania, where general government deficit is projected to breach the 3% of GDP reference value (see Section I.2.2).

2.2. THE SIGNIFICANT DEVIATION PROCEDURE

The Significant Deviation Procedure (SDP) is foreseen in case a Member States has deviated significantly from its MTO or the adjustment path towards it. If such a deviation is noticed based on outturn data, the Commission shall issue a warning and, within one month, the Council shall address a recommendation towards the Member State to take measures to address the deviation.

On 16 June 2017, following a recommendation by the Commission on 22 May 2017, the Council adopted a recommendation with a view to correcting the significant observed deviation from the adjustment path toward the MTO in Romania. ([20]) The case of Romania marks the first time that the Significant Deviation Procedure (SDP) has been applied since its introduction into the EU economic governance framework in 2011. Based on the Commission spring forecast 2017 and the 2016 outturn data, Romania was found to have deviated significantly from its MTO, and was recommended to take the necessary measures to ensure that the nominal growth rate of net primary government expenditure does not exceed 3.3% in 2017. This would correspond to an annual structural adjustment of 0.5% of GDP. Romania was also recommended to use any windfall gains for deficit reduction, while budgetary consolidation measures should secure a lasting improvement in the general government structural balance in a growth-friendly manner. Finally, Romania was recommended to report on action taken by 15 October 2017. On 16 October, the Romanian authorities submitted the report on action taken, and on 24 October, the Commission reported to the Council on its enhanced surveillance mission that took place on 26-27 September 2017, on the basis of Article 11(2) of Regulation (EC) 1466/97. On 22 November, the Commission adopted a recommendation for a Council decision establishing that no effective action has been taken by Romania in response to the Council Recommendation of 16 June 2017. The Commission's overall assessment based on its autumn forecast 2017 led to the conclusion that Romania has not taken effective action, as the structural balance is set to deteriorate by 1.1% of GDP in 2017, compared to the recommended improvement of 0.5% of GDP. Moreover, the Commission 2017 autumn forecast projects a general government deficit of 3.3% of GDP in 2017, which is above the 3% of GDP Treaty reference value. On 22 November 2017, the Commission proposed also a revised recommendation to the Council, which calls on Romania to take the necessary measures to ensure that the nominal growth rate of net primary government expenditure does not exceed 3.3% in 2018. This corresponds to an annual structural adjustment of at least 0.8% of GDP in 2018. As in May 2017, Romania was also recommended to use any windfall gains for deficit reduction, while budgetary consolidation measures should secure a lasting improvement in the general government structural balance in a growth-friendly manner. Romania should report to the Council by 15 April 2018 on action taken. The Council adopted these recommendations on 5 December 2017. ([21])

([19]) Council Decision abrogating Decision 2008/713/EC on the existence of an excessive deficit in the United Kingdom, 5.12.2017, http://data.consilium.europa.eu/doc/document/ST-14852-2017-INIT/en/pdf

([20]) OJ L 216, 6.7.2017, p.1-2 http://data.consilium.europa.eu/doc/document/ST-9999-2017-INIT/en/pdf

([21]) Council Recommendation with a view to correcting the significant observed deviation from the adjustment path toward the medium-term budgetary objective in Romania, 5.12.2017, http://data.consilium.europa.eu/doc/document/ST-14853-2017-INIT/en/pdf .

2.3. THE EUROPEAN SEMESTER AND THE FISCAL COUNTRY-SPECIFIC RECOMMENDATIONS

Member States submitted the 2017 Stability or Convergence Programmes (SCPs) in April this year thereby updating their medium-term fiscal plans. Most Member States plan to move in the direction of or remain at their MTOs. Six Member States which envisaged an overall deterioration of their structural balance in the 2017 SCPs, were at or above their MTO and planned to continue adhering to them throughout the programme horizon. Only Cyprus, which was at its MTO in 2016, planned a fiscal path away from its MTO, based on the recalculated structural balance. At the same time, all Member States that had not yet reached their MTO, intended to pursue a structural adjustment towards it, with the exception of Hungary and Romania. By the end of the programme horizon, fifteen Member States planned a (recalculated) structural balance at or above their MTO, and another three expected to be in its vicinity, while Romania and Spain would maintain a distance to their MTO of more than 1% of GDP through 2020. Compared to 2016, five Member States (Belgium, Estonia, Ireland, Hungary, and Austria) changed to a less-demanding MTO for the 2017 budgets and beyond. Four Member States (Luxembourg, Portugal, Slovenia, and the United Kingdom) moved to a more demanding MTO in 2017, triggered by new minimum MTOs being more stringent than the 2016 MTOs. The United Kingdom did not nominate an MTO, and the one set by Slovenia is deemed not sufficiently stringent, so in these two cases the minimum MTOs are considered as their MTOs. For Croatia, the 2017 Convergence Programme marked the first time the MTO was set.

The adjustment towards the MTO throughout the programme period would be somewhat back-loaded in the euro area. The Stability or Convergence Programmes planned to keep the structural balance broadly stable in 2017, with a deterioration of 0.1% of GDP in the EU and an improvement of 0.1% in the euro area. From 2018 onwards, the Stability Programmes projected a fiscal contraction with an average annual tightening of around ¼% of GDP in the euro area. In the EU, consolidation in structural terms was projected at ½% of GDP in 2018 and 2019 before slowing down in 2020, with a growing number of Member States having reached their MTO.

On 11 July 2017, based on the information provided in the 2017 SCPs (and in the National Reform Programmes), the Council adopted country-specific recommendations (CSRs) as part of the 2017 European Semester. The 2017 CSRs were addressed to 27 of the 28 Member States and to the euro area as a whole, with the latter having already been endorsed by the Council on 27 January to allow the euro area dimension to be taken into account in the Member States' National Reform and Stability Programmes and the CSRs. Greece did not submit a Stability Programme and did not receive CSRs, as the surveillance takes place in the context of its macroeconomic adjustment programme. ([22])

In the area of fiscal policy, Member States were recommended to comply with the requirements of the SGP. For Member States in the corrective arm, the recommendations reiterated the need to ensure compliance with the Council recommendations under the EDP. Member States in the preventive arm were recommended to remain at their MTO or ensure sufficient progress towards it in line with the provisions of the Pact. However, the recommendations stated that, as foreseen in Regulation (EC) No 1466/97, the assessment of the budgetary plans and outcomes should take account of the Member State's budgetary balance in the light of the cyclical conditions. Therefore, Member States, for which the requirements of the preventive arm of the Stability and Growth Pact translate into a substantial fiscal effort (at least 0.5% of GDP) for 2018, were recommended to give consideration to achieving a fiscal stance that contributes to both strengthening the ongoing recovery and ensuring the sustainability of the Member States' public finances when taking policy action. Some Member States with high debt levels were also recommended to use windfall gains to accelerate the reduction of the debt ratio. On the revenue side, the recommendations called for a shift of the

([22]) According to Article 12 of Regulation (EU) No 472/2013, where a Member State is subject to a macroeconomic adjustment programme, it shall be exempt from the monitoring and assessment of the European Semester for economic policy coordination under Article 2-a of Regulation (EC) No 1466/97 for the duration of that programme.

tax burden towards taxes less detrimental for growth, and for improvement in tax compliance as well as a broadening of the tax base in specific cases. On the expenditure side, Member States were recommended to target both higher efficiency and the performance of individual expenditure items. The ageing population called for reforms in long- term care, pensions and health care ensuring the sustainability and/or the adequacy of the social security systems in Member States. CSR in the fiscal area are reported in Annex I.1.

2.4. CLOSING THE FISCAL SURVEILLANCE CYCLE IN THE EURO AREA: DRAFT BUDGETARY PLANS

In October 2017, Member States submitted their Draft Budgetary Plans (DBPs) for the budgetary year 2018, which were then assessed by the Commission. That monitoring procedure was introduced by the Two-Pack with the aim of enhancing the surveillance and coordination of budgetary and economic policies within the euro area.

All euro area Member States complied with the requirement and submitted their DBP broadly in time. ([23]) In line with the provisions of the Two-Pack Code of Conduct, two Member States (Austria and Germany) submitted no-policy change DBPs due to caretaker governments being in place. The incoming governments are expected to submit full DBPs once they take office. Spain submitted a no-policy-change DBP as well, due to a delay in the budgetary process. The Commission invited Spain to submit an updated DBP as soon as the government is able to present a draft budget law. In the case of the Netherlands, the outgoing government submitted a DBP in due time, which was later complemented by an addendum, reflecting the budgetary plans of the incoming government, which the Commission took into account in its assessment.

The macroeconomic scenarios underlying the DBPs suggest that the economic expansion in the euro area continues, but remains atypical and incomplete. According to the DBPs, aggregate real GDP in the euro area (excluding Greece) is expected to grow by 2.2% in 2017 and 2.0% in 2018. As indicated in Chapter I.1., the Commission autumn forecast 2017 projects similarly strong growth rates for the euro area, at 2.2% in 2017 and 2.1% in 2018. Nevertheless, the recovery appears incomplete and atypical. Specifically, core inflation and wage growth remain unusually low, while the recovery is supported by exceptional tailwinds such as the ECB's accommodative monetary policy. This indicates the appropriateness of a broadly neutral fiscal stance in 2018, which would also be in line with the European Fiscal Board's report on the euro area. ([24]).

The aggregate headline deficit is expected to decrease, benefiting from cyclical improvements. According to the Commission forecast, the euro area deficit will decrease from 1.6% of GDP in 2016 to 1.1% in 2017, while the DBPs imply a marginally higher deficit of 1.2% of GDP 2017. For 2018, the Commission forecast expects the headline deficit to decline to 0.9%, fully in line with the DBPs. Public debt is expected to continue on its slow declining path thanks to the cyclical upswing and continued low interest rates. The aggregate debt-to-GDP ratio is projected to decline from 88% in 2017 to 86% in 2018, based on the DBPs, broadly in line with the Commission forecast.

On the basis of the DBPs themselves, the Commission did not identify any case of "particularly serious non-compliance" with the provisions of the SGP. Nonetheless, some of the DBPs gave rise to concerns about the planned fiscal effort. In the case of Belgium, France, Italy and Portugal, the Commission sent letters asking for further information and highlighted a number of preliminary observations related to the Draft Budgetary Plans. The Member States concerned replied at the end of October, and this information has been taken into account in the Commission's assessment of budgetary developments and risks. Overall, the assessments of the DBPs flagged different degrees of risk and requested, where

([23]) Being under a macroeconomic adjustment programme, Greece was not obliged to submit a plan, as the programme already provides for close fiscal monitoring. The obligation to provide a DBP stems from Article 6 of Regulation 473/2013. However, Article 13 of Regulation 473/2013 foresees that Member States subject to a macroeconomic adjustment programme are not covered by Articles 6 to 12 of that regulation.

([24]) European Fiscal Board (2017).

needed, appropriate action by the Member States in order to ensure compliance with the SGP.

The recitals of the 2017 Council Recommendations for Member States for which the matrix implies a fiscal adjustment of 0.5% of GDP or above, state that the assessment of the 2018 DBPs would take due account of the goal of achieving a fiscal stance that contributes to both strengthening the ongoing recovery and ensuring the sustainability of a Member State's public finances. In that context, the Council noted the Commission's intention to carry out an overall assessment in light of the cyclical situation of Member States concerned. While compliance continues to be assessed with respect to the matrix-based requirement as indicated in the Recommendations, the Commission can exercise some discretion when assessing the compliance with the SGP of a Member State that is flagged by quantitative indicators as (at risk of) significantly deviating from its required adjustment. The legal basis can be found from the specific terms of Article 6(3) of Council Regulation (EC) No 1466/97, whereby the overall assessment is linked to precise quantitative criteria without being limited to those criteria, which allows for other elements to be taken into account. In the concrete application of those considerations, where appropriate the Commission has used its margin of discretion allowed for in the SGP when assessing the 2018 DBPs. Box.II.3.2 provides additional explanations on discretion, how it was applied and the conclusions reached in the context of the Commission's opinions on the 2018 Draft Budgetary Plans submitted by euro area Member States.

For some Member States (Cyprus, Finland, Italy, and Slovenia), the Commission's "plausibility tool" (see Chapter II.3.) indicated that the estimated output gaps for 2017 based on the commonly-agreed methodology are subject to particular uncertainty. In these cases, in its assessment of the DBP the Commission analysed the output gap in more detail under the "constrained judgement" approach, without this having an impact on the assessment of compliance with the SGP.

In order to facilitate the comparison, the assessment of the plans was summarised in three broad categories: (i) "compliant", (ii) "broadly compliant" and (iii) "at risk of non-compliance". These categories have different implications, depending on whether a Member state is in EDP or not. The opinions of the Commission are presented in Tables I.2.1 and I.2.2.

Six DBPs were found to be "compliant" with the provisions of the SGP. They were submitted by the following Member States under the preventive arm – Germany, Lithuania, Latvia, Luxembourg, Finland and the Netherlands. Of those, three Member States (Germany, the Netherlands and Luxembourg) were above their MTO.

The DBPs of six Member States were found to be "broadly compliant" with the SGP. They were Spain - currently under the corrective arm of the SGP – and Estonia, Ireland, Cyprus, Malta and Slovakia - under the preventive arm. In the case of Spain, under EDP, the Commission autumn forecast 2017 projects that a timely correction of the excessive deficit in 2018, although neither the headline deficit target of 2.2% of GDP nor the required fiscal effort is projected to be met. For the remaining Member States, all under the preventive arm, the Commission forecast projects some deviation from the MTO or the adjustment path towards it, but the shortfall relative to the requirement would not represent a significant deviation. These Member States, where applicable, were also assessed to comply with the debt rule, where applicable. The Commission invited the authorities of the Member States with a broadly compliant DBP to stand ready to take further measures within the national budgetary process to ensure that the 2018 budget will be compliant with the SGP.

Finally, the DBPs of six Member States were found to be "at risk of non-compliance" with the rules of the SGP. In the case of France, which is currently under the corrective arm and could become subject to the preventive arm from 2018 onwards if a timely and sustainable correction of the excessive deficit is achieved, the Commission forecast for 2018 projects a significant deviation from the required adjustment path towards the MTO, and non-compliance with the debt reduction benchmark. Among the Member States currently under the preventive arm, Belgium, Italy, Austria, Portugal and Slovenia were projected to deviate significantly from the required adjustment path towards the MTO. In making use of its degree of discretion, and following an encompassing assessment of sustainability and stabilisation challenges, the Commission concluded that a fiscal adjustment that departs from the requirement can

be deemed adequate for Italy and Slovenia, provided that they effectively ensure such a fiscal adjustment in 2018. However, such an adjustment does not appear to be delivered. The Commission invited the authorities of all five Member States in this risk category to take the necessary measures within the national budgetary process to ensure that the 2018 budget will be compliant with the SGP. In the case of Belgium and Italy, also non-compliance with the debt reduction benchmark is projected. These Member States were invited to use windfall gains to accelerate the reduction of the government debt-to-GDP ratio, and the Commission recalled that compliance with the preventive arm requirements is a key relevant factor when assessing compliance with the debt criterion.

Table I.2.1: **Overview of individual Commission opinions on the DBPs - Member States under the preventive arm of the SGP**

Member States	Overall compliance of the DBP with the SGP		Progress with implementing the fiscal-structural part of the 2017 country-specific recommendations
	Overall conclusion of compliance in 2018 based on the Commission 2017 autumn forecast	Compliance with the preventive arm requirements in 2017 and 2018	
BE*	Risk of non-compliance	2017: risk of a significant deviation from the adjustment path towards the MTO based on 2016-2017 together, prima facie non-compliance with the debt reduction benchmark; 2018: risk of a significant deviation from the adjustment path towards the MTO, prima facie non-compliance with the debt reduction benchmark.	Some progress
DE***	Compliant	2017: MTO overachieved; compliance with the debt reduction benchmark; 2018: MTO overachieved; compliance with the debt reduction benchmark.	Limited progress
EE	Broadly compliant	2017: No deviation from the adjustment path towards the MTO; 2018: Some deviation from the adjustment path towards the MTO.	n.a.
IE	Broadly compliant	2017: risk of a significant deviation from the adjustment path towards the MTO based on 2016-2017 together, compliance with the transitional debt rule; 2018: risk of some deviation from the adjustment path towards the MTO based on 2017 and 2018 together, compliance with the transitional debt rule.	Some progress
IT**	Risk of non-compliance	2017: risk of a significant deviation from the adjustment path towards the MTO, prima facie non-compliance with the debt reduction benchmark; 2018: risk of a significant deviation from the adjustment path towards the MTO, prima facie non-compliance with the debt reduction benchmark.	Some progress
CY	Broadly compliant	2017: risk of some deviation from the MTO; compliance with the transitional debt rule; 2018: risk of some deviation from the MTO, compliance with the transitional debt rule.	Some progress
LT	Compliant	2017: MTO overachieved; 2018: MTO overachieved.	Some progress
LV	Compliant	2017: No deviation from the adjustment path towards the MTO; 2018: No deviation from the adjustment path towards the MTO.	Some progress
LU	Compliant	2017: MTO overachieved; 2018: MTO overachieved.	Limited progress
MT	Broadly compliant	2017: MTO overachieved; 2018: risk of some deviation from the MTO.	Some progress
NL****	Compliant	2017: MTO overachieved; 2018: MTO overachieved.	Some progress
AT***	Risk of non-compliance	2017: risk of a significant deviation from the adjustment path towards the MTO based on 2016-2017 together, compliance with the debt reduction benchmark; 2018: risk of a significant deviation from the adjustment path towards the MTO based on 2017-2018 together, compliance with the debt reduction benchmark.	Some progress

(Continued on the next page)

Table (continued)

PT	Risk of non-compliance	2017: risk of a significant deviation from the adjustment path towards the MTO, compliance with the transitional debt rule within the allowed annual deviation; 2018: risk of a significant deviation from the adjustment path towards the MTO, compliance with the transitional debt rule within the allowed annual deviation.	Limited progress
SK	Broadly compliant	2017: risk of some deviation from the adjustment path towards the MTO; 2018: risk of some deviation from the adjustment path towards the MTO;	Some progress
SI	Risk of non-compliance	2017: risk of some deviation from the adjustment path towards the MTO, compliance with the transitional debt rule; 2018: risk of a significant deviation from the adjustment path towards the MTO, compliance with the transitional debt rule.	Some progress
FI*	Compliant	2017: No deviation from the adjustment path towards the MTO, compliance with the debt reduction benchmark; 2018: No deviation from the adjustment path towards the MTO, compliance with the debt reduction benchmark.	Some progress

* The Commission issued a report on 22 May 2017 in accordance with Article 126(3) TFEU for the Member State. The report concluded that, after the assessment of all relevant factors, the debt criterion should be considered as complied with.
** The Commission issued a report on 22 February 2017 in accordance with Article 126(3) TFEU in which it concluded that unless the additional structural measures, worth at least 0.2% of GDP that the government committed to adopt at the latest in April 2017 were credibly enacted by that time in order to reduce the gap to broad compliance with the preventive arm in 2017 (and thus in 2016), the debt criterion should be considered as not complied with at that stage. On 22 May 2017, the Commission concluded that the requested additional consolidation measures for 2017 had been delivered.
*** DBP submitted by a caretaker government on a no-policy-change basis.
**** The DBP submitted by the outgoing government has been updated with an addendum by the new government.
Source: Commission services.

Table I.2.2: **Overview of individual Commission opinions on the DBPs - Member States under the corrective arm of the SGP**

Member States	**Overall compliance of the DBP with the SGP**		**Progress with implementing the fiscal-structural part of the 2017 country-specific recommendations**
	Overall conclusion of compliance in 2018 based on the Commission 2017 autumn forecast	**Compliance with the corrective arm requirements in 2017 and 2018 (or preventive arm if applicable)**	
ES	Broadly compliant	2017: intermediate headline target met, fiscal effort not delivered; 2018 headline deficit projected below 3%, headline target and fiscal effort not delivered.	Some progress
FR*	Risk of non-compliance	2017: headline deficit projected just below 3% of GDP, headline target and fiscal effort not delivered; 2018: risk of significant deviation from the adjustment path towards the MTO, prima facie non-compliance with the transitional debt rule.	Some progress

* France is currently under the corrective arm of the SGP, but could move to the preventive arm as from 2018 if the excessive deficit would be corrected in a timely and sustainable manner.
Source: Commission services.

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ANNEX 1
Overview of EDP and SDP steps and Country-Specific fiscal Recommendations

Table I.A1.1: **Overview EDP steps – Euro area Member States**

	Treaty Art.	Member State																
		IE	FR	ES	LV	MT	LT	BE	DE	IT	NL	AT	PT	SI	SK	CY	FI	MT
Starting phase																		
Commission adopts EDP-report = start of the procedure	126(3)	18.02.2009	18.02.2009	18.02.2009	18.02.2009	13.05.2009	13.05.2009	07.10.2009	07.10.2009	07.10.2009	07.10.2009	07.10.2009	07.10.2009	07.10.2009	07.10.2009	12.05.2010	12.05.2010	21.05.2013
Economic and Financial Committee adopts opinion	126(4)	27.02.2009	27.02.2009	27.02.2009	27.02.2009	29.05.2009	29.05.2009	27.10.2009	27.10.2009	27.10.2009	27.10.2009	27.10.2009	27.10.2009	27.10.2009	27.10.2009	27.05.2010	27.05.2010	21.06.2013
Commission adopts:																		
opinion on existence of excessive deficit	126(5)																	
recommendation for Council decision on existence of excessive deficit	126(6)	24.03.2009	24.03.2009	24.03.2009	02.07.2009	24.06.2009	24.06.2009	11.11.2009	11.11.2009	11.11.2009	11.11.2009	11.11.2009	11.11.2009	11.11.2009	11.11.2009	15.06.2010	15.06.2010	29.05.2013
recommendation for Council recommendation to end this situation	126(7)																	
Council adopts:																		
decision on existence of excessive deficit	126(6)																	
recommendation to end this situation	126(7)	27.04.2009	27.04.2009	27.04.2009	07.07.2009	07.07.2009	07.07.2009	02.12.2009	02.12.2009	02.12.2009	02.12.2009	02.12.2009	02.12.2009	02.12.2009	02.12.2009	13.07.2010	13.07.2010	21.06.2013
deadline for correction of excessive deficit		***2013***	***2012***	***2012***	***2012***	***2010***	***2011***	***2012***	***2013***	***2012***	***2013***	***2013***	***2013***	***2013***	***2013***	***2012***	***2011***	***2014***
Follow-up																		
Commission adopts communication on action taken					27.01.2010			15.06.2010	15.06.2010	15.06.2010	15.06.2010	15.06.2010	15.06.2010	15.06.2010	15.06.2010	27.01.2011	27.01.2011	15.11.2013
Commission adopts recommendation for NEW Council recommendation to end situation of excessive deficit	126(7)	11.11.2009	11.11.2009	11.11.2009		27.01.2010	27.01.2010				29.05.2013		27.09.2012					
Council adopts recommendation for NEW Council recommendation to end situation of excessive deficit	126(7)	02.12.2009	02.12.2009	02.12.2009		16.02.2010	16.02.2010				21.06.2013		09.10.2012					
new deadline for correction of excessive deficit		***2014***	***2013***	***2013***		***2011***	***2012***				***2014***		***2014***					
Commission adopts communication on action taken		15.06.2010	15.06.2010	15.06.2010		06.01.2011	21.09.2010	11.01.2012			15.11.2013					11.01.2012		
Commission adopts recommendation for Council decision establishing inadequate action	126(8)							29.05.2013										
Council adopts decision establishing inadequate action	126(8)							21.06.2013										
Commission adopts recommendation for a Council decision to give notice	126(9)							29.05.2013										
Council adopts decision to give notice	126(9)							21.06.2013										
Commission adopts recommendation for NEW Council recommendation to end situation of excessive deficit	126(7)	03.12.2010	29.05.2013	06.07.2012									29.05.2013	29.05.2013		07.05.2013		
Council adopts recommendation for NEW Council recommendation to end situation of excessive deficit	126(7)	07.12.2010	21.06.2013	10.07.2012									21.06.2013	21.06.2013		16.05.2013		
new deadline for correction of excessive deficit		***2015***	***2015***	***2014***				***2013***					***2015***	***2015***		***2016***		
Commission adopts communication on action taken		24.08.2011	15.11.2013	14.11.2012				15.11.2013						15.11.2013		06.09.2013*		
Commission adopts recommendation for NEW Council recommendation to end situation of excessive deficit	126(7)		27.02.2015	29.05.2013														
Council adopts recommendation for NEW Council recommendation to end situation of excessive deficit	126(7)		10.03.2015	21.06.2013														
new deadline for correction of excessive deficit			***2017***	***2016***														
Commission adopts communication on action taken			01.07.2015	15.11.2013														
Commission adopts recommendation for Council decision establishing inadequate action	126(8)			07.07.2016									07.07.2016					
Council adopts decision establishing inadequate action	126(8)			12.07.2016									12.07.2016					
Commission adopts recommendation for Council implementing decision imposing a fine for failure to take effective action	126(8)			27.07.2016									27.07.2016					
Commission adopts recommendation for Council decision to give notice	126(9)			27.07.2016									27.07.2016					
Council adopts decision to give notice	126(9)			08.08.2016									08.08.2016					
new deadline for correction of excessive deficit				***2018***									***2016***					
Council adopts implementing decision on imposing a fine for failure to take effective action	126(8)			08.08.2016									08.08.2016					
Commission adopts communication on action taken				16.11.2016									16.11.2016					
Commission adopts proposal for Council opinion on Economic Partnership Programme													16.11.2016					
Abrogation																		
Commission adopts recommendation for Council decision abrogating existence of excessive deficit	126(12)	18.05.2016			29.05.2013	14.11.2012	29.05.2013	02.06.2014	30.05.2012	29.05.2013	02.06.2014	02.06.2014	22.05.2017	18.05.2016	02.06.2014	18.05.2016	29.06.2011	12.05.2015
Council adopts decision abrogating existence of excessive deficit	126(12)	17.06.2016			21.06.2013	04.12.2012	21.06.2013	20.06.2014	22.06.2012	21.06.2013	20.06.2014	20.06.2014	16.06.2017	17.06.2016	20.06.2014	17.06.2016	12.07.2011	19.06.2015

Note: * In line with Regulation (EU) No 472/2013 on the strengthening of economic and budgetary surveillance of Member States in the euro area experiencing or threatened with serious difficulties with respect to their financial stability (Two-pack) the assessment of effective action is carried out in the context of the programme surveillance.

Source: Commission services.

Table I.A1.2: **Overview EDP steps - Non-euro area Member States**

Steps in EDP procedure	Treaty Art.	Member State							
		HU	UK	PL	RO	CZ	BG	DK	HR
Starting phase									
Commission adopts EDP-report = start of the procedure	126(3)	12.05.2004	11.06.2008	13.05.2009	13.05.2009	07.10.2009	12.05.2010	12.05.2010	15.11.2013
Economic and Financial Committee adopts opinion	126(4)	24.05.2004	25.06.2008	29.05.2009	29.05.2009	27.10.2009	27.05.2010	27.05.2010	29.11.2013
Commission adopts:									
opinion on existence of excessive deficit	126(5)								
recommendation for Council decision on existence of excessive deficit	126(6)	24.06.2004	02.07.2008	24.06.2009	24.06.2009	11.11.2009	06.07.2010	15.06.2010	10.12.2013
recommendation for Council recommendation to end this situation	126(7)								
Council adopts:									
decision on existence of excessive deficit	126(6)								
recommendation to end this situation	126(7)	05.07.2004	08.07.2008	07.07.2009	07.07.2009	02.12.2009	13.07.2010	13.07.2010	21.01.2014
deadline for correction of excessive deficit		***2008***	***fin. year 2009/10***	***2012***	***2011***	***2013***	***2011***	***2013***	***2016***
Follow-up									
Commission adopts communication on action taken				03.02.2010		15.06.2010	27.01.2011	27.01.2011	02.06.2014
Commission adopts recommendations for Council decision establishing inadequate action	126(8)	22.12.2004	24.03.2009						
Council adopts decision establishing inadequate action	126(8)	18.01.2005	27.04.2009						
Commission adopts recommendation for NEW Council recommendation to end excessive deficit situation	126(7)	16.02.2005	24.03.2009		08.02.2010				
Council adopts NEW recommendation to end excessive deficit situation	126(7)	08.03.2005	27.04.2009		16.02.2010				
new deadline for correction of excessive deficit		***2008***	***fin. year 2013/14***		***2012***				
Commission adopts communication on action taken		13.07.2005		11.01.2012	21.09.2010				
Commission adopts recommendations for Council decision establishing inadequate action	126(8)	20.10.2005							
Council adopts decision establishing inadequate action	126(8)	08.11.2005							
Commission adopts recommendation for NEW Council recommendation to end excessive deficit situation	126(7)	26.09.2006	11.11.2009						
Council adopts NEW recommendation to end excessive deficit situation	126(7)	10.10.2006	02.12.2009						
new deadline for correction of excessive deficit		***2009***	***fin. year 2014/15***						
Commission adopts communication on action taken		13.06.2007	06.07.2010						
Commission adopts recommendations for Council decision establishing inadequate action	126(8)		12.05.2015						
Council adopts decision establishing inadequate action	126(8)		19.06.2015						
Commission adopts recommendation for NEW Council recommendation to end excessive deficit situation	126(7)	24.06.2009	12.05.2015	29.05.2013					
Council adopts NEW recommendation to end excessive deficit situation	126(7)	07.07.2009	19.06.2015	21.06.2013					
new deadline for correction of excessive deficit		***2011***	***fin. year 2016/17***	***2014***					
Commission adopts communication on action taken		27.01.2010	16.11.2015						
Commission adopts recommendations for Council decision establishing inadequate action	126(8)	11.01.2012		15.11.2013					
Council adopts decision establishing inadequate action	126(8)	24.01.2012		10.12.2013					
Commission adopts recommendation for NEW Council recommendation to end excessive deficit situation	126(7)	06.03.2012		15.11.2013					
Council adopts NEW recommendation to end excessive deficit situation	126(7)	13.03.2012		10.12.2013					
new deadline for correction of excessive deficit		***2012***		***2015***					
Commission adopts communication on action taken		30.05.2012		02.06.2014					
Abrogation									
Commission adopts recommendation for Council decision abrogating existence of excessive deficit	126(12)	29.05.2013	22.11.2017	12.05.2015	29.05.2013	02.06.2014	30.05.2012	02.06.2014	
Council adopts decision abrogating existence of excessive deficit	126(12)	21.06.2013	04.12.2017	19.06.2015	21.06.2013	20.06.2014	22.06.2012	20.06.2014	

Source: Commission services.

Table I.A1.3: **Overview EDP steps - Greece**

Steps in EDP procedure	Treaty Art.	Greece
Starting phase		
Commission adopts EDP-report = start of the procedure	126(3)	18.02.2009
Economic and Financial Committee adopts opinion	126(4)	27.02.2009
Commission adopts:		
opinion on existence of excessive deficit	126(5)	
recommendation for Council decision on existence of excessive deficit	126(6)	24.03.2009
recommendation for Council recommendation to end this situation	126(7)	
Council adopts:		
decision on existence of excessive deficit	126(6)	27.04.2009
recommendation to end this situation	126(7)	
deadline for correction of excessive deficit		***2010***
Follow-up		
Commission adopts recommendations for Council decision establishing inadequate action	126(8)	11.11.2009
Council adopts decision establishing inadequate action	126(8)	02.12.2009
Commission adopts Council recommendation for decision to give notice	126(9)	03.02.2010
Council decision to give notice	126(9)	16.02.2010
new deadline for correction of the excessive deficit		***2012***
Commission adopts communication on action taken		09.03.2010
Council adopts conclusions thereon		16.03.2010
Commission adopts recommendation for NEW Council decision to give notice	126(9)	04.05.2010
Council decision to give notice	126(9)	10.05.2010
new deadline for correction of the excessive deficit		***2014***
Follow-up - 1st review		
Commission adopts communication on action taken		19.08.2010
Commission adopts recommendation for Council decision amending the Council decision to give notice	126(9)	19.08.2010
Council decision amending the Council decision to give notice	126(9)	07.09.2010
Follow-up - 2nd review		
Commission adopts communication on action taken		09.12.2010
Commission adopts recommendation for Council decision amending the Council decision to give notice	126(9)	09.12.2010
Council decision amending the Council decision to give notice	126(9)	20.12.2010
Follow-up - 3rd review		
Commission adopts communication on action taken		24.02.2011
Commission adopts recommendation for Council decision amending the Council decision to give notice	126(9)	24.02.2011
Council decision amending the Council decision to give notice	126(9)	07.03.2011
Follow-up - 4th review		
Commission adopts communication on action taken		01.07.2011
Commission adopts recommendation for Council decision amending the Council decision to give notice	126(9)	05.07.2011
Council decision amending the Council decision to give notice	126(9)	12.07.2011
Follow-up - 5th review		
Commission adopts communication on action taken		26.10.2011
Commission adopts recommendation for Council decision amending the Council decision to give notice	126(9)	26.10.2011
Council decision amending the Council decision to give notice	126(9)	08.11.2011
Follow-up - Second Adjustment Programme		
Commission adopts communication on action taken		09.03.2012
Commission adopts recommendation for Council decision amending the Council decision to give notice	126(9)	09.03.2012
Council decision amending the Council decision to give notice	126(9)	13.03.2012
Follow-up - Second Adjustment Programme		
Commission adopts communication on action taken		30.11.2012
Commission adopts recommendation for Council decision amending the Council decision to give notice	126(9)	30.11.2012
Council decision amending the Council decision to give notice	126(9)	04.12.2012
new deadline for correction of the excessive deficit		***2016***
Follow-up - Third Adjustment Programme		
Council adopts decision to give notice	126(9)	20.08.2015
Abrogation		
Commission adopts recommendation for Council decision abrogating existence of excessive deficit	126(12)	12.07.2017
Council adopts decision abrogating existence of excessive deficit	126(12)	25.09.2017

Source: Commission services.

Table I.A1.4: **Overview SDP steps - Romania**

	Treaty Art.	Romania
Starting phase		
Commission adopts:		
recommendation with a view to giving warning on the existence of a significant observed deviation	121(4)	22.05.2017
recommendation for Council recommendation with a view to correcting the significant observed deviation	121(4)	22.05.2017
Council adopts recommendation with a view to correcting the significant observed deviation	121(4)	16.06.2017
deadline for report on action taken		***15.10.2017***
Follow-up		
Commission adopts:		
recommendation for Council decision on no effective action	121(4)	22.11.2017
recommendation for Council recommendation with a view to correcting the significant observed deviation	121(4)	22.11.2017
Council adopts:		
decision on no effective action	121(4)	05.12.2017
recommendation with a view to correcting the significant observed deviation	121(4)	05.12.2017
new deadline for report on action taken		***15.04.2018***

Source: Commission services.

Table I.A1.5: **Overview of Council Country-Specific Recommendations relating to fiscal policy**

Situation in spring as far as fiscal surveillance is concerned for 2017 and 2018							
	Applicable provisions of the SGP (Spring 2017)	**Other relevant information**	**CSR on fiscal adjustment**	**CSR on fiscal framework**	**CSR on spending reviews**	**CSR on taxation**	**CSR on pensions and health-care**
BE	• Preventive arm • Debt benchmark	• MTO: 0% • Debt > 60%	Pursue a substantial fiscal effort in 2018 in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of Belgium's public finances. Use windfall gains, such as proceeds from asset sales, to accelerate the reduction of the general government debt ratio.	Agree on an enforceable distribution of fiscal targets among all government levels and ensure independent fiscal monitoring.		Remove distortive tax expenditures.	
BG	Preventive arm	• MTO: -1% • Debt < 60%				Further improve tax collection and tax compliance, including through a comprehensive set of measures beyond 2017. Step up enforcement of measures to reduce the extent of the informal economy, in particular undeclared work.	Increase health insurance coverage, reduce out-of-pocket payments and address shortages of healthcare professionals.
CZ	Preventive arm	• MTO: -1% • Debt < 60%				Ensure the long-term sustainability of public finances, in view of the ageing population. Increase the effectiveness of public spending, in particular by fighting corruption and inefficient practices in public procurement.	
DK	Preventive arm	• MTO: -0.5%					
DE	• Preventive arm • Debt benchmark	• MTO: -0.5% • Debt > 60%	While respecting the medium-term objective, use fiscal and structural policies to support potential growth and domestic demand as well as to achieve a sustained upward trend in investment.			Further improve the efficiency and investment-friendliness of the tax system. Reduce disincentives to work for second earners and facilitate transitions to standard employment. Reduce the high tax wedge for low-wage earners.	
EE	Preventive arm	• MTO: -0.5% • Debt < 60%	Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails remaining at its medium-term budgetary objective in 2018.				
IE	• Preventive arm • Transition period debt rule	• MTO: -0.5% • Debt > 60%	Pursue a substantial fiscal effort in 2018 in line with the requirements of the preventive arm of the Stability and Growth Pact. Use any windfall gains arising from the strong economic and financial conditions, including proceeds from asset sales, to accelerate the reduction of the general government debt ratio.			Limit the scope and the number of tax expenditures and broaden the tax base.	
EL			To avoid duplication with measures set out in the Economic Adjustment Programme, there are no additional recommendations for Greece.				
ES	Corrective arm	EDP deadline: 2018	Ensure compliance with the Council Decision of 8 August 2016, including also measures to strengthen the fiscal and public procurement frameworks.	Ensure compliance with the Council Decision of 8 August 2016, including also measures to strengthen the fiscal and public procurement frameworks.	Undertake a comprehensive expenditure review in order to identify possible areas for improving spending efficiency.		
FR	Corrective arm	EDP deadline: 2017 • MTO: -0.4% • Debt > 60%	Ensure compliance with the Council recommendation of 10 March 2015 under the excessive deficit procedure. Pursue a substantial fiscal effort in 2018 in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of France's public finances.		Comprehensively review expenditure items with the aim to make efficiency gains that translate into expenditure savings.	Consolidate the measures reducing the cost of labour to maximise their efficiency in a budget-neutral manner and in order to scale up their effects on employment and investment. Broaden the overall tax base and take further action to implement the planned decrease in the statutory corporate-income rate.	
HR	• Preventive arm • Debt benchmark	• MTO:-1.75% • Debt>60%	Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails remaining at its medium-term budgetary objective in 2018.	By September 2017, reinforce budgetary planning and the multiannual budgetary framework, including by strengthening the independence and mandate of the Fiscal Policy Commission.		Take the necessary steps for the introduction of the value-based property tax.	Discourage early retirement, accelerate the transition to the higher statutory retirement age and align pension provisions for specific categories with the rules of the general scheme.
IT	• Preventive arm • Debt benchmark	• MTO: 0% • Debt >60%	Pursue a substantial fiscal effort in 2018, in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of Italy's public finances. Ensure timely implementation of the privatisation programme and use windfall gains to accelerate the reduction of the general government debt-to-GDP ratio.			Shift the tax burden from the factors of production onto taxes less detrimental to growth in a budget-neutral way by taking decisive action to reduce the number and scope of tax expenditures, reforming the outdated cadastral system and reintroducing the first residence tax for high-income households. Broaden the compulsory use of electronic invoicing and payments.	

(Continued on the next page)

Table (continued)

CY	• Preventive arm • Transition period debt rule	• MTO: 0% • Debt >60%	Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails remaining at its medium-term budgetary objective in 2018. Use windfall gains to accelerate the reduction of the general government debt ratio.				Adopt legislation for a hospital reform and advance with the planned implementation of universal health care coverage
LV	• Preventive arm	• MTO: -1% • Debt < 60%	Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails achieving its medium-term budgetary objective in 2018, taking into account the allowances linked to the implementation of the systemic pension reform and of the structural reforms for which a temporary deviation is granted.			Reduce taxation for low-income earners by shifting it to other sources that are less detrimental to growth and by improving tax compliance.	Increase the cost-effectiveness of and access to healthcare, including by reducing out-of-pocket payments and long waiting times.
LT	• Preventive arm	• MTO: -1% • Debt < 60%	Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails remaining at its medium term budgetary objective in 2018, taking into account the allowances linked to the implementation of the systemic pension reform and of the structural reforms for which a temporary deviation is granted.			Improve tax compliance and broaden the tax base to sources that are less detrimental to growth.	Take steps to address the medium-term fiscal sustainability challenge related to pensions. Improve the performance of the healthcare system by strengthening outpatient care, disease prevention and affordability.
LU	• Preventive arm	• MTO: -0.5% • Debt < 60%					Ensure the long-term sustainability of the pension system, limit early retirement and increase the employment rate of older people.
HU	• Preventive arm • Debt benchmark	• MTO: -1.5% • Debt > 60%	Pursue a substantial fiscal effort in 2018 in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of Hungary's public finances.			Complete the reduction of the tax wedge for low-income earners and simplify the tax structure, in particular by reducing the most distortive sector-specific taxes.	
MT	Preventive arm	• MTO: 0% • Debt<60%			Expand the scope of the ongoing spending reviews to the broader public sector and introduce performance-based public spending.		
NL	• Preventive arm • Debt benchmark	• MTO:-0.5% • Debt>60% in 2016 and debt <60% as of 2017	While respecting the medium-term objective, use fiscal and structural policies to support potential growth and domestic demand, including investment in research and development.			Take measures to reduce the remaining distortions in the housing market and the debt bias for households, in particular by decreasing mortgage interest tax deductibility. Address the high increase in the self-employed without employees, including by reducing tax distortions favouring self-employment, without compromising entrepreneurship, and by promoting access of the self-employed to affordable social protection.	Based on the broad preparatory process already launched, make the second pillar of the pension system more transparent, inter-generationally fairer and more resilient to shocks.
AT	• Preventive arm • Debt benchmark	• MTO:-0.5% • Debt>60%	Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails achieving its medium-term budgetary objective in 2018, taking into account the allowance linked to unusual events.	Rationalise and streamline competencies across the various layers of government and align their financing and spending responsibilities.			Ensure the sustainability of the healthcare system and of the pension system.
PL	• Preventive arm	• MTO:-1% • Debt <60%	Pursue a substantial fiscal effort in 2018, in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of Poland's public finances.			Take steps to improve the efficiency of public spending and limit the use of reduced VAT rates.	Ensure the sustainability and adequacy of the pension system by taking measures to increase the effective retirement age and by starting to reform the preferential pension arrangements.
PT	• Preventive arm • Transition period debt rule	• MTO: 0.3% • Debt >60%	Ensure the durability of the correction of the excessive deficit. Pursue a substantial fiscal effort in 2018 in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of Portugal's public finances. Use windfall gains to accelerate the reduction of the general government debt-to-GDP ratio.	Strengthen expenditure control, cost effectiveness and adequate budgeting, in particular in the health sector with a focus on the reduction of arrears in hospitals and ensure the sustainability of the pension system.	Step up efforts to broaden the expenditure review to cover a significant share of general government spending across several policies.		**Ensure the long-term sustainability of the health sector,** without compromising access to primary healthcare. **Reduce the reliance of the pension system on budgetary transfers**
RO	• Preventive arm	• MTO:-1% • Debt <60%	In 2017, ensure compliance with the Council Recommendation of 16 June 2017 with a view to correcting the significant deviation from the adjustment path toward the medium-term budgetary objective. In 2018, pursue a substantial fiscal effort in line with the requirements of the preventive arm of the Stability and Growth Pact.	Ensure the full application of the fiscal framework.		Strengthen tax compliance and collection. Fight undeclared work, including by ensuring the systematic use of integrated controls.	Adopt legislation equalising the pension age for men and women. In healthcare, shift to outpatient care and curb informal payments.

(Continued on the next page)

Table (continued)

SI	• Preventive arm • Transition period of the debt rule	• MTO: 0.3% • Debt >60%	Pursue a substantial fiscal effort in 2018 in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of Slovenia's public finances.				Adopt and implement the proposed reform of the healthcare system and adopt the planned reform of long-term care, increasing cost-effectiveness, accessibility and quality care. Fully tap the potential of centralised procurement in the health sector. Adopt the necessary measures to ensure the long-term sustainability and adequacy of the pension system.
SK	• Preventive arm	• MTO:-0.5% • Debt <60%	Pursue a substantial fiscal effort in 2018 in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of Slovakia's public finances.		Improve the cost-effectiveness of the healthcare system, including by implementing the value-for-money project.		Improve the cost-effectiveness of the healthcare system, including by implementing the value-for-money project
FI	• Preventive arm • Debt benchmark	• MTO:-0.5% • Debt >60%	Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails achieving its medium-term budgetary objective in 2018, taking into account the allowances linked to unusual events, the implementation of the structural reforms and investments for which a temporary deviation is granted.				Ensure timely adoption and implementation of the administrative reform to improve cost-effectiveness of social and healthcare services.
SE	• Preventive arm	• MTO:-1% • Debt<60%				Address risks related to household debt, in particular by gradually limiting the tax deductibility of mortgage interest payments or by increasing recurrent property taxes, while constraining lending at excessive debt-to-income levels. Foster investment in housing and improve the efficiency of the housing market, including by introducing more flexibility in setting rental prices and revising the design of the capital gains tax.	
UK	• Preventive arm • Transition period of the debt rule	• MTO:-0.8% • Debt >60%	Pursue a substantial fiscal effort in 2018-19 in line with the requirements of the preventive arm of the Stability and Growth Pact, taking into account the need to strengthen the ongoing recovery and to ensure the sustainability of the United Kingdom's public finances.				

Source: Commission services.

Part II

Recent developments in fiscal surveillance

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KEY FINDINGS

The structural balance has a prominent role in defining and assessing compliance with Member States' obligations under the Stability and Growth Pact. However, it contains several features that can raise operational challenges for fiscal policymaking and surveillance. This part describes the two initiatives taken to make surveillance evolve to overcome this difficulty in the present context.

The agreement in the Economic and Financial Committee

- The Commission, together with the Economic and Financial Committee of the Council, has made efforts to increase transparency and predictability in the implementation of the Pact and to reduce complexity within the existing legal framework.

- In this context, a larger role has been given to the expenditure benchmark when setting and assessing fiscal policies under the Pact. The expenditure benchmark sets an upper limit to the rate at which government expenditure can grow in a single year and can therefore be seen as an expenditure ceiling. Governments can spend more than the ceiling provided that they raise the corresponding additional revenues.

- The expenditure benchmark provides, as a rule, a predictable and stable benchmark, as it is relatively easy to measure and focuses more upon those policy levers that are controlled by government.

"Constrained judgement"

- The second initiative focuses upon the estimates of the output gap, which are an essential input to the computation of the structural balance. They are calculated using a methodology decided collectively in the Economic and Financial Committee.

- The Commission may now –under limited and specific circumstances agreed by Member States– depart from the output gap estimates of the commonly agreed methodology in its assessment of the cyclical position of the Member State concerned when conducting its fiscal assessments. That process is referred to as the application of "constrained judgement".

- When the "plausibility tool" indicated an uncertainty surrounding the estimated output gaps, the Commission decided to take this element into account as part of its wider assessment of the cyclical situation of Member States with large fiscal requirements for 2018 and at risk of significant deviation from those requirements. This practice is part of the decision by the Commission to apply its degree of discretion when assessing a departure from the required adjustment for 2018.

1. INTRODUCTION

The Stability and Growth Pact (SGP) has undergone a number of reforms over the last decade, aiming at strengthening its economic underpinning and its adaptability to changing economic conditions. The reforms have allowed for a better understanding and monitoring of Member States' fiscal policy actions. By doing so, they have also addressed a number of shortcomings of the structural balance, a key indicator for fiscal surveillance that may be, and frequently is, affected by non-policy effects. In particular, the reforms have put greater emphasis on aggregate expenditure developments and revenue-increasing (or -decreasing) measures, that is, on what the government can control more directly.

However, there has been a growing perception that the fiscal rules have become too complex and that they face a range of implementation difficulties in relation to the measurement and robustness of key surveillance indicators. Currently, two different sets of budgetary indicators are used to assess compliance with each of the two arms of the SGP. That practice has come as a result of discussion with Member States over the years, to have complementary signals and to improve the measurement of the fiscal effort carried out by the government ("input-based approach"). The multiplicity of indicators has, however, increased the complexity of the framework. This complexity has in turn led to questions about equal treatment over time and across Member States and predictability of policymaking.

Against that background, the Commission has explored ways within the existing legal framework to increase the transparency and predictability of the application of the SGP rules and reduce complexity. The Commission Communication of 21 October 2015 on "Steps towards Completing Economic and Monetary Union" ([25]) identified a number of pathways towards improving the transparency and predictability of policy-making and reducing complexity. The approach retained by the Communication has been to discuss with the Council the possible concrete adjustments to be brought to the framework, on the basis of technical contributions by Commission staff.

As a result of the subsequent discussion in the Economic and Financial Committee (EFC), it has been agreed to introduce a greater focus on the expenditure benchmark and reduce the number of technical indicators used to check compliance with the rules of the SGP. That agreement essentially consists in introducing the preventive arm's expenditure benchmark into the corrective arm of the SGP, in place of the indicators used until now. At the same time, it clarifies the working of the preventive arm in certain aspects. In parallel, the Commission has enhanced transparency, for instance, through an annual update of its Vade mecum on the SGP, the production of detailed country reports and sharing the data and calculations underlying surveillance decisions with the Member States. ([26])

The Commission, together with the Member States, has also looked into the difficult issue of output gaps and introduced the "constrained judgement" approach. In particular, following repeated requests that improvements be made to the commonly agreed methodology for the estimation of potential growth and the output gap, two concrete steps were agreed by the EFC in October 2016. First, it was agreed that a revised methodology for the estimation of the non-accelerating wage rate of unemployment would be introduced in the commonly agreed methodology. That change was implemented in the Commission 2016 autumn forecast. Second, it was agreed that a new "plausibility tool" could be used to signal cases where the results of the agreed methodology could be interpreted as being subject to a large degree of uncertainty. Specifically, the EFC approved the use of the "plausibility tool" within the autumn 2016 surveillance exercise as part of a wider approach to considering estimates of the output gap within the fiscal framework. That wider approach has been described as the exercise of "constrained judgement".

Chapter II.2 covers the EFC agreement on the compliance indicators used in the SGP framework and is structured as follows. Section II.2.1. describes the rationale behind the

([25]) European Commission (2015).

([26]) European Commission (2017).

Box II.1.1: The Commission proposal for incorporating into EU law the substance of the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union

The Treaty on Stability, Coordination and Governance in the Economic and Monetary Union (TSCG) was signed in March 2012 by 25 Contracting Parties (all the current Member States, except the Czech Republic, Croatia and the United Kingdom) and entered into force on 1 January 2013. The cornerstone of the TSCG is its Title III, which sets out the so-called "Fiscal Compact". Its main provision is the obligation to enshrine in binding and permanent national provisions, preferably constitutional, a balanced-budget rule in cyclically-adjusted terms. The rule mirrors the requirement that is at the centre of the preventive arm of the SGP, namely the medium-term budgetary objective. The Fiscal Compact binds 22 Contracting Parties (all euro area Member States and, on a voluntary basis, Bulgaria, Denmark and Romania). As the intergovernmental approach used to adopt the TSCG was understood from the outset as a way to take necessary steps at the height of the economic and financial crisis, the Contracting Parties enshrined in the TSCG the agreement to seek integration of its substance into Union law at most within five years of the date of its entry into force, i.e. by 1 January 2018.

Accordingly, the EMU deepening package put forward by the Commission on 6 December 2017 includes a proposal for a "Council Directive laying down provisions for strengthening fiscal responsibility and the medium-term budgetary orientation in the Member States" ([1]). The legal basis of the proposal is the second paragraph of Article 126(14) of the TFEU.

The proposed directive seeks to achieve, along with the existing provisions of the SGP, the underlying objective of the Fiscal Compact, namely convergence to prudent levels of public debt. Indeed, the high levels of public debt still observable today will take time to be absorbed. Further progress therefore remains imperative and requires annual budgetary decisions to follow a steady orientation towards achieving and maintaining medium-term budgetary objectives.

There is a strong rationale for bringing the essence of the Fiscal Compact into the body of the EU fiscal framework. It would ensure more effective and systematic monitoring of implementation and enforcement of fiscal rules at both EU and national level as part of the overall EU economic governance framework, compared to the current intergovernmental set-up. It diminishes the possible risks of duplications and conflicting actions inherent in the co-existence of intergovernmental arrangements alongside the mechanisms foreseen by EU law. A consolidated framework governed by EU law would also facilitate a consistent and coordinated evolution of the EU and national fiscal rules within the wider process of EMU deepening. Above all, as argued in the Five Presidents' Report on Completing Europe's Economic and Monetary Union, the integration into the Union legal framework of all inter-governmental instruments created during the crisis would bring greater democratic accountability and legitimacy across the Union.

Specifically, the legislative proposal lays down an obligation to have in place a national framework of permanent and binding fiscal rules which, while being consistent with the rules of the SGP, increases the national ownership of a sound fiscal policy. That framework must ensure the convergence of public debt-to-GDP ratio towards the 60% Treaty reference value by establishing an anchoring medium-term objective in terms of structural balance and by setting for the whole term of a Member State's legislature a path for expenditure net of discretionary revenue measures that is consistent with that objective or the adjustment path towards it and is binding on annual budgets throughout the period. A correction mechanism must also be automatically triggered in the event of significant observed deviations with a view to compensating deviations from that expenditure path. The proposal brings about a strengthening of the role and independence of national fiscal councils, which should assess ex-ante and ex-post the adequacy of the medium-term objective and the expenditure path and call for the activation of the correction mechanism in case of significant deviations. Not least, the directive gives a legal basis to the principle of "comply-or-justify" in order to boost the reputational costs of non-compliance with the national fiscal rules.

([1]) https://ec.europa.eu/info/publications/economy-finance/completing-europes-economic-and-monetary-union-policy-package_en

(Continued on the next page)

Box (continued)

As the EMU and its completion must remain open to all Member States, the proposed directive should apply to both the euro area countries and other Member States wishing to be bound by it. According to the proposal, Member States would have until 30 June 2019 to bring into force the national provisions necessary to comply with it.

EFC agreement. Section II.2.2. recalls the logic behind, and the precise definition of, the expenditure benchmark. Section II.2.3. describes how the expenditure benchmark will be used in the corrective arm of the SGP. Section II.2.4. lists the clarifications brought by the EFC agreement as to the working of the preventive arm.

Chapter II.3 covers the "constrained judgement" approach in relation to the estimation of output gaps and is structured as follows. Section II.3.1. provides an overview of the "plausibility tool", including a detailed box on the underlying statistical methodology. Section II.3.2 explains in greater detail how the "constrained judgement" approach can be derived from the "plausibility tool". Section II.3.3 explains how "constrained judgement" affects the assessments of compliance within the fiscal framework. Finally, the fiscal surveillance implications of the application of "constrained judgement" in the autumn of 2016, the spring and the autumn of the 2017 are set out in Section II.3.4. Reference is also made to how the uncertainty surrounding the estimated output gaps, as indicated by the results of the "plausibility tool", was factored in when assessing a departure from the fiscal adjustment for 2018.

On 6 December 2017, the Commission made a proposal to integrate the substance of the Treaty on Stability, Coordination and Governance into the Union legal framework. The proposal takes into account the appropriate flexibility built into the Stability and Growth Pact. Box II.1.1 provides an overview of that proposal.

2. THE RECENT AGREEMENT OF THE ECONOMIC AND FINANCIAL COMMITTEE ON A GREATER FOCUS ON THE EXPENDITURE BENCHMARK

2.1. THE RATIONALE BEHIND THE EFC AGREEMENT

The 2005 reform of the SGP introduced the concept of structural balance that has since gained a relevant role in defining, and assessing compliance with, Member States' obligations under the SGP. ([27]) The structural balance aims to remove the effects of the economic cycle on government budget balances, through a methodology that is well known and widely used among experts. The rationale behind the 2005 reform was that Member States should be judged on whether they have delivered on their policy commitments, rather than on the basis of budgetary outcomes (typically the headline deficit) that can to a large extent be outside their control because of impact of the economic cycle. This method of judgement is also referred to as "conditional" compliance with the rules.

However, the structural balance suffers from its own weaknesses, notably in terms of measurement. Despite the strong conceptual underpinning of the structural balance approach, its implementation is not without difficulty because it must be calculated rather than observed. It can fail to capture the real fiscal efforts made by governments, essentially due to two methodological and measurement issues. ([28])

Firstly, in the structural balance, economic fluctuations are measured by (changes in) the gap between real and potential output. The output gap is unobserved and is subject to frequent and often significant revisions, including on an *ex post* basis. This is not only a technical matter, it also relates to the difficulty of estimating the position in the business cycle in real time.

Secondly, the crisis has shown that the structural balance can be seriously affected by revenue shortfalls/windfalls, in the event of large annual volatility of revenues. The structural balance is built under the assumption of a "standard" response of revenues (and unemployment benefits) to economic fluctuations. While that assumption holds in the medium and long term, revenues typically react differently in the short run. That difference in reaction may especially occur during significant downturns or upturns. In such instances, revenues tend to overreact, which leads to an overly negative or positive picture of the government's fiscal position and change thereof as measured by the structural balance.

Such overreactions raise operational challenges for fiscal policy making and surveillance. From an operational perspective, the difficulty in measuring the structural balance implies important challenges for the conduct of fiscal policy (typically in the context of the preparation and implementation of annual budgets) if based solely on that indicator. It also raises issues of assessing the delivery of the required fiscal effort in the context of surveillance procedures that can ultimately lead to financial sanctions.

Some aspects of the 2011 six-pack reform and subsequent non-legislative changes to the EU's fiscal surveillance framework have sought to mitigate the shortcomings of the structural balance approach. In the preventive arm of the SGP, the 2011 reform introduced the so-called expenditure benchmark, which essentially defines the fiscal effort required in fiscal surveillance in terms of an upper limit for the growth rate of government primary expenditure unless the excess is funded by revenue-increasing measures. ([29]) In the corrective arm of the Pact, the structural balance approach has undergone a number of adjustments. In particular, revisions affecting the estimates for potential output and the response of revenues to economic developments are taken into account at the time of assessments. In addition, the

([27]) The 2005 reform took the form of Council Regulations (EC) No 1055/2005 and 1056/2005 amending Council Regulations (EC) No 1466/97 and 1467/97, respectively.

([28]) See also European Commission (2013), Carnot and de Castro (2015).

([29]) The expenditure benchmark was introduced through Regulation (EU) No 1175/2011 of the European Parliament and of the Council amending Council Regulation (EC) No 1466/97.

structural balance approach has been complemented by a quantification of fiscal policy measures (essentially on the revenue side), which is known as the "bottom-up approach". ([30])

Those changes have put greater emphasis on policy levers but have also led to increased complexity. The changes introduced in the surveillance framework have put greater emphasis on aggregate expenditure developments and revenue-increasing (or -decreasing) measures, that is, on what is more directly under the control of the government. However, they have also led to a multiplicity of indicators, a complex formulation thereof and, ultimately, to increased complexity.

As a result, currently two different sets of indicators are used in assessing compliance with each of the two arms of the Pact. While conceptually related, the structural balance indicators used in the preventive and the corrective arms of the SGP are not fully consistent with each other (non-adjusted change in the structural balance in the preventive arm, adjusted change in the corrective arm). That absence of perfect consistency is also true for the expenditure benchmark and the bottom-up approach, which are arguably in most respects the closest. Assessments within each arm are subject to judgement through an overall assessment (called "careful analysis" in the corrective arm), not least when the two indicators convey different messages. While that judgement allows for a comprehensive evaluation, taking into account the relevant circumstances, there is a potential lack of certainty given the absence of a pre-determined dominant indicator.

Against that background, the Commission and the Council have agreed a common interpretation of the rules. That agreement took the form of two opinions of the EFC of 29 November 2016 which were endorsed by the Council on 6 December 2016. ([31]) ([32]) The EFC agreement essentially consists in introducing the expenditure benchmark in the corrective arm of the SGP. At the same time, it clarifies the working of the preventive arm in certain aspects.

([30]) For a description of the indicators used up until then in the corrective arm of the SGP, see European Commission (2014).
([31]) Council of the European Union (2016a, 2016b).
([32]) Council of the European Union (2016c).

2.2. DEFINITION AND RATIONALE BEHIND THE EXPENDITURE BENCHMARK

The expenditure benchmark is essentially an expenditure ceiling for setting and assessing fiscal policies under the SGP. The expenditure benchmark sets an upper limit to the rate at which government expenditure can grow in a single year. It can therefore be seen as the maximum amount that a government can spend in a year. That maximum is benchmarked against the expected growth of the economy over a period of ten years.

Governments can spend more than the ceiling provided that they raise the corresponding additional revenues. Any excess expenditure growth over the benchmark rate can be funded by revenue-increasing fiscal policy measures. Conversely, revenue-decreasing measures should be funded by additional savings, thereby reducing the expenditure ceiling by the same amount.

The underlying principle behind the expenditure benchmark is sound. The use of such a benchmark allows for a greater focus upon those policy levers that are controlled by government while guarding against expenditure growth based on temporary revenue streams. The latter situation occurred in the pre-crisis period when windfall revenues served to fund what later turned out to be unsustainable expenditure patterns.

In particular, the expenditure benchmark provides a predictable and stable benchmark and is relatively easy to measure. Government expenditure is a policy lever mostly in the hands of government rather than a policy outcome influenced by external factors. Non-discretionary spending items, such as interest payments and cyclical unemployment expenditure, are excluded from the benchmark whereas investment expenditure, which can be highly volatile, is smoothed over a number of years. Similarly, on the revenue side the focus is on fiscal policy measures, which are less volatile than non-discretionary changes in revenues, despite suffering from some weaknesses themselves. The expenditure benchmark is also easier to measure than the structural balance as government expenditure is a national accounts concept compiled by national statistical offices. There is no reliance on the

output gap when it comes to measuring the actual or forecast growth rate of expenditure.

The expenditure benchmark can be directly used for the conduct of fiscal policy at the national level. Domestic fiscal policy decisions, and in particular annual budgets, are essentially a matter of setting expenditure ceilings and legislating revenue-increasing (or -decreasing) fiscal policy measures. By contrast, non-discretionary changes in revenues and some non-discretionary expenditure items are cyclically or market driven and are therefore largely dependent on the underlying macroeconomic assumptions. Therefore, beyond its role at the EU level, the expenditure benchmark also constitutes an operational guide for setting fiscal policies and monitoring their in-year execution at the national level.

It is also easy to communicate to stakeholders and the general public. Because expenditure caps are widely used in the preparation and consideration of national budgets throughout the EU, the expenditure benchmark is also easy to communicate to Ministers, to other stakeholders and to the public. In addition, it highlights the policy "ownership" of national governments, which exercise direct control over expenditure.

At the same time, the expenditure benchmark does not restrain governments' "size". Any excess growth over the benchmark rate can be funded by revenue-increasing fiscal policy measures, meaning that the expenditure benchmark leaves governments free to set what they think is the appropriate level of spending, as long as it is funded appropriately.

Despite those advantages, the expenditure benchmark has its own weaknesses and can face similar challenges to other budgetary indicators. Returns from discretionary revenue measures, which are a key component of the expenditure benchmark, can sometimes be subject to a large degree of uncertainty and their estimation can be largely model-dependent. That uncertainty calls for constantly improving costing methods and making them as transparent as possible. The expenditure benchmark also requires the estimation of the medium-term benchmark growth rate of the economy to set the requirements. Therefore, even though estimates of potential growth rates are typically more stable and reliable than estimates of output gap levels, the expenditure benchmark does not fully dispense with a gauge for cyclical conditions.

2.3. IMPROVING THE ASSESSMENT OF EFFECTIVE ACTION IN THE CONTEXT OF THE EXCESSIVE DEFICIT PROCEDURE

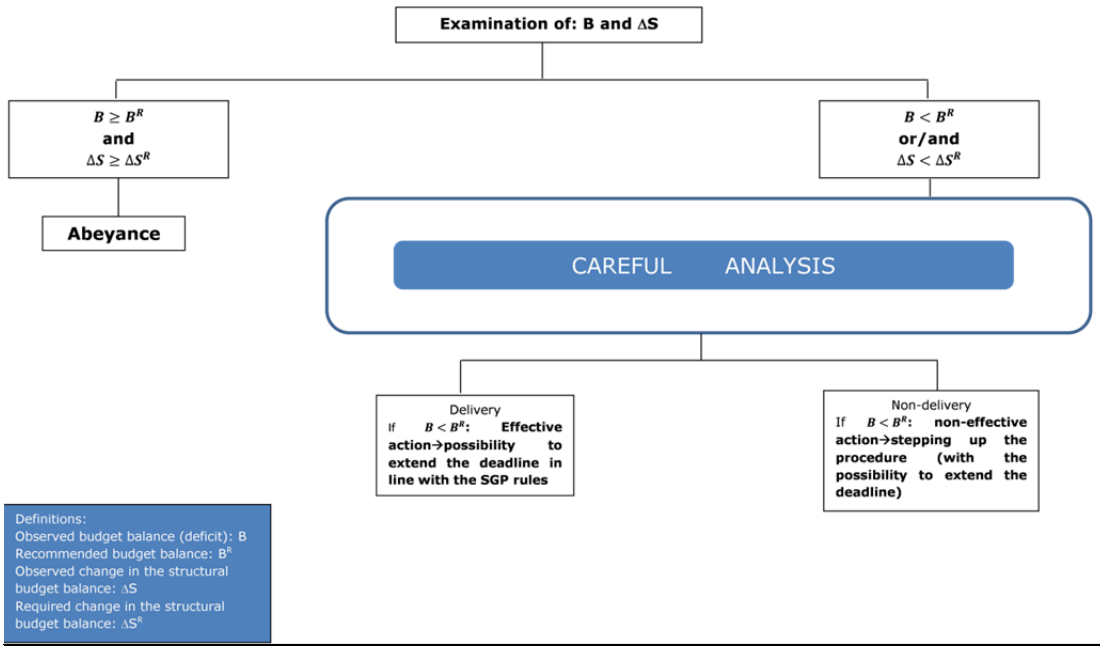
The EFC agreement makes the expenditure benchmark the cornerstone of the assessment of Member States' policy actions under the Excessive Deficit Procedure (EDP). Sub-section II.2.3.1 recalls the steps followed by the Commission when assessing compliance with EDP recommendations –the assessment of "effective action taken". The central part of that assessment is called "careful analysis". Sub-section II.2.3.2 describes how the careful analysis will be carried out in assessing compliance with any future EDP recommendations. Box II.2.1 presents an example of how it will be done in practice.

2.3.1. The sequence of steps in evaluating compliance with EDP recommendations remains unchanged

Following a Council recommendation to correct the excessive deficit, the Member State concerned has to take effective action. Where it establishes that an excessive deficit exists in a Member State, the Council issues a recommendation under Article 126(7) TFEU to the Member State concerned with a view to bringing that situation to an end within a given period. The recommendation contains annual targets both for the headline deficit and the improvement in the structural balance, which are linked by an underlying macroeconomic scenario set on the basis of the Commission forecasts. Moreover, until now a quantification of the policy response required to attain those targets, in terms of the total amount of measures to be taken, was also given. ([33])

([33]) The same logic applies with respect to notices issued under Article 126(9) TFEU to euro area Member States which have been found by the Council not to have taken effective action to comply with an Article 126(7) recommendation or with a revised notice under Article 126(9) TFEU.

Graph II.2.1: **EDP decision tree for assessing effective action**



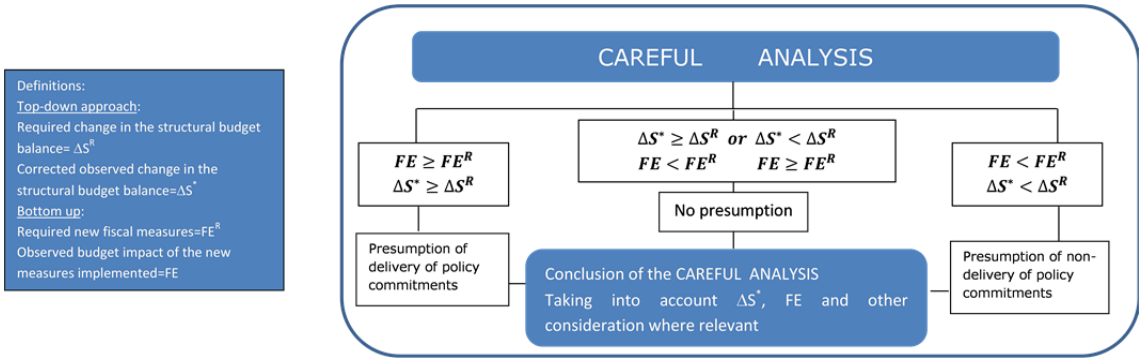
Source: Commission services.

The Commission and the Council monitor compliance with EDP recommendations on a regular basis. The Commission undertakes a first assessment, which looks at whether the Member State is on track to correct its excessive deficit, i.e. if it has taken effective action, within six months of the Council recommendation, or three months if the situation is judged to be particularly difficult. Depending on the outcome of that assessment, the procedure may be put into abeyance, if the Member State has acted in compliance with the recommendation – meaning it is put on hold until the excessive deficit is eventually corrected, as long as the Member State continues to comply with the recommendation – or alternatively stepped up, if the Member State has not complied with the recommendation. An EDP in abeyance is subject to continuous monitoring, on the basis of each of the Commission forecasts, and may be activated again if that monitoring shows the Member State not to be on course to comply with the recommendation.

For the assessment of whether effective action has been taken, a decision tree sets out the order of logical and procedural steps (Graph II.2.1 for a schematic overview). First, the changes in the headline and structural balances are assessed. When a Member State achieves both its headline deficit target and the recommended improvement in the structural balance, it is considered to have delivered effective action and the EDP is held in abeyance. When they are not achieved, the Commission engages in a more detailed examination, known as a careful analysis. The aim of the careful analysis is to evaluate whether the Member State concerned has delivered on the policy commitments set out in the recommendation despite the effects of the action taken not being reflected in the headline deficit or structural balance figures. If the Member State is found to have taken effective action in compliance with the recommendation and "unexpected adverse economic events with major unfavourable consequences for government finances occurred" after the adoption of that recommendation, it may be issued with a revised recommendation, including the possibility of extending the deadline for correction. ([34]) Failure to take effective action entails the stepping up of the procedure. ([35])

([34]) See Article 3(5) of Council Regulation (EC) No 1467/97.
([35]) For further detail see European Commission (2017).

Graph II.2.2: **"Old" careful analysis**



Source: Commission services.

The decision tree for assessing effective action remains unchanged after the EFC agreement. As has been the case until now, the assessment of effective action will first look at the achievement of the headline deficit targets and the underlying improvements in the structural balance. The careful analysis remains needed if one (or both) of those targets are missed. If the Member State is found to have taken effective action, the deadline for correction may be extended, provided that "unexpected adverse economic events with major unfavourable consequences for government finances occurred". If not, the EDP is stepped up.

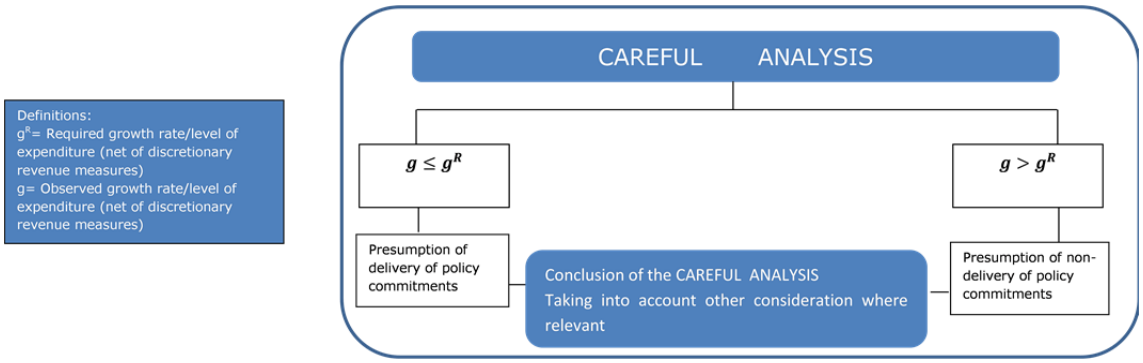
2.3.2. The expenditure benchmark becomes the cornerstone of the careful analysis

Until the EFC agreement, the careful analysis was based on two complementary fiscal indicators (Graph II.2.2). The first one is based on the structural balance, but the annual change therein is adjusted for possible forecast errors on government revenues and revisions to potential growth estimates. Those corrections are aimed at addressing the two main shortcomings of the structural balance referred to in Section II.2.1. The second indicator of compliance is known as the bottom-up approach as it aims to quantify the amounts of fiscal policy measures taken by governments.

Following the EFC agreement, the careful analysis will be centred on the expenditure benchmark, leading to a reduction in the number of compliance indicators (Graph II.2.3). For any future EDP recommendation, when the headline deficit or the underlying required improvement in the structural balance is not met, the Commission will use the expenditure benchmark to assess the delivery of affective action. If the expenditure benchmark is met, meaning that it shows an effort equal to or above what was recommended, there is a presumption that the Member State concerned has delivered on its policy commitments. If the expenditure benchmark is not met, there is a presumption that the Member State has not delivered on its policy commitments.

For the sake of transparency and predictability, future EDP recommendations will also have to be formulated in terms of the expenditure benchmark. For each year covered by the Council recommendation, the recommendation will specify the maximum allowable growth rate of government expenditure. The expenditure benchmark will be consistent with, and conducive to, the fulfilment of the targets for the headline deficit and the underlying improvement in the structural balance. Thus, if fully complied with, the expenditure benchmark will effectively lead to a timely correction of the excessive deficit (including compliance with the forward-looking component of the debt-reduction benchmark), as long as macroeconomic developments and events that are outside government control remain in line with the so-called "EDP scenario" (that is, the set of assumptions underpinning the EDP recommendation). Therefore, the benchmark growth rate of net expenditure is computed on the basis of the EDP scenario. Concretely, the (yearly) benchmark is the limit to the annual change in government expenditure consistent with meeting

Graph II.2.3: **"New" careful analysis**



Source: Commission services.

the targets for the headline deficit and the change in the structural balance.

The composition of fiscal adjustment will remain a policy choice. Member States will remain free to increase expenditure by more than the benchmark rate as long as the excess growth is funded by revenue-increasing fiscal policy measures. Conversely, should revenue-decreasing policy measures be implemented, the allowable rate of growth of expenditure will have to be reduced proportionately.

The allowable growth rate of government expenditure will be formulated in nominal terms and net of one-off measures. In turn, when assessing compliance with the expenditure benchmark, both the expenditure aggregate and the amounts of discretionary revenue measures to be subtracted from that aggregate will be calculated net of one-off measures, and the growth rate of net expenditure will be expressed in nominal terms.

The careful analysis will continue to take other considerations into account where relevant. The Commission will continue to use quantitative and qualitative economic judgement in making its final assessment where relevant. Any conclusion will need to take into consideration the quantitative information from the expenditure benchmark together with other considerations – including of qualitative nature – that do not emerge from the benchmark itself. Those considerations are typically related to the reasons that have caused the non-fulfilment of the expenditure benchmark and are directly linked to fiscal developments, such as possible statistical revisions of data; unexpected dynamics in certain expenditure items driven by unusual events outside the control of the government; unforeseen inflation developments; or a high degree of uncertainty surrounding the quantitative assessment of the revenue measures implemented by the government.

For multi-annual EDPs, compliance with the expenditure benchmark will be assessed on a cumulative basis from the start of the recommendation. The experience gained since the entry into force of the six-pack reform in 2011 has shown that focusing on the evolution of the fiscal variables in a given year can lead to an asymmetry in the assessment of compliance with the recommendations. Therefore, since autumn 2014, the Commission has examined whether the fiscal effort over the correction period under scrutiny was delivered on a cumulative basis. In that way, a Member State cannot be unduly punished for a frontloaded effort. At the same time, it ensures that a Member State meeting its headline deficit target the first year without delivering the recommended annual fiscal effort would only be found compliant with the recommendation in the following years if it has delivered the cumulative fiscal effort over the correction period under scrutiny, in case the headline deficit falls short of the recommended one thereafter. Thus, for the purposes of assessing effective action, for Member States that do not meet the annual headline deficit target or the cumulative change in the structural balance, or neither of them, the assessment of the "cumulative" expenditure benchmark will be considered in the careful analysis.

Box II.2.1: **A numerical example of the expenditure benchmark in the corrective arm of the SGP**

This box presents an example of setting the EDP targets following an Article 126(7) recommendation or notice under Article 126(9) TFEU and assessing effective action on the basis of the expenditure benchmark.

Setting the EDP targets

The baseline, no-policy change scenario

Defining the EDP scenario – that is, the EDP targets and the underlying assumptions – always starts by looking at what would happen if no further fiscal policy measures were taken. This is known as the baseline, no-policy change scenario. The EFC agreement does not change the logic of the EDP scenario and the way it is constructed.

The baseline scenario is actually the Commission's most recent forecast available at the time of recommendation. Typically, it shows that the headline deficit breached the 3% of GDP limit in the previous year, which triggers the opening of an EDP. In some cases, the Commission's forecast horizon (which covers years T and T+1, and T+2 in the case of the autumn forecast) is extended if a longer correction period is being contemplated.

In the example shown in Table II.2.a, the headline deficit reached 4% of GDP in year T-1, based on notified data. The deficit is forecast to stay at 4% in years T and T+1, meaning that it would remain above 3% of GDP if no further measures were taken. By further measures are meant any measures that would come on top of those included in the Commission's no-policy change forecast.

Table II.2.a: **The baseline, no-police change scenario**

	Year t–1	Year t	Year t+1
	Outturn	Forecast	
GDP growth (constant prices – in %)		1.5	1.5
GDP growth (current prices – in %)		3.5	3.5
Potential GDP growth (constant prices – in %)		1.0	1.0
Output gap (in % of potential GDP)	–3.0	–2.5	–2.0
General government balance (in % of GDP)	–4.0	–4.0	–4.0
Structural balance (in % of potential GDP)	–2.5	–2.7	–3.0
Change in structural balance (in % of potential GDP)		–0.2	–0.2

Note: Annual changes in the structural balance may not match annual levels due to rounding effects.
Source: Commission services.

The headline deficit path is also dependent on the forecast macroeconomic outlook. Here GDP is expected to grow by 1.5% in years T and T+1 in real terms and inflation to be 2% in both years.

With growth forecast above potential, the output gap is narrowing over the forecast horizon.

For the sake of simplicity, it is assumed that there are no one-off measures taken by the Member State, implying that all measures are of a permanent nature.

On this basis, and using the commonly agreed methodology for the cyclically-adjusted balance, the structural balance is estimated to deteriorate by 0.2% of potential GDP in both year T and year T+1.

(Continued on the next page)

Box (continued)

The EDP scenario

The EDP scenario is composed of headline deficit targets and required annual improvements in the structural balance which – if followed – allow bringing the headline deficit below 3% of GDP by a given deadline while ensuring that an appropriate fiscal effort is pursued.

The EDP scenario is built in an iterative way. Specifically, starting from the baseline scenario, the Commission looks at whether a one-year deadline seems reasonable in terms of the underlying fiscal effort and the impact on the macroeconomic outlook. If this seems unrealistic, for example because it would imply too high of a fiscal effort and/or because the adjustment would have too large a negative impact on GDP growth, there may be a case for a two-year deadline. And so on (for further detail on the conditions under which a longer deadline can be envisaged see European Commission (2017)).

Table II.2.b: **The EDP scenario**

	Year t–1	Year t	Year t+1
	Outturn	Forecast	
GDP growth (constant prices – in %)		0.8	0.7
GDP growth (current prices – in %)		2.8	2.7
Potential GDP growth (constant prices – in %)		1.0	1.0
Output gap (in % of potential GDP)	–3.0	–3.2	–3.4
General government balance (in % of GDP)	–4.0	–3.4	–2.7
Structural balance (in % of potential GDP)	–2.5	–1.8	–1.0
Change in structural balance (in % of potential GDP)		0.7	0.8

Note: Annual changes in the structural balance may not match annual levels due to rounding effects.
Source: Commission services.

In the example, the EDP scenario as shown in Table II.2.b is such that it brings the headline deficit to 3.4% of GDP in year T and 2.7%, i.e. below the 3% limit, in year T+1. The corresponding improvements in the structural balance that allow reaching these deficit targets under the projected cyclical developments are 0.7% of (potential) GDP in year T and 0.8% in year T+1.

Following the EFC agreement, the EDP targets will from now on be defined also in terms of the expenditure benchmark, that is, the maximum allowable growth rate of expenditure consistent with, and conducive to, the fulfilment of the targets for the headline deficit and the underlying improvement in the structural balance. The expenditure benchmark is net of the possible fiscal policy (discretionary) measures assumed on the revenue side in the EDP scenario. It excludes the projected amounts of interest expenditure, expenditure on Union programmes fully matched by Union funds revenue and non-discretionary changes in unemployment benefit expenditure. Nationally financed government gross fixed capital formation is smoothed over a 4 four-year period. Any possible one-off measures, whether on the expenditure or on the revenue side, are also excluded.

In the example as shown in Table II.2.c, in the EDP scenario total government expenditure is projected to reach 51.3 billion of national currency in year T and 52.5 billion in year T+1, from 50 billion in year T-1. The modified expenditure aggregate is 47.8 billion in year T and 49.0 billion in year T+1. The latter is then corrected for the non-one-off discretionary revenue measures assumed in the EDP scenario, which gives the expenditure benchmark (1.2% in year T, 1.4% in year T+1).

(Continued on the next page)

Box (continued)

Table II.2.c: **The expenditure benchmark as per the EDP scenario**

		Year t–1	Year t	Year t+1
	in billions of national currency	Outturn	Forecast	
1	**General government expenditure**	50.0	51.3	52.5
2	**Interest expenditure**	3.0	3.0	3.0
3	**Expenditure on EU programmes fully matched by EU funds revenue**	0.1	0.1	0.2
4	**Gross fixed capital formation t net of EU funds revenue spent in investment projects**	2.8	3.0	2.9
5	**Annual average gross fixed capital formation t–3 to t net of EU funds revenue spent in investment projects**	2.9	2.9	2.9
6	**Cyclical unemployment expenditure**	0.2	0.2	0.2
7	**One-off expenditure measures**	0.0	0.0	0.0
8	**Corrected expenditure aggregate** = *(1)–(2)–(3)–((4)–(5))–(6)+(7)*	46.8	47.8	49.0
9	**Non-one-off revenue measures**		0.5	0.6
10	**Expenditure benchmark (in %)** = $[((8)_t–(9)_t)/(8)_{t-1}–1]*100$		1.2	1.4

Source: Commission services.

Assessing effective action

As explained in the text, a decision tree sets out the order of logical and procedural steps for the assessment of effective action under the EDP (Graph II.2.1). First, the headline balance and the change in the structural balance are assessed. When a Member State achieves both its headline deficit target and the recommended improvement in the structural balance, the Member State is considered to have acted in compliance with the recommendation and the EDP is held in abeyance – meaning it is put on hold until the excessive deficit is eventually corrected, as long as it continues to comply with the headline and structural targets. When this is not achieved, the Commission engages in a more detailed examination, known as the careful analysis, primarily based on an assessment of compliance with the expenditure benchmark.

Table II.2.d: **Most recent forecast/outturn data available at the time of assessment**

	Year t-1	Year t	Year t+1
	Outturn	Forecast/outturn	
GDP growth (constant prices - in %)		-0.1	-0.2
GDP growth (current prices - in %)		1.9	1.7
Potential GDP growth (constant prices - in %)		1.0	1.0
Output gap (in % of potential GDP)	-3.0	-4.0	-5.2
General government balance (in % of GDP)	-4.0	-3.7	-3.4
Structural balance (in % of potential GDP)	-2.5	-1.7	-0.8
Change in structural balance (in % of potential GDP)		0.8	0.9
Corrected expenditure aggregate net of non-one-off revenue measures (in %)		1.0	1.3

Source: Commission services.

In the example as shown in Table II.2.d, the headline deficit is above the EDP targets (3.7% of GDP in year T and 3.4% in year T+1 versus 3.4% and 2.7%, respectively). A careful analysis is therefore needed to see whether the breach is due to the macroeconomic situation turning worse

(Continued on the next page)

Box (continued)

than forecast in the EDP scenario or any other reason that is outside government control, or to the Member State not delivering on its policy commitments. In the example, the growth rates of the modified expenditure aggregate net of non-off discretionary revenue measures (1.0% in year T and 1.3% in year T+1 – see Table II.2.e for the detailed calculations) are below the recommended growth rates (1.2% and 1.4%, respectively), which means that the expenditure benchmark is met and there is a presumption that the Member State has delivered on its policy commitments.

Table II.2.e: **Calculating the growth rate of expenditure at the time of assessment**

		Year t-1	Year t	Year t+1
	in billions of national currency	Outturn	Forecast/outturn	
1	**General government expenditure**	50.0	51.0	51.9
2	**Interest expenditure**	3.0	3.0	3.0
3	**Expenditure on EU programmes fully matched by EU funds revenue**	0.1	0.2	0.2
4	**Gross fixed capital formation t net of EU funds revenue spent in investment projects**	2.8	2.8	2.7
5	**Annual average gross fixed capital formation t-3 to t net of EU funds revenue spent in investment projects**	2.9	2.8	2.8
6	**Cyclical unemployment expenditure**	0.2	0.3	0.4
7	**One-off expenditure measures**	0.0	0.0	0.1
8	**Corrected expenditure aggregate** *= (1)-(2)-(3)-((4)-(5))-(6)+(7)*	46.8	47.5	48.5
9	**Non-one-off revenue measures**		0.3	0.4
10	**Corrected expenditure aggregate net of non-one-off revenue measures (in %)** *= $[((8)_t-(9)_t)/(8)_{t-1}-1]*100$*		1.0	1.3

Source: Commission services.

2.4. CLARIFYING THE WORKING OF THE PREVENTIVE ARM OF THE SGP

2.4.1. The overall logic and working of the preventive arm remain unchanged…

In the preventive arm, Member States are required to attain their medium-term budgetary objectives (MTO) over the horizon of their stability and convergence programmes. The preventive arm of the SGP endeavours to ensure that fiscal policy is conducted so as to lead to healthy public finances over the short and longer term. It requires that Member States attain a country-specific MTO for their budgetary position after adjusting for the cyclical position of the economy as well as for one-off and other temporary measures. For Member States that are not at their MTO, an appropriate adjustment path towards it is defined and should be adhered to. The country-specific MTOs are set taking into account their respective debt levels, the country-specific sustainability challenges posed by the costs of an ageing population and the standard operation of automatic stabilisers.

To remain at their MTO, or make adequate progress towards it in terms of the change in the structural balance, Member States ensure that annual government expenditure growth does not exceed the expenditure benchmark. In particular, Member States at their MTO ensure that government expenditure grows at most in line with the benchmark defined by the medium-term rate of potential GDP growth – which is the rate that ensures adherence to the MTO over time – unless any excess expenditure growth is matched by discretionary measures yielding additional revenues. Member States on the adjustment path to the MTO ensure that their expenditure grows at a rate below that medium-term rate of potential GDP growth – the difference in growth rates being called the convergence margin – unless the excess growth in expenditure is matched by discretionary measures yielding additional revenues. The expenditure benchmark is derived (as specified in Box II.2.2) from the required improvement in the structural balance, so to be consistent with, and

conducive to, the fulfilment of the required adjustment towards the MTO. ([36])

Progress towards the MTO is assessed annually by the Commission and the Council. That assessment is done on the basis of each of the Commission forecasts. Compliance with the preventive arm requirements is evaluated notably on the basis of the structural balance and the expenditure benchmark, taking their respective strengths into account. The indication provided by the structural balance and the expenditure benchmark is always qualified through an overall assessment. It focuses on the possible sources of discrepancy between the two indicators and, on that basis, reaches a conclusion. The overall assessment can conclude that there is compliance with the requirements, or some deviation, ([37]) or a significant deviation, with the latter triggering a "significant deviation procedure" if the conclusion is based on outturn data.

The EFC agreement brings no major change to the working of the preventive arm. In particular, progress towards the MTO will continue to be gauged on the basis of the change in the structural balance and the expenditure benchmark.

2.4.2. ... but certain aspects are clarified

The EFC agreement has brought a number of clarifications on the assessment of compliance with the preventive arm of the SGP. It introduces the following clarifications.

The requirements in terms of the expenditure benchmark are now included in the Council's country-specific recommendations. Until 2016, for Member States that had not yet attained their MTOs, the adjustment requirements were set out only in terms of change in the structural balance. The corresponding expenditure benchmarks were communicated to Member States but not formally included in the country-specific recommendations. By contrast, the recommendations adopted in 2017 specified the maximum allowable growth rate of government expenditure for 2018.

The expenditure benchmark is formulated in nominal terms. For the purposes of surveillance, the medium-term rate of potential GDP growth is converted into nominal terms by using the GDP deflator from the Commission's spring forecast of the preceding year, i.e. at the time of issuing of the country-specific recommendations. The medium-term rate of potential GDP growth together with the convergence margin thus allows the required improvement in the structural balance to be translated into a maximum allowable nominal growth rate of (net) expenditure.

The expenditure benchmark is systematically corrected for one-off measures. When assessing compliance with the expenditure benchmark, the impact of one-off measures will be systemically corrected for in the context of the overall assessment: in particular, one-off expenditure measures will be systematically removed from the expenditure aggregate; similarly, any one-off revenue measures will be systematically removed from the amount of discretionary revenue measures. In previous years, there were no such systematic removals and it was a source of discrepancy between the structural balance and the expenditure benchmark which is now eliminated.

The EFC agreement recognises the more predictable and measurable nature of the expenditure benchmark over the structural balance as a rule. At the same time, the EFC agreement acknowledges that the structural balance may better reflect "structural shifts" in potential output growth, given that it uses a single year estimate of potential growth whereas the reference rate for potential underpinning the structural balance may include some exceptionally high or low yearly estimates of potential growth. It also recognises that the structural balance might provide an incentive for effective revenue administration. The Commission goes one step further in streamlining the use of surveillance indicators, to ensure equal treatment of Member States and consistency of assessments over time. As transparently indicated to Member States, it has since the EFC agreement given prominence to the expenditure benchmark when assessing compliance with the preventive arm of the SGP, unless there is a clear reason to depart from that indicator.

([36]) For further detail on the calculation of the expenditure benchmark in the preventive arm see European Commission (2017).

([37]) "Some" deviation refers to any deviation which is not significant – for the purposes of Articles 6(3) and 10(3) of Council Regulation (EC) No 1466/97.

Box II.2.2: **Derivation of the expenditure benchmark in the preventive arm of the SGP**

The expenditure benchmark is derived from a medium-term growth rate of potential output and a country-specific convergence margin.

Specifically, the expenditure benchmark L_t for year t is derived from the medium-term growth rate R_t by the deduction of a convergence margin C_t (all expressed in percentage points), as follows:

$$L_t = R_t - C_t$$

The medium-term growth rate is calculated over a 10-year window, on the basis of forward-looking projections and backward-looking estimates from the Commission spring forecast of the preceding year. The medium-term growth rate is recalculated every year.

For countries not at their MTO, the convergence margin serves to support the annual improvement of the structural balance towards the MTO (adj_t, expressed in percentage points), as required under the preventive arm of the SGP. Member States' required annual fiscal adjustment is varied so as to take into account the economic cycle as well as their debt levels and sustainability risks: it can be therefore lower or higher than the benchmark of 0.5% of GDP and reflects that greater or lower adjustment need. The size of the convergence margin also depends on the share of government primary expenditure in GDP in the preceding year (P_{t-1}, expressed in percentage points). Thus, the convergence margin is given by:

$$C_t = \frac{adj_t}{P_{t-1}} \times 100$$

For Member States at their MTO, the convergence margin is by construction set to zero.

Following the EFC agreement, for the purposes of surveillance the reference rate L_t is then converted into nominal terms by using the GDP deflator from the Commission spring forecast of the preceding year. The convergence margin thus allows translating the required improvement in the structural balance into a maximum allowable nominal growth rate of expenditure.

Council Regulation (EC) No 1466/97 does not envisage any specific adjustment requirements for Member States that are above their MTO. For analytical purposes, however, it is possible to calculate the reference rate L_t that is compatible with the Member State returning to the MTO, on the basis of the initial distance from the MTO.

In that case, the convergence margin is given by:

$$C_t = \frac{distanceMTO_{t-1}}{P_{t-1}} \times 100 \times -1$$

where $distanceMTO_{t-1}$ corresponds to the (positive) difference between the structural balance at the start of the year and the MTO. The convergence margin thus obtained does not reflect any specific requirement, under the SGP, whether in terms of the level or pace of adjustment towards the MTO.

3. THE COMMISSION'S "CONSTRAINED JUDGEMENT" APPROACH TO ASSESS THE OUTPUT GAP

3.1. THE USE OF "CONSTRAINED JUDGEMENT" IN RELATION TO OUTPUT GAP ESTIMATES

3.1.1. Introduction

The structural balance has played a central role in the EU's fiscal framework since the 2005 reforms of the Stability and Growth Pact (SGP). That measurement is an essential part of fiscal surveillance, in that it allows for an assessment of whether the underlying fiscal position of a Member State is sound beyond the observed government balance. A key input into the calculation of the structural balance is the output gap estimates, i.e. the numerical assessment of the current cyclical position of the economy. However, estimating the output gap is difficult since potential growth is not directly observable whilst the actual evolution of GDP is subject to significant historical and forecast revisions, which have a sizeable influence on output gap estimates.

The estimates of the output gap used in the surveillance process are calculated using a production function methodology. ([38]) That methodology is decided collectively through committee work by all relevant actors involved in surveillance who take decisions by unanimity. Given the importance of those estimates, the EU's Economic Policy Committee (EPC) has a dedicated working group (i.e. the "Output Gap Working Group" - OGWG) which meets regularly to discuss the operational effectiveness, relevance and possible further improvement of the existing production function methodology.

As an unobservable variable, there is necessarily a large degree of uncertainty surrounding output gap estimates. In light of this, in March 2016 the Ministers of Finance of eight Member States (Italy, Spain, Latvia, Lithuania, Luxembourg, Portugal, Slovenia and Slovakia) sent a letter to the Commission expressing their concerns regarding the estimation of potential output. Subsequently, the April 2016 Amsterdam Informal ECOFIN Council requested that improvements be made to the commonly agreed methodology for the estimation of potential growth and the output gap. In line with the mandate from the Council, two concrete steps were agreed in October 2016. First, it was agreed that a revised methodology for the estimation of the non-accelerating wage rate of unemployment would be introduced in the commonly agreed methodology. That change was implemented in the Commission autumn forecast 2016. Second, it was agreed that a new "plausibility tool" could be used to signal cases where the results of the agreed methodology could be interpreted as being subject to a large degree of uncertainty. Specifically, the Economic and Financial Committee approved the use of the "plausibility tool" within the autumn 2016 surveillance exercise as part of a wider approach to considering estimates of the output gap within the fiscal framework. That wider approach has been named "constrained judgement" and is discussed in the present Chapter.

Against this background, the purpose of Chapter II.3. is to describe how the Commission applies the "constrained judgement" approach. Section II.3.1 provides an overview of the "plausibility tool", including a detailed box on the underlying statistical methodology. Section II.3.2 explains in greater detail how the "constrained judgement" approach can be derived from the "plausibility tool". Section II.3.3 explains how the "constrained judgement" approach affects the assessments of compliance within the fiscal framework. Finally, the fiscal surveillance implications of the application of "constrained judgement" in the autumn of 2016, and in the spring and the autumn of 2017 are set out in Section II.3.4.

3.1.2. The role of the "plausibility tool" and "constrained judgement"

The application of "constrained judgment" is a two-step approach. First, it allows the Commission – under limited and specific circumstances – to depart from the output gap estimates of the commonly agreed methodology in its assessment of the cyclical position of the Member State concerned when conducting its fiscal assessments. Second, it allows the Commission to apply a "constrained" degree of

([38]) See Havik et al. (2014).

judgement in conducting Member States' budgetary assessments. The boundaries to that discretion have been agreed by the Economic and Financial Committee that also agreed to apply the "constrained judgement" for a trial period of up to two years.

The practical implementation of "constrained judgement" is done in two steps. Firstly, the "plausibility tool" is used to identify cases that warrant further examination. The tool is based on a statistical assessment methodology, which has been discussed in the OGWG on the basis of the proposed approach by the Commission (Box II.3.1). It should be recalled that the "plausibility tool" is thus intended to provide information on the degree of uncertainty/implausibility of the output gap –at a certain point in time– when estimated on the basis of the common methodology. The technicalities of that step are discussed in Section II.3. The second step consists of the use of expert judgement in using the results of the tool. It will be described below in Section II.4.

As agreed with the Economic and Financial Committee, the results of the "plausibility tool" are used asymmetrically, in that only cases where the tool indicates that the common methodology's estimate may not be sufficiently negative are considered as part of the "constrained judgement" process.

It is important to note that the "plausibility tool" has not affected the Commission autumn forecast 2016 or the spring and autumn forecast 2017 figures. The output gap and the implied structural balance estimates published in the forecasts continue to be based on the common methodology.

While the "plausibility tool" flags possible uncertainty regarding the level of the output gap, it is in itself not part of the fiscal surveillance framework. Instead, the results of the tool provide a trigger for the Commission to analyse the economic situation of the Member State concerned in more detail. This analysis is described in the second step in the application of "constrained judgement", which occurs once the identification process has been completed for the Member States flagged by the "plausibility tool". The results of the "plausibility tool" can instead be used as an additional qualitative factor to be considered in the context of the fiscal assessments, that is, the assessments of the Draft Budgetary Plans (DBPs) and Stability and Convergence Programmes (SCPs) and possible Article 126(3) reports for relevant Member States. The DBP opinions and SCP Staff Working Documents provide an explicit explanation of the outcome of the "plausibility analysis" for all Member States where the tool indicates that the output gap based on the common method may be subject to a large degree of uncertainty.

3.2. IMPLEMENTATION OF THE "PLAUSIBILITY TOOL'S" RESULTS WITHIN "CONSTRAINED JUDGEMENT"

3.2.1. Running the "plausibility tool"

The "plausibility tool" is applied to signal cases when the outcome of the commonly agreed methodology could be interpreted as being subject to particularly unusual uncertainty and therefore deserving of further investigation on the part of the Commission. As described in detail in Box II.3.1, further investigation is needed when the output gap estimates calculated using the common methodology fall outside a given statistical confidence interval, which has been agreed within the OGWG as explained above (see also the example provided in Graph II.3.1).

Graph II.3.1 provides a simplified illustrative situation where the estimate of the output gap based upon the common method is not flagged. Let us assume that the interval of reasonable output gap values built around the "plausibility tool's" central estimate is between -3.5% and -1.5% for a given year. At the same time, let us assume that the common methodology estimate for that same year is -2.0%. Given that -2.0% falls inside the interval of [-3.5, -1.5], there is no reason to flag the common methodology estimate as potentially problematic and so activate the "constrained judgment" process.

Box II.3.1: Technical description of plausibility tool

On 25 October 2016, the EFC gave the green light for the use of the plausibility tool as part of the constrained discretion approach for improving the commonly-agreed output gap methodology. This box provides a technical description of the tool (for details, see Hristov et al. (2017)).

The procedure of running the plausibility check consists of the following steps:

a. Firstly, the output gaps OG_{it} are regressed on a commonly-agreed set of k=1,…,K variables X_{it}^k that are known to be correlated with the business cycle: $OG_{it} = \sum_k \gamma^k X_{it}^k + \varepsilon_{it}$;
b. Secondly, in-sample forecasts are produced (plausibility tool projections) $\widehat{OG}_{it}$ of the output gaps as implied by the regression: $\widehat{OG}_{it} = \sum_k \gamma^k X_{it}^k$;
c. Finally, potentially "counterintuitive" output gaps are identified as those gaps that differ from their plausibility tool projection by a number above a certain threshold criterion.

Concerning step c), two different threshold criteria are used, with different implications for the Member States whose gaps have been "flagged". The two of them are based on the Root Mean Square Error (RMSE) criterion, which has some useful and intuitive econometric properties. The country-specific RMSEs are defined as:

$$\mathrm{RMSE}^{\mathrm{i}} = \sqrt{\frac{1}{\mathrm{T}^{\mathrm{i}}}\sum\nolimits_{\mathrm{t}}\left(\mathrm{OG}_{\mathrm{it}} - \widehat{\mathrm{OG}}_{\mathrm{it}}\right)^2}$$

where i identifies the specific Member States and T^i denotes the number of yearly observations for country i. Two different confidence bands, based on the RMSE measure, are used, depending on the targeted degree of certainty that the violation of the bounds by an output gap estimate is not occurring purely by chance. Let us define Q^m the m[th] quantile of the normal distribution. Then, the bounds are defined as:

$$Bound_{it}^{low} = \widehat{\mathrm{OG}}_{\mathrm{it}} - Q^m RMSE^i$$

$$Bound_{it}^{high} = \widehat{\mathrm{OG}}_{\mathrm{it}} + Q^m RMSE^i$$

Given these bounds, the first two criteria are:

i) RMSE68 for m=68;

ii) RMSE90 for m=90.

A plausibility check based on one of these two criteria is akin to identification of outliers. For example, for m=68 quantile, the endogenous variable (in this case the output gap) is expected to fall within the bounds in 68 out of 100 cases. For m=90 it is 90 out of 100 cases. If the output gap falls outside the bounds, it may be then viewed an outlier and is hence flagged as potentially "counterintuitive". It should be noted, however, that the lower the quantile used, the higher the probability of a "false positive". For example, the probability that a correctly estimated output gap is nonetheless flagged by the RMSE68 criterion is 1-.68=.32. Hence, this criterion should be expected to flag many false positive cases. The idea behind using such a broad criterion is to ensure that no "true positives" slip through the net.

By definition the RMSE90 criterion is stricter than the RMSE68 criterion in that it flags fewer output gaps. Equivalently, relatively larger discrepancies between the output gap and the plausibility tool projection could pass the former criterion. For this reason, following the EFC decision, only Member States flagged using the stricter 90% RMSE criterion are considered "clear-cut" cases (clear-cut in the sense that the risk

(Continued on the next page)

Box (continued)

that the official production function output gap estimates may be implausible is considered sufficiently high to automatically trigger an in-depth assessment by the respective ECFIN desk officer). For borderline cases (i.e. those Member States flagged using the less strict 68% RMSE criterion), no such automaticity applies.

An additional important remark is that the bounds based on the RMSE criterion are country-specific. Indeed, as demonstrated in Table II.3.1, this interval may be very wide (for example the size of the interval for the bounds based on RMSE68 for Greece is close to 7pps) or very narrow (the same interval for Italy is only 0.8pp). The Greek output gap will be flagged as implausible if it is more than 3½pps away from the estimate of the plausibility tool, while the Italian output gap will be flagged as implausible if it is more than 0.4pp away from the plausibility tool estimate.

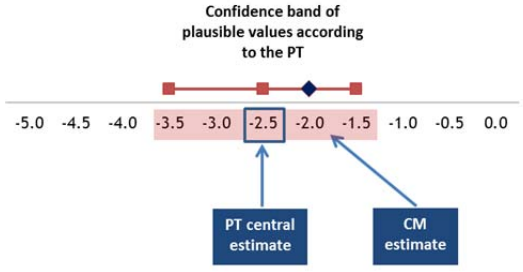
Data

The endogenous variable, the output gap, is by definition the gap between actual and potential GDP. The most recent available data vintage is used.

The table exogenous variables are:

Variable	Source
Capacity Utilisation	Capacity utilisation in the manufacturing industry (Eurostat)
Short term Unemployment Rate (as proxied by STUR)	Total unemployment rate (Eurostat, DG ECFIN)
	Long-Term Unemployment in % of Unemployment (Eurostat)
	STUR = Harmonised unemployment rate minus the long-term unemployment rate
Wage Inflation	Annual growth rate of wages per employee (DG ECFIN)
Slack in the Economy	Business Surveys (DG ECFIN), Construction Confidence Indicator
	Business Surveys (DG ECFIN), Industrial Confidence Indicator
	Service Surveys (DG ECFIN), Services Confidence Indicator
	Gross value added for each sector (DG ECFIN)
Growth in GDP (lagged)	Lagged annual change in real GDP (DG ECFIN)

Graph II.3.1: **The common methodology estimate falls inside the range of plausible values defined by the "plausibility tool"**



Note: PT = plausibility tool, CM = common methodology.
Source: Commission services.

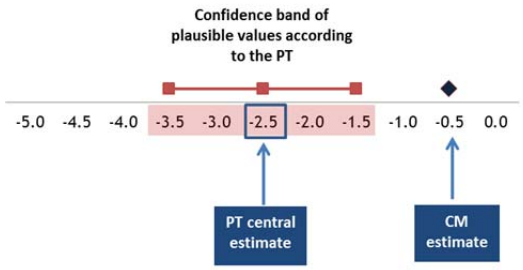
The "constrained judgment" is applied in a situation where the common methodology estimate falls outside the interval of reasonable values defined by the "plausibility tool". In contrast to the example provided in Graph II.3.1, such a situation is depicted in Graph II.3.2. In that latter case the fictional common methodology estimate (–0.5%) is not reasonably near to the plausible estimate.

3.2.2. Second step: Making the "constrained judgement" approach operational – "plausibility range" and expert judgement

The second step involves the application of "constrained judgement". That second step is to be applied when the estimate of the output gap based on the common methodology falls outside the statistically significant range of values around the "plausibility tool" central estimate, as described in Graph II.3.2. Once the common

methodology estimate of the output gap has been flagged by the "plausibility tool", the Commission has the discretion to identify the plausible level of the output gap. The latter has to be within the range defined, on the one hand, by the common methodology estimate and, on the other hand, the "plausibility tool" central estimate – i.e. [-2.5, -0.5] in the example depicted in Graph II.3.2.

Graph II.3.2: **The common methodology estimate falls outside the range of plausible values defined by the "plausibility tool"**

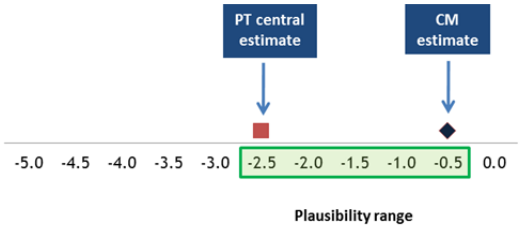


Note: PT = plausibility tool, CM = common methodology.
Source: Commission services.

The tool, however, does not specify where precisely within the "plausibility range" the most accurate estimation of the output gap lies. It is neither possible nor desirable to specify *ex ante* criteria that mechanically determine an exact position within that range. In fact, the "constrained judgment" approach is intended to allow the Commission to depart from the common methodology estimate, but not to routinely substitute it with an alternative estimate. The "plausibility range" shown in Graph II.3.3 therefore represents the constraints within which the Commission applies its judgement to identify a plausible level of the output gap. In other words, based on sound economic judgement the Commission could consider a value of the output gap other from that estimated by the common methodology, provided that it remains within that range.

It is important to stress that such a "plausibility analysis" is performed only on the current or last observed year, and cannot be produced for future years. Therefore it is not possible to generate a "plausibility range" for future years using the "plausibility tool's" results. The reason for that limitation is that the "plausibility tool" estimates rely on a regression of variables for which future values are not available. As outlined in Box II.3.1, the "plausibility tool" relies on a regression of the output gap on the main variables which are considered to be closely correlated with the economic cycle. For the tool to provide reliable results it is crucial that the estimates of those input variables are stable. As a result, the "plausibility tool" can only be used on the basis of outturn data or, at least, on the basis of released data for the first three quarters of the year (i.e. at the time of the autumn forecast). In that way the probability of significant revisions is considerably reduced. Therefore, it is not possible to generate a "plausibility range" for future years or even for the ongoing year (or at least not until the autumn forecasts are available).

Graph II.3.3: **Plausibility range for the scenario of Graph II.3.2**



Note: PT = plausibility tool, CM = common methodology.
Source: Commission services.

However, to make the "plausibility tool" operational for fiscal surveillance purposes covering future years, it is necessary to extrapolate the "plausibility range", in order to analyse if a more plausible estimate of the output gap can be identified for those years.

The Commission chose to implement the simplest available approach. It consists of taking the difference between the two estimates for T (2016 in the case of both the 2017 DBPs and SCPs) and adding it to the output gap estimate based on the common methodology for T+1 (2017) to derive a "plausibility range" for 2017 and for T+2 (2018) in the case of the SCPs. Although crude, that method is transparent and simple. Chapter II.3.3 discusses how the estimate of the output gap that has been identified within the "plausibility range" affects the fiscal surveillance procedures.

The assessment of the plausible level of the output gap under the "constrained judgment" approach has been carried out by the Commission on the basis of expert country knowledge, drawing upon a sound economic assessment. In making their assessment, Commission experts can take into account the following elements: (i) a comprehensive set of macroeconomic indicators (including but not necessarily confined to those on which the "plausibility tool" is based); (ii) relevant country-specific factors and (iii) the output gap estimates produced by the other international organisations, such as the IMF and OECD.

Following that qualitative assessment, Commission experts have two options:

- **To continue to rely on the output gap estimate based on the common methodology**. To do so implies that the uncertainty on the exact level of the output gap has no implications for the fiscal assessment of the Member State concerned;

- **To apply constrained judgment and consider the output gap estimate based on the common methodology implausible on the basis of the "plausibility tool" outcomes and expert judgment**. Depending on the level of the output gap that is found to be more plausible within the "plausibility range", there may be implications for the fiscal assessment if an alternative fiscal adjustment requirement is implied. That assessment is made in a qualitative manner and is detailed in the accompanying Commission documents, as was done for the autumn 2016 and spring 2017 surveillance exercises. However, while the alternative output gap estimate emerging from the constrained judgment process is used for surveillance purposes, it does not replace the value of the output gap in the Commission's publications.

3.3. IMPLICATIONS OF "CONSTRAINED JUDGEMENT" FOR FISCAL SURVEILLANCE

3.3.1. Application of the unfreezing principles

Under the preventive arm of the SGP, the requirements for year T are fixed in T-1, mainly on the basis of the level of the output gap in year T projected by the spring forecast of year T-1. Those requirements are derived from the matrix of requirements included in the Commonly Agreed Position on Flexibility in the Stability and Growth Pact. ([39]) Concretely, the requirement for 2018 has been fixed in spring 2017 and the one for 2017 in spring 2016. Once the requirements are fixed, they are considered to be frozen. ([40]) The principles for that freezing have been agreed with the Council to ensure predictability.

The availability of a new information set regarding the cyclical position of the Member State results in an unfreezing of the requirement in only a very restricted number of cases:

i) Where a Member State has been re-assessed as being in very bad or exceptionally bad economic times, measured as an output gap below -3% of potential output.

ii) Where the level of a Member State's structural balance has been revised, so that to deliver on its original requirement would imply an over-achievement of its MTO.

Those freezing principles are also applied regarding the implications of the "plausibility tool's" results for Member States' requirements, including the categorization of Member States under the matrix. For example, if a Member State is identified as experiencing "implausible" output gaps, and the application of the "plausibility analysis" to the 2017 output gap estimate would result in an output gap estimate below -3% of GDP, the effect of unfreezing the 2017 requirement can be taken into account in the Commission's assessment. Similarly, Member States who are close to their MTO and have been

([39]) Council of the European Union (2015).
([40]) See Section 1.3.2.2 of European Commission (2017).

identified as experiencing "implausible" output gaps has the effect of unfreezing their requirements considered if the Commission's analysis leads to a structural balance that is even closer to the MTO. The distance to MTO is based on the previous year's structural balance. ([41]) While it thus needs to be analysed whether the adjustment requirement derived from the matrix would warrant unfreezing based on the two cases just described, it does not lead to an actual revision of the formal requirement set in the country-specific recommendations. Instead, the outcome of the analysis can be taken account of as a qualitative factor when conducting the overall assessment of compliance.

3.3.2. Application to eligibility for flexibility clauses

The level change in the output gap implied by the Commission's analysis may also have an impact on some Member States' eligibility for use of the structural reform and investment clauses. The output gap change may bring them in compliance with i) the safety margin criterion (i.e. the minimum benchmark) used for assessing eligibility for both clauses or ii) the -1.5% output gap eligibility threshold for use of the investment clause. In such a case, it is mentioned in the Commission's assessments.

3.3.3. Limitations of the "plausibility tool" for "constrained judgement"

As indicated above, it is not possible to generate a "plausibility range" for future years or even for the ongoing year (or at least not until the autumn forecasts are available). As outlined in Box II.3.1, the "plausibility tool" relies on a regression of the output gap on the indicators of the cyclical position of the economy. For the tool to provide reliable results it is crucial that the estimates of those input variables are stable, and so the "plausibility tool" can only be used on the basis of outturn data or at least on the basis of released data for the first three quarters of the year (i.e. at the time of the autumn forecast). The "plausibility ranges" can only be extrapolated to future years from the most recent results available (2016 at the moment), which further underlines the fragility of the exercise.

It is also important to reiterate that only output gap levels provided by the "plausibility tool", but not the changes to those levels, can be utilised for fiscal surveillance purposes. That limitation arises because the "plausibility tool" works on a discrete year-by-year basis. In other words, the tool needs to be run separately to produce the results for each year, one at a time. Therefore, it is not designed to produce a consistent series over multiple years, a feature which would be necessary to ensure the integrity of measurements of the fiscal effort. The reason is that the measurement of the fiscal effort centres on the change in the structural balance, which itself relies on the change in output gap from one year to the next.

As a result, the "constrained judgment" approach does not affect the calculation of the change in the output gap used by the Commission for the calculation of the fiscal effort, even while it allows the point estimate of the output gap for a given year to be amended in favour of a more judgement-based estimate. The measurement of the fiscal effort used in the surveillance process continues to be calculated on the basis of the estimates delivered by the common methodology and is unaffected by the "constrained judgement" approach.

3.4. RESULTS OF THE APPLICATION OF "CONSTRAINED JUDGEMENT" IN THE FISCAL SURVEILLANCE EXERCISES SINCE AUTUMN 2016

Three Member States were found to have implausible output gap estimates in spring 2016. The results of the "plausibility tool" based on the Commission autumn forecast 2016 are shown in Table II.3.1. Based on the RMSE90 criterion, three Member States were flagged by the "plausibility tool" as experiencing common methodology output gap estimates which were subject to a large degree of uncertainty: Austria, Finland and the UK. Based on the looser RMSE68 criterion, a total of seven Member States were flagged by the "plausibility tool": Austria, Finland,

([41]) For example, if a Member State's requirement in 2017 was +0.5% of GDP, but its structural balance in 2016 was revised to a position only 0.4% below the MTO, then the original requirement would be unfrozen as its delivery implies over-achieving the MTO.

Italy, Luxembourg, Latvia, Slovenia and the UK. In all but Finland, the detailed analysis indicated that the "plausibility tool's" results had no impact on the assessment of compliance with the SGP. In the case of Finland, the analysis concluded that the alternative output gap would mean the Member State is expected to respect the safety margin in relation to the 3% of GDP deficit threshold, which is an eligibility criterion for use of the structural reform and investment clauses.

On the basis of the Commission spring forecast 2017, no Member States were flagged by the "plausibility tool" as experiencing common methodology output gap estimates which were subject to a large degree of uncertainty based on the stricter RMSE90 criterion. However, nine Member States were flagged based on the RMSE68 criterion: Austria, Cyprus, Finland, Croatia, Italy, Luxembourg, Netherlands, Latvia and the UK (Table II.3.2). As in the autumn 2016, in all but Finland's case, the detailed analysis did not affect the assessment of compliance with the SGP. In the case of Finland, the analysis confirmed that Finland is expected to meet the minimum benchmark in 2017.

On the basis of the Commission autumn forecast 2017, only Italy was flagged by the "plausibility tool" as experiencing common methodology output gap estimates which were subject to a large degree of uncertainty based on the stricter RMSE90 criterion. However, five Member States were flagged based on the RMSE68 criterion: Cyprus, Finland, Croatia, Italy and Slovenia (Table II.3.3). For Cyprus and Finland, although the "plausibility tool" provided indications of particular uncertainty, the Commission did not see sufficient ground to deviate from the estimates based on the common methodology after taking into account all relevant factors. For neither Italy nor Slovenia applying "constrained judgement" approach would affect the requirements under the preventive arm. It would thus have no implication for the assessment of their DBP.

The uncertainty surrounding the estimated output gaps for Italy and Slovenia was taken into account by the Commission when applying its degree of discretion. In line with its decision to apply its degree of discretion when assessing a departure from the required fiscal adjustment for 2018, the Commission has taken into account the uncertainty surrounding the estimated output gap, as flagged by the "plausibility tool", in its wider assessment of the cyclical situation of Member States with large fiscal requirements for 2018 and at risk of significant deviation from those requirements, namely Italy and Slovenia. Box II.3.2 explains the context behind such analysis, its rational and its conclusions in the context of Commission's opinions on the 2018 Draft Budgetary Plans submitted by euro area Member States.

Table II.3.1: **Output gap flagged by the "plausibility tool" - Year 2016a**

		RMSE90			RMSE68		
PF Gap	PT Projection	MS	Lower Bound	Upper Bound	MS	Lower Bound	Upper Bound
-0,7	-2,2	AT	-3,4	-0,9	AT	-2,9	-1,4
-0,4	-1,0	BE	-2,0	0,0	BE	-1,6	-0,4
-0,2	1,1	BG	-1,7	3,8	BG	-0,6	2,7
-0,8	-1,1	CY	-2,4	0,1	CY	-1,9	-0,4
0,1	1,3	CZ	0,4	2,2	CZ	0,8	1,9
0,0	0,0	DE	-1,0	0,9	DE	-0,6	0,6
-2,6	-1,8	DK	-3,1	-0,5	DK	-2,6	-1,0
-0,1	1,0	EE	-0,8	2,8	EE	-0,1	2,1
-10,5	-5,1	EL	-10,8	0,6	EL	-8,6	-1,7
-1,5	-1,2	ES	-3,1	0,6	ES	-2,3	-0,1
-1,8	-3,4	FI	-4,7	-2,1	FI	-4,2	-2,6
-1,4	-1,5	FR	-2,5	-0,4	FR	-2,1	-0,8
-0,9	0,6	HR	-0,7	1,8	HR	-0,2	1,3
0,7	1,0	HU	-0,3	2,4	HU	0,2	1,9
0,0	0,0	IE			IE		
-1,6	-2,1	IT	-2,8	-1,4	IT	-2,5	-1,7
0,9	0,3	LT	-1,9	2,5	LT	-1,0	1,7
-1,4	-3,4	LU	-6,1	-0,8	LU	-5,1	-1,8
1,4	-0,3	LV	-2,5	1,9	LV	-1,6	1,1
0,9	1,3	MT	0,2	2,5	MT	0,7	2,0
-0,8	-1,5	NL	-2,8	-0,3	NL	-2,3	-0,8
-0,1	-0,3	PL	-2,3	1,7	PL	-1,5	0,9
-0,8	0,1	PT	-1,2	1,4	PT	-0,7	0,9
0,3	-0,7	RO	-3,2	1,9	RO	-2,2	0,9
0,5	0,0	SE	-1,2	1,2	SE	-0,7	0,7
-0,3	-1,5	SI	-3,2	0,2	SI	-2,5	-0,5
-0,4	0,3	SK	-1,7	2,2	SK	-0,9	1,5
0,7	-0,7	UK	-1,9	0,6	UK	-1,4	0,1

Note: The output gap based on the PF methodology (PF Gap) and on the panel estimation ("plausibility tool" projection), including the lower and upper bounds for the RMSE68 and RMSE90 criteria.
Source: Commission autumn forecast 2016.

Table II.3.2: **Output gap flagged by the "plausibility tool" - Year 2016b**

		RMSE90			RMSE68		
PF Gap	PT Projection	MS	Lower Bound	Upper Bound	MS	Lower Bound	Upper Bound
-0,8	-1,6	AT	-2,9	-0,3	AT	-2,4	-0,8
-0,6	-0,6	BE	-1,4	0,3	BE	-1,1	-0,1
-0,2	0,4	BG	-2,2	3,1	BG	-1,2	2,0
-0,8	-1,8	CY	-3,2	-0,4	CY	-2,7	-1,0
0,2	1,5	CZ	0,6	2,5	CZ	0,9	2,1
-0,1	0,3	DE	-0,8	1,3	DE	-0,4	0,9
-1,4	-1,1	DK	-2,4	0,1	DK	-1,9	-0,4
0,3	0,9	EE	-0,8	2,7	EE	-0,1	2,0
-9,8	-5,1	EL	-10,8	0,6	EL	-8,6	-1,7
-1,8	-2,3	ES	-4,4	-0,3	ES	-3,6	-1,1
-1,8	-2,5	FI	-3,6	-1,4	FI	-3,2	-1,8
-1,3	-0,9	FR	-1,9	0,1	FR	-1,5	-0,3
-1,3	-2,0	HR	-2,7	-1,2	HR	-2,4	-1,5
0,2	1,5	HU	0,0	3,1	HU	0,6	2,5
0,0	0,0	IE			IE		
-1,7	-2,2	IT	-2,9	-1,5	IT	-2,6	-1,8
0,8	-0,3	LT	-2,7	2,1	LT	-1,8	1,1
-1,0	-2,6	LU	-4,9	-0,3	LU	-4,0	-1,2
1,6	-0,2	LV	-2,2	1,9	LV	-1,4	1,1
1,6	2,0	MT	-0,5	4,6	MT	0,5	3,6
-0,8	-1,6	NL	-2,7	-0,4	NL	-2,2	-0,9
-0,3	0,8	PL	-1,3	3,0	PL	-0,5	2,1
-0,6	-0,7	PT	-2,4	1,0	PT	-1,7	0,4
-0,1	0,6	RO	-2,2	3,4	RO	-1,1	2,3
0,2	-0,1	SE	-1,3	1,2	SE	-0,8	0,7
-0,4	-1,0	SI	-2,6	0,6	SI	-2,0	0,0
-0,3	-0,8	SK	-2,6	1,1	SK	-1,9	0,4
0,5	-0,3	UK	-1,4	0,8	UK	-0,9	0,4

Note: The output gap based on the PF methodology (PF Gap) and on the panel estimation ("plausibility tool" projection), including the lower and upper bounds for the RMSE68 and RMSE90 criteria.
Source: Commission spring forecast 2017.

Table II.3.3: **Output gap flagged by the "plausibility tool" - Year 2017**

		RMSE90			RMSE68		
PF Gap	PT Projection	MS	Lower Bound	Upper Bound	MS	Lower Bound	Upper Bound
-0,2	-0,5	AT	-1,8	0,8	AT	-1,3	0,3
-0,3	0,3	BE	-0,7	1,2	BE	-0,3	0,8
0,0	1,5	BG	-1,2	4,1	BG	-0,1	3,1
1,3	0,3	CY	-1,1	1,7	CY	-0,6	1,2
0,9	1,9	CZ	0,6	3,1	CZ	1,1	2,6
0,0	1,0	DE	-0,1	2,0	DE	0,3	1,6
-0,8	-0,6	DK	-1,8	0,7	DK	-1,3	0,2
1,8	1,4	EE	-0,3	3,0	EE	0,4	2,4
-7,7	-4,4	EL	-10,0	1,3	EL	-7,8	-1,0
-0,1	-1,0	ES	-3,1	1,0	ES	-2,3	0,2
-0,7	-1,5	FI	-2,6	-0,4	FI	-2,2	-0,9
-0,8	-0,2	FR	-1,2	0,8	FR	-0,8	0,4
0,6	0,0	HR	-0,8	0,7	HR	-0,5	0,4
1,5	2,1	HU	0,7	3,6	HU	1,2	3,0
0,0	0,0	IE			IE		
-0,6	-1,7	IT	-2,5	-0,9	IT	-2,2	-1,2
2,4	0,9	LT	-1,6	3,4	LT	-0,6	2,4
-0,4	-1,1	LU	-3,4	1,3	LU	-2,5	0,4
2,3	1,0	LV	-1,1	3,1	LV	-0,2	2,3
1,1	1,9	MT	-0,4	4,2	MT	0,5	3,3
0,2	-0,4	NL	-1,4	0,7	NL	-1,0	0,3
0,6	1,5	PL	-0,7	3,6	PL	0,2	2,8
0,4	0,2	PT	-1,6	2,1	PT	-0,9	1,4
0,7	1,1	RO	-1,8	3,9	RO	-0,7	2,8
0,2	0,4	SE	-0,8	1,6	SE	-0,3	1,1
1,8	0,2	SI	-1,7	2,1	SI	-1,0	1,4
0,0	0,5	SK	-1,2	2,3	SK	-0,5	1,6
0,6	0,0	UK	-1,3	1,3	UK	-0,8	0,8

Note: The output gap based on the PF methodology (PF Gap) and on the panel estimation ("plausibility tool" projection), including the lower and upper bounds for the RMSE68 and RMSE90 criteria.
Source: Commission autumn forecast 2017.

Box II.3.2: The application of discretion in the autumn 2017 fiscal surveillance exercise.

In the recitals of the Council Recommendations of 11 July 2017 the Commission's intended treatment of Member States for which the matrix implies a fiscal adjustment of 0.5% of GDP or above was highlighted. The recitals state the following: "[...], the assessment of the 2018 Draft Budgetary Plan and subsequent assessment of 2018 budget outcomes will need to take due account of the goal of achieving a fiscal stance that contributes to both strengthening the ongoing recovery and ensuring the sustainability of [Member State]'s public finances. In that context, the Council notes that the Commission intends to carry out an overall assessment in line with Regulation (EC) No 1466/ 97, in particular in the light of the cyclical situation of [Member State]."

The Commission can exercise a degree of discretion when considering departures from the fiscal adjustments implied by the matrix. While compliance continues to be assessed with respect to the matrix-based requirement as indicated in the Recommendations, the Commission can exercise some discretion when assessing the compliance with the SGP of a Member State that is flagged by quantitative indicators as (at risk of) significantly deviating from its required adjustment. In fact, the so-called overall assessment might eventually conclude that a Significant Deviation Procedure is not warranted even in the event of the significant deviation threshold of 0.5% of GDP being exceeded with respect to the matrix-based requirement. The legal basis can be found from the specific terms of Article 6(3) of Council Regulation (EC) No 1466/97, whereby the overall assessment is linked to precise quantitative criteria without being limited to those criteria, which allows for other elements to be taken into account.

Discretion is conceived as a mean to tackle a specific situation in a time of atypical and incomplete economic recovery. As highlighted in the Commission autumn forecast 2017, the current recovery is strengthening but remains atypical and incomplete. Specifically, there is persistent labour market slack, core inflation remains unusually subdued, and the large current account surplus, in excess of its fundamental level, indicates the persistence of a domestic demand shortfall. Lastly, the recovery is supported by ECB's accommodative monetary policy. This becomes even more relevant in the context of monetary policy on a gradual road towards normalisation.

A structured and holistic assessment of a comprehensive set of economic indicators allows the identification of cases where an effort below that required by the matrix could be deemed adequate. For Member States in (at risk of) a significant deviation from the matrix requirements for 2018, the overall assessment may include a methodical scrutiny of its stabilisation and sustainability needs with the ultimate goal of achieving an appropriate fiscal stance at the Member State level. This is based on a structured and systematic analysis of a comprehensive set of economic indicators that is intended to ensure predictability and equal treatment among Member States.

The analysis encompasses both an assessment of sustainability and stabilisation challenges. A thorough analysis of debt levels as well as short and medium term sustainability challenges allow determining if the Member State presents sustainability challenges or not. In parallel, stabilisation needs are assessed considering the position of the economy in the economic cycle and the possible existence of inflationary pressures. In particular, the indication provided by the output gap from the common methodology is complemented by alternative measures of the spare capacity of the economy. In addition, indicators of inflationary pressures can also be taken into account.

The Commission concluded that a fiscal adjustment that departs from the requirement can be deemed adequate for Italy and Slovenia, provided that they effectively ensure such a fiscal adjustment in 2018. The analysis considers the following sequential arguments.

- In cases when short-term fiscal sustainability challenges are identified, no discretion is warranted. No Member State is in this situation now.

(Continued on the next page)

Box (continued)

- In cases when the economic recovery of the Member State is considered sufficiently robust, no discretion is warranted either, as for Belgium, France, and Portugal.

- For Member States where the recovery appears still fragile or a too large fiscal tightening could jeopardise it, as in the cases of Italy and Slovenia, a fiscal adjustment that departs from the requirement can be deemed adequate. However, if these Member States are also facing sustainability needs in the medium-term and/or have a debt-to-GDP ratio above 60%, an important provision is that they should ensure the effective delivery of a reasonable fiscal adjustment. The latter could be roughly proxied by at least half of the requirement from the matrix. Providing such a cap responds to the need of striking the right balance between the Member State's stabilisation and sustainability needs. Nevertheless, full compliance with this fiscal adjustment is required. Effectively ensuring a minimum fiscal adjustment is essential in particular for Member States not respecting the debt reduction benchmark prima facie and therefore facing the possibility of a debt-based Excessive Deficit Procedure.

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Part III

Impact of fiscal policy on income distribution

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KEY FINDINGS

This part analyses the role of fiscal policy on inequality of *incomes*, leaving aside the equally-important dimension of inequality of opportunities or wealth. As a novelty, the analysis not only captures the *direct impact* of the tax and benefit system on disposable income. It also tries to assess the *total effect* of fiscal policy on inequality by taking into account behavioural and macroeconomic feedback effects, which can reinforce or offset the direct effect. Overall, the chapter makes clear that fiscal policy needs to be carefully designed to balance equity, stabilisation and efficiency considerations, taking into account potentially harmful indirect effects.

Fiscal policy has mitigated the increase in income inequality coming from market forces

- While income inequality in the EU on average was in 2014 higher than in 1980, its increase mainly results from a level shift of inequality in the 1990s. Since 2000, inequality of market/gross income (i.e. before taxes and transfers) further increased to reach the same levels as the US in 2014, whereas inequality of disposable/net income (i.e. after taxes and transfers) has remained broadly unchanged and clearly below the levels of other advanced economies.

- Government redistribution via the tax and benefit system had a *direct effect* in reducing income inequality in the EU by almost one-third. The size of government redistribution has increased significantly in recent decades and was in 2014 almost twice as great as in the US. Income redistribution appears to run from high- to low- and middle-income households, reflecting the progressivity of the tax and benefit system.

- Panel data analysis reveals that the *total effect* of fiscal policy on inequality reduction is smaller than its direct effect, mostly due to the behavioural responses and macroeconomic effects. Our findings show that only some expenditure items, in particular education and health spending, as well as sickness, disability, family and child benefits, significantly reduced income inequality in the EU on average over the period 1980 to 2014.

Fiscal policy is also important in stabilising income and consumption across income deciles over the economic cycle

- The tax and benefit system provides a mechanism which automatically, i.e. at unchanged policies, smooths income and consumption over the economic cycle. During downturns, government revenue decreases while public spending stays the same or slightly increases. During booms, government revenues increase while public spending stays the same or slightly decreases.

- The degree of *direct* automatic stabilisation is fairly high in the EU in 2014 according to new simulations based on EUROMOD. Around 33% of disposable income is absorbed in the EU on average by the tax and benefit system following a shock to market income, ranging from 20% in Bulgaria to 45% in Austria. Consumption is absorbed by even 70% in the EU on average due to the tax and benefit system and the saving behaviour, ranging from 64% in Bulgaria to 75% in Ireland. The more progressive the tax and benefits system, the higher its stabilisation effect.

- The *total* automatic stabilisation effect is smaller than its direct effect according to new simulations for Italy based on QUEST. The results show that the size of income (consumption) stabilisation declines to 29% (55%) according to QUEST. This can be explained by the impact of behavioural and macroeconomic effects, which reduce the degree of shock absorption of automatic stabilisers.

1. INTRODUCTION

Income inequality has been rising in several countries of the European Union (EU) over the past decades. Although inequality is, on average, still lower in the EU than in other advanced economies, the increased inequality in several EU Member States has fuelled a perception of unfair opportunities and burden-sharing within societies. That perception has been amplified by the impact of the Great Recession, ([42]) which resulted in high unemployment, low growth together with a dire outlook in particular for the younger generation in some EU Member States.

Excessively high income inequality can be harmful for economies. Mainstream economic theory points to a trade-off between equity and efficiency. Policies aiming at a more equal society can distort incentives for work, education, entrepreneurship and investment, which in turn hamper economic performance. ([43]) However, excessively high income inequality can have negative economic effects through different channels, namely by: (i) weakening aggregate demand as poorer households tend to consume a higher share of their income than richer ones; ([44]) (ii) contributing to an underinvestment in human capital, hampering social mobility and lowering labour productivity if access to quality education primarily depends on income; ([45]) (iii) leading to a misallocation of resources and rent-seeking if preferences of a society are shifted towards excessive regulation or inefficiently high taxes on capital. ([46])

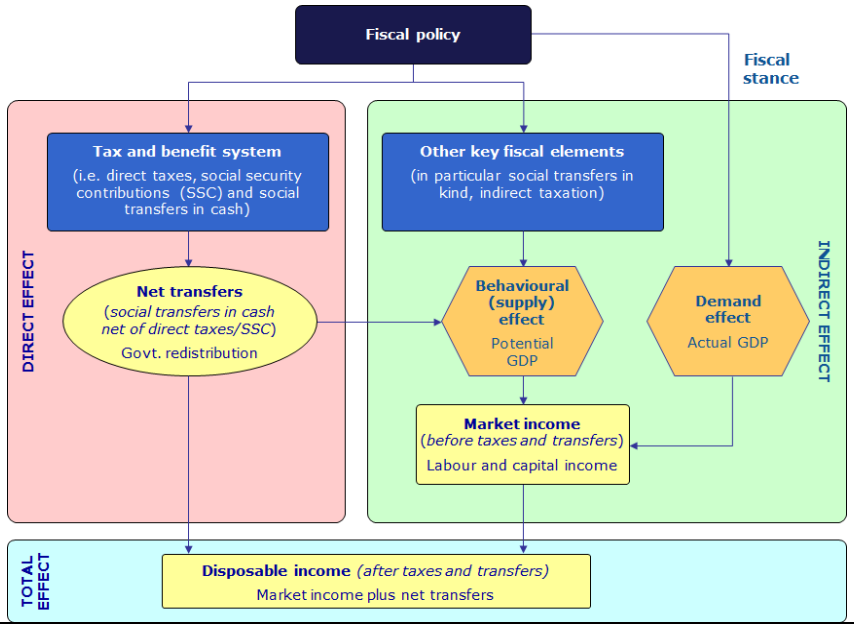
Fiscal policy is a key instrument for governments to affect the income distribution (Graph III.1.1.). Fiscal policy can have a *direct* impact on the disposable income of households through the design of the tax and benefit system. In addition, fiscal policy can also have an *indirect* effect on income distribution via two main channels. First, fiscal policy can cause behavioural responses of firms, workers and consumers, which mainly affect labour supply and capital accumulation and thus impact on market income (i.e. before tax and benefits). ([47]) For instance, higher social transfers or taxes can weaken incentives to work and to invest in skills, increase unemployment and ultimately lead to higher market income inequality. Second, fiscal policy can cause macroeconomic feedback effects. For instance, high debt can weigh on growth ([48]) and/or expose the economies to risk of deeper recessions ([49]), while fiscal policy can also mitigate skill degradation in a depressed economy ([50]). Overall, the indirect effects of certain policies may offset some of their inequality-mitigating direct effect. ([51]) Hence, fiscal policy plays a crucial role in contributing to the key functions of the government as defined by Musgrave, ([52]) by enabling equal opportunities and redistributing income and wealth (equity function), protecting incomes against economic downturns (stability function) and setting-up incentive-compatible framework conditions (efficiency function).

Apart from fiscal policy, many other factors and policies can impact the income distribution. ([53]) For instance, technological changes (sometimes associated with globalisation patterns) can increase the demand for high-skilled employees, therefore increasing their wage premium and amplifying wage dispersion. Demographic factors, such as ageing and the composition of households, tend to contribute to a rise in income inequality. ([54]) There seems to be no conclusive evidence on the impact of market regulation on inequality. ([55])

Tackling inequality is mainly a national prerogative in the EU. Depending on the preferences within societies and in line with the principle of subsidiarity, Member States decide how to address inequality. At the same time, social issues are a priority for the EU, as reaffirmed for

([42]) Juncker (2015).
([43]) Okun (1975).
([44]) Galor and Zeira (1993).
([45]) Stiglitz (2012).
([46]) Alesina and Rodrik (1994), Alesina and Perotti (1996).
([47]) Conesa and Krueger (2006), Heathcote et al. (2017).
([48]) Chudik et al. (2017).
([49]) Jordà et al. (2016).
([50]) DeLong and Summers (2012).
([51]) The assessment of behavioural and macroeconomic effects of tax reforms is also a prominent feature in the political and public debate. Dynamic scoring techniques provide a useful tool for these analyses (see Mankiw and Weinzierl 2006, Barrios et al., 2017).
([52]) Musgrave (1959).
([53]) Förster and Tóth (2015).
([54]) Lu et al. (2011), Peichl et al. (2010).
([55]) OECD (2011a).

Graph III.1.1: **Main transmission channels from fiscal policy to inequality - schematic illustration**



Note: The graph presents a schematic overview of the main transmission channels linking fiscal policy and (disposable/market) income inequality. Three channels can be distinguished, namely direct (left upper panel), indirect (right upper panel) and total (bottom panel) effects. The direct effects represent the impact of the tax and benefit system on disposable income inequality, which is analysed in greater detail in Sections III.3.1. and III.4.1. The total effects of fiscal policy on disposable income inequality are investigated in Sections III.3.2. and III.4.2.
Source: Authors' illustration.

instance in the European Pillar of Social Rights, which sets out a number of key principles and rights to support fair and well-functioning labour markets and welfare systems. ([56]) The European Semester provides the monitoring framework at EU level and the 2018 Annual Growth Survey highlights the importance of tackling inequalities, including through the design of national tax and benefit systems. ([57]) The reduction of inequality is also a top priority of G20 Leaders. ([58])

While inequality has several facets, this report analyses the impact of fiscal policy on the income distribution in the EU Member States. The centre of interest lies on inequality of *incomes*, resulting from the key fiscal, economic and societal factors listed above. This part does not address the equally important question on the effects of inequality of *opportunities*, which are associated with factors beyond the individual's control, such as social background or ethnicity. ([59]) Inequality is measured here by the distribution of *income across households*, leaving aside the also important questions of inequality *within households* or the distribution of *wealth*. ([60]) Finally, fiscal policy is mainly understood as governments' tax and benefit systems (i.e. social transfers in cash, social security contributions and direct taxes), but some consideration is also given to indirect taxation and non-monetary, in-kind elements such as the provision of education.

Against that background, the present part addresses the following three questions:

- ***First, which fiscal policy instruments are effective in reducing income inequality according to the literature?*** Chapter III.2. summarises the existing evidence and theories by type of fiscal policy, distinguishing between direct and indirect effects. It concentrates on the tax and benefit system, i.e. social transfers

([56]) European Commission (2017a).
([57]) https://ec.europa.eu/info/sites/info/files/2017-comm-690_en_0.pdf
([58]) G20 Leaders (2014).
([59]) Roemer (1998).
([60]) See European Central Bank (2016) summarising the findings on household net wealth for 18 euro area countries derived from the second wave of the Household Finance and Consumption Survey (HFCS).

in cash, direct taxes and social security contributions (Section III.2.1.), social transfers in kind (Section III.2.2.) and indirect taxes (Section III.2.3.).

- ***Second, has fiscal policy been successful in reducing income inequality in the EU?*** Chapter III.3. provides new empirical evidence on the inequality-mitigating impact of fiscal policy for Member States. It first analyses the *direct* effects of the tax and benefit systems on income inequality using household data over the period 2004 to 2014 (Section III.3.1.). It then analyses the *total*, i.e. direct and indirect, effects using a panel regression approach for the years 1980 to 2014 (Section III.3.2.).

- ***Third, is fiscal policy an effective tool in automatically stabilising households' income and consumption across deciles if economies are hit by a large economic shock?*** Chapter III.4. analyses the automatic (as opposed to ad-hoc or discretionary) stabilisation properties of fiscal policy in smoothing income and consumption following a large economic shock. It first analyses the *direct* stabilisation effect of the tax and benefit system on income and consumption using the microsimulation model EUROMOD and household data for the year 2014 across 28 Member States (Section III.4.1.). It then analyses the *total*, i.e. direct and indirect, stabilisation effect of fiscal policy using the macrosimulation model QUEST (Section III.4.2.).

2. MAIN EFFECTS OF FISCAL POLICY ON INCOME INEQUALITY: A LITERATURE REVIEW

The literature review on the effects of fiscal policy on the income distribution identifies three key policy drivers, namely (i) the tax and benefit system (i.e. social transfers in cash, direct taxes and social security contributions) (Section III.2.1.), (ii) social transfers in-kind, such as the provision of education (Section III.2.2.) and (iii) indirect taxes, i.e. mainly consumption taxes such as VAT (Section III.2.3.). Other components of fiscal policy, such as corporate income, environmental, property or inheritance taxes as well as other public expenditures are not considered here.

A distinction has to be made between direct and indirect effects of fiscal policy (Graph III.1.1). Governments have a *direct* impact on the income distribution through the design of the tax and benefit system. They also *indirectly* affect the income distribution by causing behavioural responses and macroeconomic effects, which, in turn, influence economic outcomes and thereby result in distributive effects. ([61]) That raises the question of how debt is financed, which is an important determinant of the total effects of fiscal policy. For instance, a tax hike necessary to finance benefits can distort economic activity, lower output, reduce labour income and finally affect disposable income.

Apart from fiscal policy, many other factors and policies can affect the income distribution, which are not further analysed here (Graph III.2.1). ([62]) For instance, technological changes (sometimes associated with globalisation patterns) can increase the demand for high-skilled employees, therefore increasing their wage premium and amplifying wage dispersion. There seems to be no conclusive evidence on the impact of market regulation on inequality. ([63]) Demographic factors, such as ageing and the composition of households, can contribute to a rise in income inequality. ([64]) Finally, developments in the political process have also been identified as drivers for inequality.

2.1. DISTRIBUTIVE EFFECTS OF THE TAX AND BENEFIT SYSTEMS

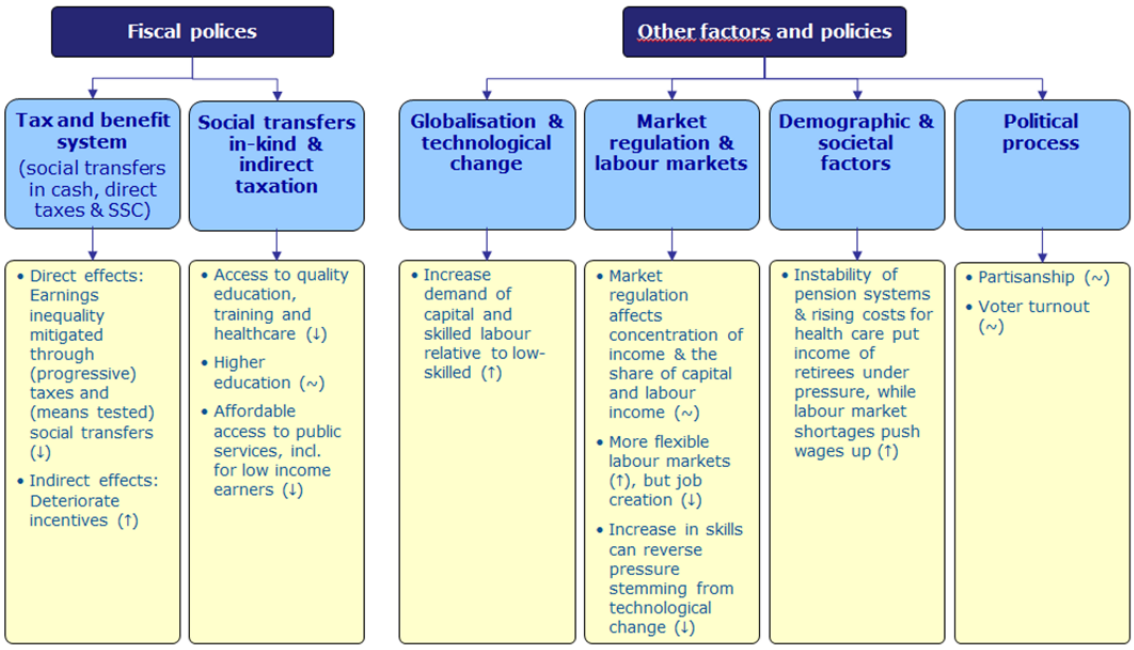
2.1.1. Direct redistributive effects of the tax and benefit systems

The direct redistributive effects of the tax and benefit system depend largely on the size and progressivity of its components. ([65]) Focusing on the *direct* effects from the tax and benefit system means to ignore the impact from *indirect* effects. The tax (benefit) system is considered to be progressive if the taxes paid (benefits received) increase (decrease) with increasing disposable income. Conversely, the tax (benefit) system is regressive if the taxes paid (benefits received) decrease (increase) with increasing disposable income.

- **The progressivity of social transfers varies a lot across components.** Old-age pensions, which account for a significant part of the cash transfers, exhibit a low progressivity in many countries, and they often redistribute income over the life-cycle rather than within the life-cycle and across households. ([66]) By contrast, family and housing benefits appear to be more progressive cash transfers, though their redistributive impact is often limited due to their small size. Disability and unemployment benefits tend to reduce income inequality, whereas their degree of progressivity depends to a large extent on the country-specific design. The redistributive impact of cash transfers not only depends on the levels of those benefits, but also on their mix and specific design. For instance, some countries can achieve a sizeable redistributive impact despite a relatively small cash transfer by focusing on means-tested benefits.

([61]) For instance, fiscal policy also depend on the sustainability of government finances, since a high government debt weighs on growth (Chudik et al., 2017) and/or expose economies to deeper recessions in case of a financial crisis (Jordà et al., 2016). At the same time, fiscal policy may mitigate skill degradation in a depressed economy (DeLong and Summers, 2012).
([62]) Förster and Tóth (2015).
([63]) OECD (2011a).
([64]) Lu et al. (2011), OECD (2011a) and Peichl et al. (2010).
([65]) Some countries with a small tax-benefit system (relative to GDP) can achieve the same redistributive impact as countries with much higher taxes and transfers, because they rely more on progressive taxation and means-tested social transfers. For a discussion on how to enhance the distributive impact of taxation policies see for example Bastagli et al. (2012).
([66]) Joumard et al. (2012), Arnold et al. (2016), IMF (2017).

Graph III.2.1: **Stylised overview of main drivers of income inequality**



Note: The figure provides a stylised overview of the main drivers of income inequality identified in the literature. ↑(↓) stands for inequality-increasing (-decreasing) effect, while ~ points to inconclusive results. Particular importance is given to drivers, which have been identified for EU countries. SSC refers to social security contributions.
Source: Author's illustration inspired by OECD (2015).

- **The redistributive impact of taxes is higher, the more progressive the (effective) tax rate**. ([67]) In general, direct taxes tend to be progressive in most countries. ([68]) The personal income tax is the most progressive tax in most Member States. On the other hand, social security contributions tend to be regressive in most countries. The progressivity of labour taxes (including social security contributions and personal income tax associated with labour income) has increased in many countries since 2000, as social security contributions for low-income earners have been cut mainly to reduce the cost of labour. ([69])

Cash transfers tend to have a larger direct redistributive impact than direct taxes According to evidence based on averages across the OECD from the pre-Great Recession period, around three-quarters of the reduction in inequality of income comes from transfers and the rest from direct taxation. ([70])

2.1.2. Total redistributive effects of the tax and benefit systems

A solid impact assessment needs to take into account the total, i.e. direct and indirect, effects of the tax and benefit system on income inequality. The design of the tax and benefit system can trigger a number of adverse indirect effects owing to macroeconomic feedback effects and behavioural adjustments on the contributor (taxpayers) or recipient side (e.g. social assistance beneficiaries). Those behavioural effects can act as a disincentive to work (e.g. unemployment benefits) ([71]) or weaken acquisition of skills and

([67]) See Immervoll and Richardson (2011), Kenworthy and Pontusson (2005).
([68]) Despite the progressive nature of tax legislation, high income households sometimes have better means to identify and make use of tax loopholes. For a review of the literature on the theory of optimal taxation see Saez (2004).
([69]) See Causa et al. (2016). Other authors that analyse the impact of indirect taxation on income inequality are Wagstaff et al. (1999), O'Donoghue et al. (2004) who find direct taxes to be significantly progressive; Belot and van Ours (2004), Causa et al. (2016).
([70]) See Joumard et al. (2012).
([71]) This is can affect the decision whether to work or not or how many hours to work (see for instance Abbring et al., 2005, Heathcote et al., 2017).

lower investment (e.g. higher taxes) ([72]) and ultimately lead to higher inequality. ([73])

The most famous distortion is likely the so-called unemployment trap. If the tax and benefit system is not well-designed, unemployed individuals can face a disincentive to take up upcoming job offers. Over the medium- to long-term, it can thus have an impact on labour supply and undo the reduction in inequality brought by the direct cash contribution.

Higher taxes can trigger behavioural responses contributing to higher inequality. As mentioned above, high debt levels can put the sustainability of the tax and benefit system at risk. At the same time higher taxes (which can become necessary to finance the tax and benefit system) can also contribute to higher unemployment, for instance if they lead to competitiveness losses for firms (e.g. for social contributions or when higher labour income taxes are translated into higher wages). This holds in particular if tax rates are already quite high. ([74]) The associated employment losses can cause higher inequality, even if the tax system is progressive. In addition, empirical evidence shows that higher tax wedges ([75]) tend to have no clear-cut inequality-mitigating effect, although they are intended to favour lower segments of the labour markets. Depending on national labour market institutions, high-wage workers may be able to pass on the tax burden to their employers, while the overall tax wedge effects can considerably affect unemployment. ([76]) High taxes and weaknesses in public administrative capacity can also increase income tax evasion, which, in turn, can have indirect effects on income inequality. Simulations suggest that tax evasion in Greece, Hungary and Italy seem to lead to a significant loss of tax receipts and to higher income inequality. ([77])

The potential disincentive effects from cash benefits depend on the whole set of labour market institutions. ([78]) The literature suggests that social transfers, in particular unemployment benefits, can weaken work incentives and increase unemployment duration and total unemployment, ([79]) which, in turn, can potentially increase inequality. At the same time, the empirical evidence shows that the disincentive effects of unemployment benefits (for instance regarding the durat ion of benefits and the net replacement rates) may vary a lot across countries. ([80]) In addition, unemployment benefit systems operate within a broader context given by the existing economic and institutional framework. Incentives to work are notably influenced by the overall tax and benefit system and in particular by the combination of other benefits such as social assistance, housing benefits, family benefits and in-work benefits. Individual job-search effort and availability are also influenced by the provision of active labour market policies as well as by the overall economic and labour market conditions.

There is nevertheless evidence that a careful design of the tax and benefit system can ultimately contribute to lower income inequality. ([81]) This could be for instance achieved by favouring fiscal instruments that are both progressive and less harmful to job creation, as well as by combining them with other policies that avoid disincentive effects, such as means-tested unemployment benefits combined with sound active labour market policies.

2.2. DISTRIBUTIVE EFFECTS THROUGH TRANSFERS IN KIND

If well-designed and financed in a growth-friendly manner, transfers in kind can contribute to a reduction of market income

([72]) Put differently, some policies that have adverse effects on equity in the short run could be redistributive in the longer run through job creation and incomes (see Muinelo-Gallo and Roca-Sagalés, 2013; Biswas et al., 2017 and Arnold et al., 2016).
([73]) Empirical evidence also suggests that distributive expenditures and direct taxes can reduce GDP growth, hence potentially job creation. While links between growth and inequality are not straightforward, a hampered job creation ultimately contributes to a rise in inequality.
([74]) See e.g. Trabant and Uhlig (2011) for a recent assessment of the Laffer curve.
([75]) The average tax wedge measures the extent to which tax on labour income discourages employment. It is defined as the ratio between the amount of taxes paid by an average single worker (a single person at 100% of average earnings) for the employer (measured in per cent of labour costs).
([76]) See Checchi and Garcia-Penalosa (2010).
([77]) Matsaganis et al. (2010).
([78]) See, for the US case, Chetty et al. (2013).
([79]) Abbring et al. (2005).
([80]) See, for instance, Jenkins and Garcia-Serrano (2004), Hagedorn et al. (2015) and Schmitz and Steiner (2007).
([81]) Doerrenberg and Peichl (2012).

inequality. Social transfers in-kind correspond to individual goods and services supplied or reimbursed to households, typically by the general government. They include transfers of individual non-market goods and services produced by the general government, particularly education and health, as well as benefits in kind which fall into the category of social protection, such as housing benefit, child care or medication. The provision of transfers in kind – notably those linked to human capital – can improve social mobility and skills, possibly reducing inequality of (future) earnings.

The distributive effects of transfers in kind typically take more time to materialise than cash transfers and depend largely on the quality and the beneficiaries of those policies. Those services also need to be financed, and taxation can bring indirect behavioural effects such as disincentives for work and economic activity, some of them triggering more market inequality. Some channels through which the provision of education, training and health services can affect income inequality over the medium- or long-run are the following:

- **Education (early childhood and schooling):** In most OECD countries, students who attended early (pre-school) education tend to perform better than their peers, even after accounting for the socio-economic background. ([82]) Participation in quality-early childhood education is a key determinant of successful school attendance, especially for children from disadvantaged socio-economic backgrounds. Early school leavers are also more likely to be inactive or unemployed or to have less stable and remunerative jobs. Disadvantages from early life tend to persist throughout life, as people with lower qualifications are also less likely to engage in adult learning. Providing quality education can allow such traps to be avoided. Some of those services, such as increased childcare provision and early-learning education can not only help to enhance skills of the future labour force, but also increase labour market participation in particular of women.

- **Active labour market policies and vocational training:** Well-designed active labour market policies targeted at rapid reallocation of dismissed workers into new employment in combination with a social safety net during the transition period can smooth consumption and be compatible with less intense business cycle fluctuations and faster adjustment processes (but also more volatile government spending). Vocational training, as well as lifelong re-training opportunities help to mitigate the negative effect of skill-biased technological change and may act against labour market hysteresis caused by severe downturns. ([83])

- **Health care and long-term care** can affect labour supply and productivity at the individual level. The health status of individuals is found to be a strong determinant of their labour market participation. ([84]) As low income earners tend to have a worse health status than high income earners, health care can improve their labour market participation, thereby reducing income inequality. In addition, health care can help limit health-related productivity losses at the individual level and is found to be a determinant allowing older people to remain economically active. ([85])

Evidence suggests that the provision of affordable public services can have a non-negligible impact on reducing the immediate income inequality of households. ([86]) Microsimulation models based on 2009 data for 21 Member States show that the delivery of public services benefits the low income earners in particular. ([87]) The direct redistributive power of

([82]) See OECD (2016) based on the PISA 2012 survey.

([83]) See for instance OECD (2011b).
([84]) See Suhrcke et al. (2006) and Mackenbach et al. (2007).
([85]) There is indeed evidence for a role for sickness in explaining the decision to retire from the labour force and exclusion from it. However, the importance of health in predicting exit from the labour force is influenced by the employment and benefits regime in place. Some policies encourage people to register as unable to work through illness rather than as unemployed (see e.g. Kalwij and Vermeulen, 2005).
([86]) See Aaberge et al. (2017).
([87]) The authors calculate a "monetary value" of the delivery of health care, long-term care, education and childcare for the benefiting households. To account for the fact that the receipts of public services like education and healthcare are associated with particular needs, the consumption needs are also adjusted accordingly (see Table III.A1.1 in Annex III.1).

the delivery of health care, long-term care, education and childcare may strengthen the distributive power of transfers in cash by around one-third. The effects of public housing subsidies, education and health care have also been evaluated in another study for Belgium, Germany, Greece, Italy and the United Kingdom. It concludes that the income inequality is smaller if one takes those public services into account, also when consumption needs are adjusted to reflect the provision of healthcare and education. ([88])

Despite the possible benefits of transfer in kind, their potentially distortive features must not be neglected. First, transfers in kind need to be supported by sufficient financing. Transfers in kind amounted to 13% of GDP in the euro area and in the EU in 2016, almost one-third of primary expenditures. This figure hides large differences across Member States, with transfers in kind ranging from 6.5% of GDP in Cyprus to 19.1% of GDP in Sweden. Securing a constant financing may require a high level of taxation with the possible negative feedback effect on growth and, indirectly, unemployment and inequality. Second, an efficient implementation of transfers in kind can be challenging, since they can create undesirable incentives of potential recipients ([89]) and/or can be ill-designed due to political-economy considerations. ([90])

2.3. DISTRIBUTIVE EFFECTS FROM INDIRECT TAXATION

Indirect taxes can be an important component of government revenues. They include in particular consumption taxes (VAT and excise duties). Together with income taxes, VAT is typically the biggest source of government revenues in EU Member States.

Consumption taxes (VAT and excise duties) are generally regressive, meaning that the share of those taxes as a percentage of disposable income is higher for low-income earners. ([91]) However, consumption taxes may be either close to proportional or slightly progressive when their effects are measured as a percentage of expenditure instead of disposable income. ([92]) This is because high-income households tend to spend relatively more on high-tax products and services than low-income households.

Reduced rates on VAT are not the most efficient tool to address income inequality. Reduced VAT rates on specific goods and services are frequently used to alleviate the regressive nature of the VAT. However, such policies appear to have a clear redistributive impact, since the high-income households tend to spend more in absolute terms on these products than the low-income households. Income-related benefits are therefore considered a more efficient way of increasing the disposable income of low-income households than reduced VAT rates. ([93])

Depending on the overall tax mix, there can be indirect redistributive effects through competitiveness and labour supply. For example, shifting the tax burden from income taxes (progressive) to consumption taxes (regressive) can have adverse effects on inequality in the short run. They can be, however, outweighed by improved employment opportunities, arising as a result of more favourable taxation of labour: effects on job creation can be positive in the medium run through competitiveness gains, and in the long run through increased labour supply. ([94]) General equilibrium simulations show that an increase in consumption tax, accompanied by a reduction in the tax burden on labour, would ultimately redistribute income from capital owners to wage earners. ([95])

([88]) See Paulus et al. (2010); see also Förster and Verbist (2012) for the childcare benefits in kind.
([89]) A strand of literature argues that transfers can give wrong incentives to potential recipients in order to receive the transfer (Bruce and Waldman, 1991).
([90]) The political-economy inspired literature argues that transfers can be inefficient, since they can lead to an inefficiently high number of projects due to the common-pool problem (Weingast et al., 1981). Similarly, policy-makers may attribute too much weight to special interests in the design of transfers to improve their re-election probabilities (Coate and Morris, 1995).
([91]) See OECD (2014), O'Donoghue et al. (2004) and Decoster et al. (2010).
([92]) See also Graph III.A1.1 in Annex III.1 for 14 Member States; see also OECD (2015).
([93]) Mirrlees et al. (2011), Copenhagen Economics (2007), Kalyva et al. (2016), IMF (2014).
([94]) Causa et al. (2016). For a summary about the sign of the effect of tax reforms on economic growth and equality in disposable income see Joumard et al. (2012).
([95]) See Varga and in't Veld (2014) or Burgert and Roeger (2014). Further research related to tax shift and effects on income distribution can be found in Wöhlbier et al. (2016).

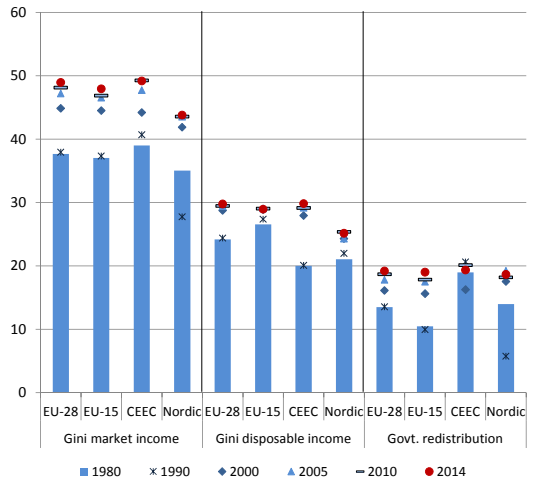
3. EFFECTIVENESS OF FISCAL POLICY IN REDUCING INCOME INEQUALITY IN THE EU: WHAT DO THE DATA SAY?

This chapter provides new empirical evidence on the impact of fiscal policy on income inequality across Member States. It first focuses on the *direct* impact of the tax and benefit systems (i.e. direct taxes, social security contributions and social transfers in cash) on income inequality using household data over the period 2004 to 2014 (Section III.3.1.). It then analyses the *total*, i.e. direct and indirect, impact of fiscal policy on inequality using a panel regression approach for the years 1980 to 2014 (Section III.3.2.). ([96]) Note that for data availability reasons, the analysis is limited to the years until 2014. ([97])

3.1. DIRECT EFFECTS THROUGH THE TAX AND BENEFIT SYSTEMS

While disposable income inequality is today higher in almost all Member States than in 1980, it has remained broadly stable since 2000 (Graph III.3.1). In the EU on average, the increase in inequality – if measured as the Gini index of market (i.e. before taxes and transfers) or disposable (i.e. after taxes and transfers) income – mainly results from a level shift in inequality in the 1990s. This is clearly the case for the Central and Eastern European countries (CEEC), where inequality soared after the end of the communist eras with the economic transition process. In the Nordic countries, inequality has also increased significantly in the 1990s; they are, however, still among the most equal societies around the world. In the EU-15, the increase of inequality between 1980 and 2000 mostly affected market income, while the rise in disposable income inequality was relatively small. Since 2000, market inequality has further increased, while disposable income inequality has remained broadly stable. Overall, government redistribution through the tax and benefit system therefore played a major role in mitigating the impact of the rise in market inequality. Since the 1980s, government redistribution in the EU on average has increased significantly and it is close to its historical peak in 2014, the latest available year of observation.

Graph III.3.1: **Developments of income inequality since 1980 for selected EU country groups**



Note: This graph shows the long-term evolution of the Gini index based on disposable/market income (in per cent) as well as government redistribution for selected EU country groups since 1980. Government redistribution is measured as the difference of the Gini index of market and disposable income. If data are not available for a specific year, the closest value is shown. Nordic (DK, FI, SE), EU-15 (EU Member States before 2004 enlargement) and CEEC (BG, CZ, EE, HU, LT, LV, PL, RO, SI, SK) are based on simple unweighted averages for the given countries.
Source: Own illustration using data from the Standardized World Income Inequality Database (SWIID) version 6.0 by Solt (2016).

3.1.1. Income inequality and redistribution since EU's eastern enlargement

The inequality of disposable income has remained lower in the EU than in other major advanced and developing economies since 2004 (see blue bars in Graph III.3.2). The Gini index of disposable income on average slightly increased in the EU-28 between 2004 and 2014. This reflects the higher inequality in the CEEC, which more than offset the decline in inequality in the EU-15. Nevertheless, according to the latest available data from 2014, disposable income inequality is still smaller in the EU-15 (28.9%) and EU-28 (30.4%) than in Japan (30.8%), Australia (31.8%), the United States (37.0%) and South Africa (57.3%).

The relatively low inequality of disposable income in the EU reflects the sizeable government redistribution, which is much

([96]) See Graph III.1.1 for an illustration of the direct, indirect and total effects.
([97]) According to the latest available data of Eurostat, the Gini index of the EU as a whole remained broadly stable in the years 2015 and 2015 (for the year 2015 see also European Commission, 2017b).

Box III.3.1: **Indicators of income inequality and redistribution through fiscal policy**

This box presents the indicators used here to measure income inequality and redistribution through fiscal policy.

The key indicators used here are calculated based on household data from the EU statistics on income and living conditions (EU-SILC) database. ([1]) EU-SILC is the major survey in the EU covering cross-sectional and longitudinal data on income, poverty, social exclusion and living conditions at the personal and/or household level (see Annex III.2 for a more detailed description). Like for every survey, the estimates of overall income inequality tend to be biased downwards, since surveys do not capture incomes of the extreme top of the distribution very well. ([2]) In addition, the information on the income distribution is only available for EU Member States, a limited time period and with a significant time lag, covering the period 2004 to 2014. ([3])

Indicators of inequality

A key measure for inequality is the Gini index. It considers the shape of the whole income distribution and takes values from 0 (perfect equality, i.e. every household has the same income) to 100 per cent (maximal inequality, i.e. the total income is concentrated on one household and all others have nothing). Higher values therefore point to a higher degree of inequality. ([4]) A key advantage of the Gini is that it is a well-established indicator, which is available for a relatively long time period and for many countries. A major drawback is that the Gini is little sensitive to changes at the very top and bottom of the income distribution.

In this section Gini indices are calculated based on market and disposable income. The Gini index based on *market* income represents inequality of households' total income *before* redistribution from taxes and transfers (sometimes also called *gross* inequality). The Gini index of *disposable* income measures income *after* redistribution from taxes and transfers (sometimes also labelled *net* inequality) (see Annex III.2 Table III.A2.1 for an overview of the specific components of disposable and market income). A distinction between the two concepts is useful to better understand the role of the markets and welfare systems. Households' observations are adjusted using the modified OECD equivalence scales to take into account the different consumption needs due to different size and age structure within a household. ([5])

To illustrate what a change of the Gini index can mean consider the following illustrative example. We assess the impact of a hypothetical increase of the monthly disposable household income by 100 EUR at 2013 prices in France and Italy for three different types of households, namely households with (i) low income (deciles 1 and 2), (ii) medium income (deciles 5 and 6) and (iii) high income (deciles 9 and 10). The findings reveal that a transfer to the low-income households would, ceteris paribus, decrease the Gini index by around 0.7 percentage point (Table III.3.a). The impact would be smaller (around 0.2 percentage point) if the transfer is given to the medium-income households. Finally, a transfer to the high-income households would increase the Gini by around 0.4 percentage point. The results are similar for France and Italy.

([1]) Data for the UK stem from the Family Resource Survey. The EU-SILC database only includes information for the period 2004 to 2014. This Chapter therefore relies on a second source of inequality data by Solt (2016) if a longer time period or a larger country sample is required.
([2]) Atkinson et al. (2011). On the impact of top incomes on inequality see e.g. Roine et al. (2009).
([3]) Note that this this period corresponds to the years of the EU-SILC database.
([4]) An indicator which tends to be closely correlated with the Gini index is the income share ratio S80/S20. It is defined as the ratio between the total income received by the population of the top 80% over the income of the lowest 20% of the income distribution.
([5]) The equivalised disposable income is defined as the total disposable income of a household divided by the number of household members converted into equalised adults. Household members are equalised or made equivalent by weighting each household member according to their age, using the so-called modified OECD equivalence scale (1.0 to the first adult; 0.5 to the second and each subsequent person aged 14 and over; 0.3 to each child aged under 14).

(Continued on the next page)

Box (continued)

Apart from the Gini index, two indicators measuring income share ratios are used. These indicators measure the ratio between the upper-bound value of the equivalised household disposable income of the ninth decile to that of the median income (S90/S50) and the median income to the upper-bound value of the first decile (S50/S10). The indicators help to better understand, which part of the income distribution is mainly responsible for the change in income inequality.

Table III.3.a: **Sensitivity of the Gini index to changes in household income – an illustrative example**

	France		Italy	
	Gini	*Change vs. SQ*	Gini	*Change vs. SQ*
Status-quo (SQ)	29.2		31.7	
Scenarios: 100 EUR more for each household with …				
• S1: Low income (deciles 1 and 2)	28.5	*-0.7*	30.8	*-0.9*
• S2: Medium income (deciles 5 and 6)	29.0	*-0.2*	31.4	*-0.3*
• S3: High income (deciles 9 and 10)	29.6	*0.4*	32.0	*0.3*

Note: The table reveals the sensitivity of the Gini index to changes in household income. More concretely, it shows how the Gini index of disposable income would change in France and Italy if the monthly equivalised disposable household income of the low-, medium- or high-income households would increase by 100 EUR, corresponding to a fiscal impulse of around 2.5% of GDP for France and 3% for Italy for each scenario considered. Status-quo refers to the year 2013 using EU-SILC data from 2012 uprated to 2013 with inflators specific to income components. The definition of disposable household income used here differs slightly from the EU-SILC definition, which results in slightly different Gini indices compared with EU-SILC and EUROMOD.
Source: Author's calculations based on EU-SILC data and EUROMOD simulations.

Finally, the evolution of median household income is used as a complementary indicator. Inequality is a *"relative"* concept comparing the income of a household (or an income decile) to the entire income distribution of a country (or a specific income share). This leaves aside that the low-, middle- and high-income households may all be better off in *"absolute"* terms even if they maintained their respective places within the income distribution. Therefore, the development of the median household income is used as an additional indicator to find out if the change in inequality occurred in the context of an increase of median income.

Indicators of redistribution

A key indicator for the size of redistribution through the overall tax and benefit system is the difference between the Gini index of market and disposable income. This difference indicates the redistributive power of the tax and benefit system of each country: the higher it is, the higher the direct redistributive impact of the tax and benefit system.

In addition, Gini elasticities are used to examine the relative importance of single tax and benefit components to changes in income inequality. The elasticities measure the impact of a marginal increase in a tax or benefit component on inequality of disposable income, holding income from other sources constant. The Gini elasticity depends on three factors, namely (i) the share of the tax/transfer item in total income, (ii) how equally or unequally they are distributed and (iii) their correlation with the distribution of total income (see Annex III.2 for more information). ([6])

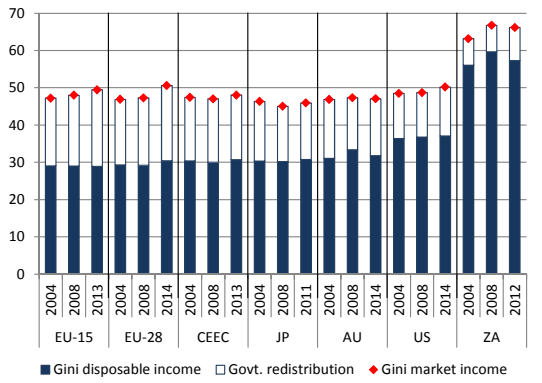
([6]) See for more details López-Feldman (2006).

higher than in other major advanced and developing economies (see white bars in Graph III.3.2). In the EU-28, inequality of market income has increased since 2004 to a level which is now at the similar level as the US (see red diamonds in Graph III.3.2). Inequality of disposable income has, however, remained relatively low compared to other major and developing economies. This means that the redistributive effects of the tax and benefit system mitigated the effects of the rise in market inequality. Indeed, the EU-28 has the highest government redistribution across the regions considered (almost twice as large as in the US).

Median income has grown faster than prices in the EU since 2005 (Table III.3.1). A focus on the Gini indices ignores that the rich, middle-class and poor might all be better off in "absolute" terms even in an environment of higher inequality. Since

2005, the median income of households increased faster than HICP inflation. This is particularly the case between 2005 and 2010, but also for the period 2010 to 2014.

Graph III.3.2: **Income inequality and government redistribution across regions (2004, 2008 and 2014)**



Note: The graph shows the evolution of income inequality and government redistribution across selected regions between 2004 and 2014. Inequality is measured as the Gini index of market and disposable income (in per cent). Government redistribution is calculated as the difference between the Gini indices of market and disposable income. Regions are shown in inequality-increasing order based on the Gini index of disposable income of the latest available year of observation. The following countries or regions are included: 15 EU Member States before Eastern enlargement in 2004 (EU-15), current 28 EU Member States (EU-28), 10 EU Member States from Eastern and Central Europe (CEEC), Japan (JP), Australia (AU), United States (US) and South Africa (ZA). Gini indices for EU-15, EU-28 and CEEC are based on simple unweighted averages. If data for 2014 are not available, the latest available year is taken. Reading example: In 2004, the Gini index of market (disposable) income for the EU-15 average was 47.2% (29.1%). The difference can be attributed to government redistribution through the tax and benefit system.
Source: Author's calculations based on Solt (2016), SWIID version 6.0.

Member States exhibit sizeable differences in inequality of market income (see red diamonds in Graph III.3.3). The three least unequal countries based on the average Gini market index over the period 2004-2014 were Cyprus, the Netherlands and Denmark (which all had Gini coefficients of less than 43%). Ireland, the United Kingdom and Portugal, by contrast, were the most unequal countries (with Gini coefficients of market income above 52%).

Significant differences between Member States also exist in terms of the inequality of disposable income, but with a different ranking than based on market income (see blue bars in Graph III.3.3). A comparison of the Gini indices of disposable income shows that Slovenia, Sweden and the Czech Republic are the most equal countries in the EU (Gini indices below 26%). By contrast, Latvia, Portugal and Bulgaria are the most unequal countries (Gini coefficients exceeding 35%).

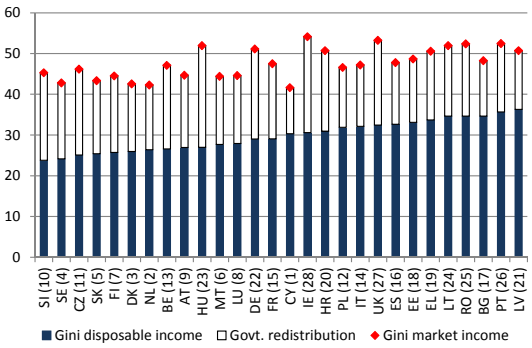
Table III.3.1: **Evolution of median income and prices since 2005 (median income = HICP inflation = 100 in 2005)**

	Initial level	Median income (S50)		HICP	
	2005	2010	2014	2010	2014
EU-28	100	121	128	113	118
EU-15	100	117	122	111	116
CEEC	100	176	200	123	130
Nordic	100	117	139	112	116

Note: The table compares the evolution of the median income (S50) of households with the HICP inflation rates across selected EU country groups since 2005.
Source: Author's calculations based on EU-SILC.

The tax and benefit systems reduced inequality in the EU on average by around one-third (see white bars in Graph III.3.3). A telling summary indicator for the magnitude of governments' redistribution is the difference between the Gini indices of market and disposable income. While the tax and benefit systems reduced inequality in the EU on average by around one-third, the size of redistribution is heterogeneous across Member States, ranging from 27% in Cyprus to 48% in Hungary (Graph III.3.3).

Graph III.3.3: **Income inequality and government redistribution across EU Member States (average 2004-2014)**

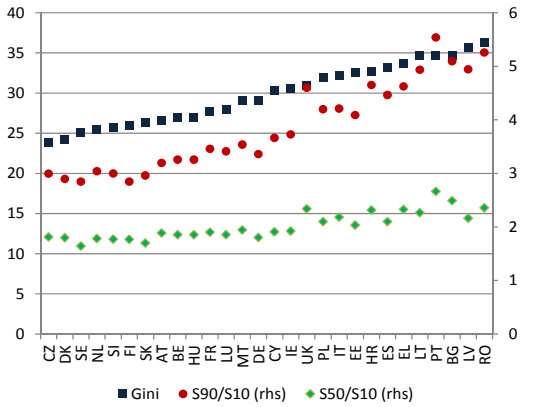


Note: The graph shows the average Gini indices of market and disposable incomes (in per cent) and government redistribution across Member States between 2004 and 2014. Government redistribution is calculated as the difference between Gini market and disposable income. Countries are ranked according to the Gini index of disposable income in inequality-increasing order; the ranking based on the Gini index of market income is shown in brackets.
Source: Author's calculations based on EU-SILC.

The ranking of EU Member States from most to least unequal is quite robust irrespective of the income inequality indicator used (Graph III.3.4). Apart from the Gini index, we also consider two indicators comparing the upper-bound value of the equivalised household disposable income of the ninth decile to that of the median income

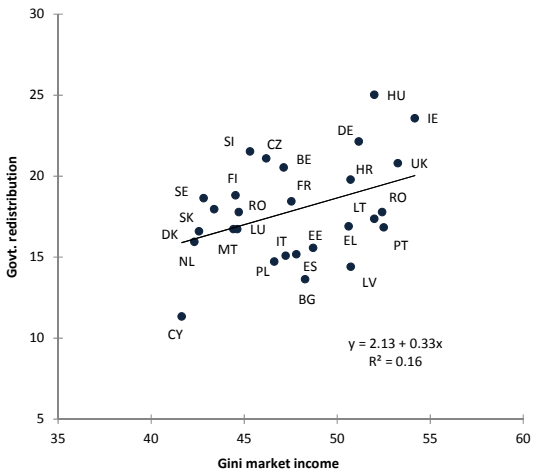
(S90/S50) and the median income to the upper-bound value of the first decile (S50/S10). Overall, the correlation between the three indicators is very high.

Graph III.3.4: **Gini index and income share ratios (based on disposable income, average 2004-2014)**



Note: The graph shows three indicators of inequality (Gini index, income share ratios S90/S10 and S50/S10) of 28 Member States for the average period 2004 to 2014. Countries are ranked according to the Gini index in ascending order. Overall, the correlation between the three series is very high, as indicated by the pairwise correlation coefficients (pcc) of Gini and S90/S10 (pcc = 0.96), Gini and S50/S10 (pcc = 0.86) and S90/S10 and S50/S10 (pcc = 0.96).
Source: Author's calculations based on EU-SILC.

Graph III.3.5: Relationship between market inequality and government redistribution (average 2004-2014)



Note: The graph shows that there is a weak positive relationship between the Gini index of market income and the government redistribution. Government redistribution is measured as the difference between the Gini index of market and disposable income. Government redistribution and the Gini index of market income are measured as country averages over the period 2004 to 2014.
Source: Author's calculations based on EU-SILC.

More unequal Member States tend to redistribute somewhat more (Graph III.3.5). The positive correlation between market inequality and the size of government redistribution indicates that Member States with higher market inequality tend to redistribute more. The relationship is, however, weak as shown by a rather large variation of government redistribution for a given level of market inequality.

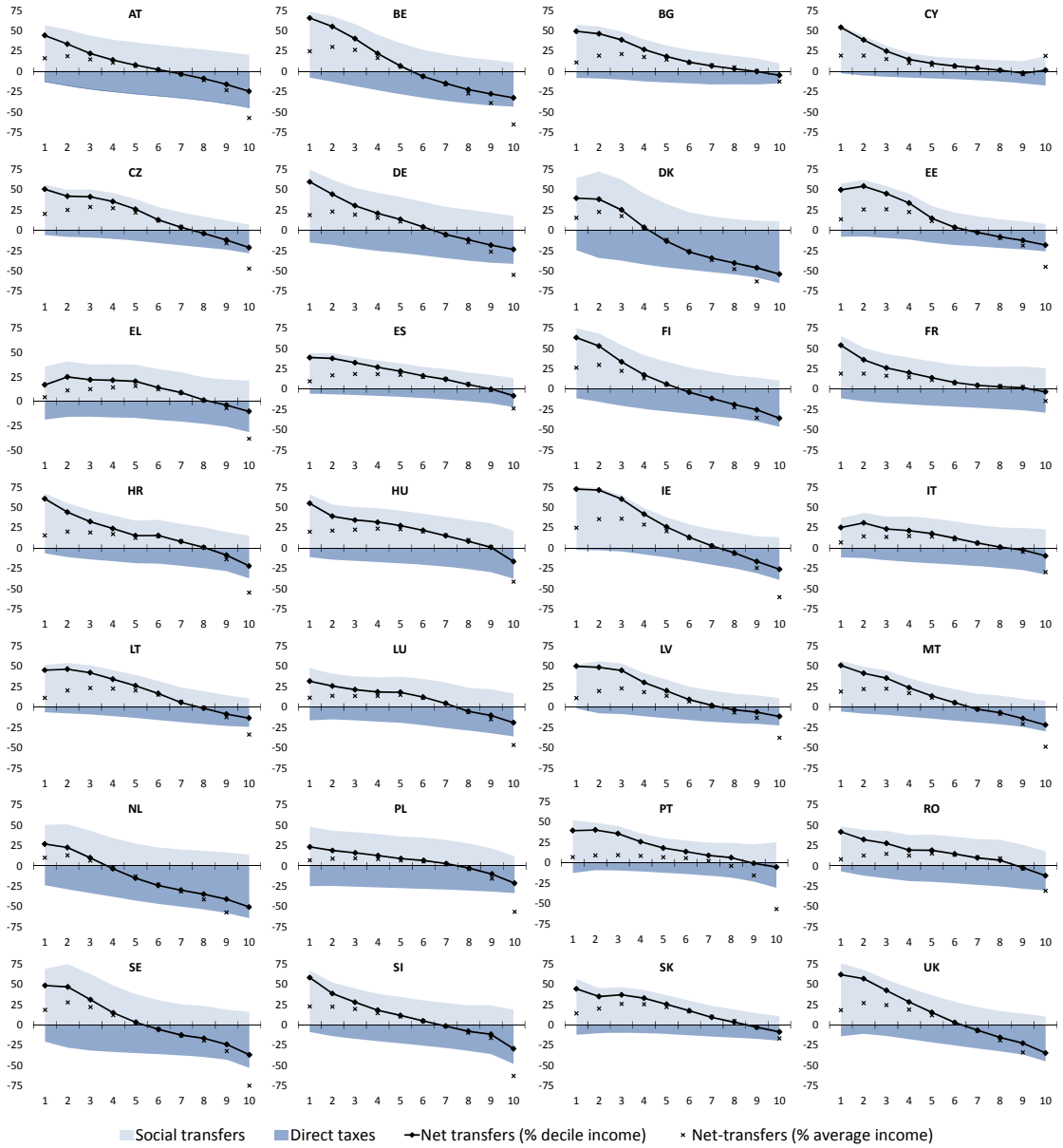
Government redistribution through the tax and benefit system tends to run from the high- to the low- and middle-income households (Graph III.3.6). A telling summary indicator for the direction of redistribution through the entire tax and benefit system is the net transfers, which are defined as the sum of social transfers net of direct taxes per disposable income of a given income decile. Overall, there is redistribution through the tax and benefit system from high- to low- and middle-income households, since net transfers tend to be positive for low- and middle-income and negative for high-income households (see black line with diamonds in Graph III.3.6). In some Member States households in almost all income deciles exhibit positive net transfers (i.e. they are net receivers), which can be explained by the sizeable impact from pensions.

The lower-middle class appears to receive the largest support from the tax and benefit system. Comparing the net transfers across deciles in per cent of GDP (as opposed to in per cent of disposable income per decile as in the previous paragraph) shows that the second, third and fourth income deciles receive the largest net transfers (see black crosses in Graph III.3.6).

The direction of government redistribution is affected by two factors, namely:

- ***The design of social transfers***: Social transfers have a redistributive impact since poorer households tend to receive more social transfers relative to their income than richer ones (see light blue area declining over decile in Graph III.3.6). In most Member States, social transfers are largely targeted at the bottom deciles. The bottom decile gains the most from social transfers in the United Kingdom and Ireland and the least in Italy and Spain. In some Member States (e.g. AT, FR, HU), sizeable transfers are also paid to high-income households, which can be explained by a sizeable impact from pensions.

Graph III.3.6: **Main receivers from and contributors to government redistribution by decile (average 2004-2014)**



Note: This graph shows the net receivers from (+) and net contributor to (-) the tax and benefit system by income deciles for 28 Member States. The black line shows net transfers, which are defined as average social transfers minus direct taxes and social security contribution by the employee in per cent of disposable household income for a given decile. The black crosses show net transfers in per cent of GDP. Positive (negative) net transfers imply that the average household of a given decile is a net receiver from (net contributor to) the tax and benefit system. Taxes are computed as the sum of taxes on income, social insurance contributions from the employee and taxes on wealth. Social transfers are calculated as a difference between total disposable household income and total disposable household income before social transfers including old-age and survivor's benefits. Outliers (households for which net transfers larger than +/-150% of disposable income) were removed due to distortions in the results for the first and last deciles.
Reading example: In Austria, the households in the six lowest income deciles are on average net receivers from the tax and benefit system, i.e. their social benefits received are larger than their direct taxes and social security contributions paid. The households in the four upper deciles are net contributors, implying that tax payments outweigh social benefits received. The second income decile receives the highest net transfers in per cent of GDP.
Source: Author's calculations based on EUROMOD.

- ***The design of direct taxes***: Direct taxes have a redistributive impact due to their progressive design, i.e. richer households tend to pay more relative to their income than poorer ones (see dark blue areas increasing the tax burden over decile in Graph III.3.6). The most important instrument of the tax and benefit system affecting incomes is direct income taxation, which is particularly high in Denmark and the Netherlands.

The largest share of inequality reduction comes in the EU on average from social transfers in cash (around 80%), while the remaining part (less than 20%) can be attributed to direct taxes (Graph III.A2.1 in Annex 2). ([98]) A key component of the inequality-mitigating impact comes from pensions. Excluding pensions from the calculation reduces the impact from social transfers to around 62% and increases the role of direct taxes to around 28%.

To identify the inequality-mitigating impact of each sub-component of the tax and benefit system, so-called Gini elasticities are calculated (Graph III.3.7 and for country-specific results Table III.A2.2 in Annex III.2). Gini elasticities measure the impact of a one-per cent increase of the sub-component on the reduction of inequality keeping all other sub-components unchanged.

- ***Direct taxes represent the most powerful tool in reducing inequality.*** Direct taxes tend to be redistributive due to their progressive nature, i.e. the tax burden increases with increasing disposable income. All things being equal, a one-per cent increase in direct taxes reduces income inequality by around 0.15%. The impact tends to be somewhat higher for Nordic countries (0.2%) and CEECs (0.16%).

- ***Pensions play the most prominent role among social transfers.*** On average a one-per cent increase of pensions reduces inequality by around 0.11%. Pensions tend to play a more important role in the Nordic countries (0.16%) and the EU-15 (0.15%) than in the CEEC (0.09%). ([99])

- ***Education and family/children allowances have a relatively small impact on reducing inequality***. A one-per cent increase of these allowances appears to reduce inequality by around 0.05% in the EU-28, with a somewhat higher average impact in the Nordic countries (0.08%) and CEECs (0.06%).

- ***Survivor, sickness and disability benefits tend to have a relatively small effect on inequality***. A one-per cent increase of these items reduces inequality by around 0.04% in the EU-28 on average. The Gini elasticities are slightly higher for the EU-15 (0.05%) and Nordic countries (0.05%).

- ***Unemployment benefits have a relatively small effect on inequality.*** A one-per cent increase reduces inequality by around 0.02% in the EU-28 on average. The Gini elasticity is significantly higher in the Nordic countries (0.07%). ([100])

- ***Social exclusion and housing allowances appear to have the smallest impact in mitigating inequality among the items considered***. A one-per cent increase reduces inequality by around 0.02% (EU-28) and up to 0.03% (Nordic countries).

The Gini elasticities can be decomposed in three components (Table III.3.2; for background information on the calculation of the Gini elasticities see Annex III.2): ([101])

- ***First, the size of the tax or benefit item with respect to total income (S).*** The sub-component *S* measures the share of the tax or benefit item with respect to total income, therefore potentially ranging from 0 (the tax or benefit item is zero) to 1 (the tax or benefit item represents 100% of household's income). ([102]) If the share of income covered by the tax or benefit item is large, that item can

([98]) This paragraph refers to averages for the period ranging from 2004 to 2014.

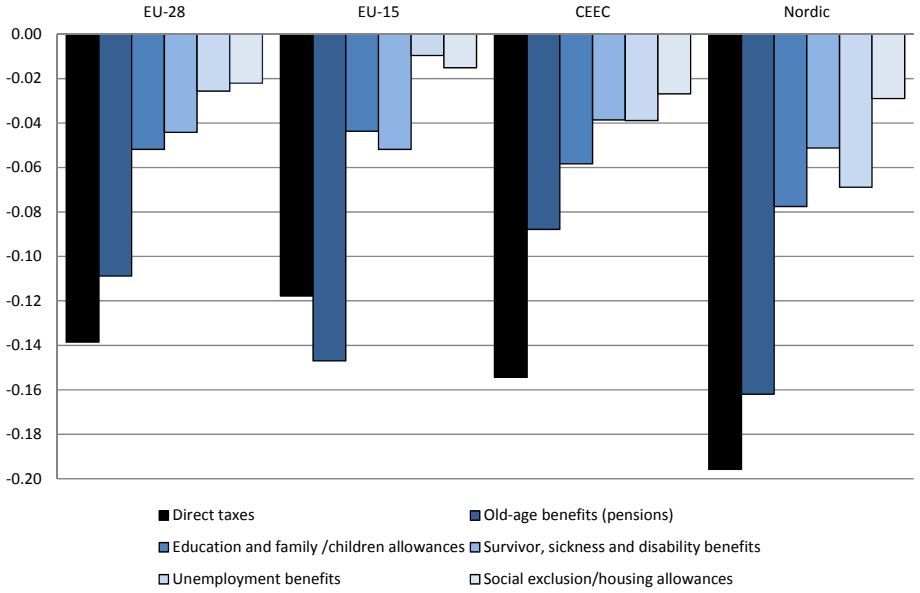
([99]) The role of pensions should, however, be interpreted with caution, since a sizeable part of the pension payments has not a purely redistributive motive, but is linked to the pension contribution payed over the working life (insurance motive).

([100]) Note that the key objective of unemployment benefits is not necessarily to reduce inequality, but to insure against job loss.

([101]) In the following the findings of the decomposition are shown for the EU average (for country-specific results see Annex III.2 Table III.A2.2).

([102]) To allow for an easy comparison across the tax and benefit items, total income is expressed here as the sum of total transfers received plus direct taxes paid, i.e. direct taxes are considered with a positive entry on income. Market income is excluded, since the focus of this part lies on government redistribution.

Graph III.3.7: **Impact of sub-components of the tax and benefit system on income inequality (Gini elasticities in per cent, average 2004–2014)**



Note: The graph shows the effect of key sub-components of the tax and benefit system on the Gini index over the period 2004 to 2014 using so-called Gini elasticities (for a description see Box III.3.1). Country averages are calculated based on unweighted country averages. The elasticities measure the impact of a marginal increase in the tax or benefit item on inequality of disposable income, holding income from other sources constant. Direct taxes include social security contributions from the employees. Data on taxes and social security contributions are missing for the following EU-SILC samples: EL (2004, 2005, 2006), ES (2004, 2005), IT (2004, 2005, 2006), LV (2005, 2006), PT (2004, 2005, 2006). Reading example: A one-per cent increase of direct taxes reduces the Gini index for the EU-28 average by around 0.14% over the period 2004 to 2014.
Source: Author's calculations using EU-SILC.

potentially (but not necessarily) have a large impact on inequality. In the EU-28 on average direct taxes (46%) followed by pensions (34%) represent the most important income sources of the tax and benefit system (Table III.3.2).

Table III.3.2: **Decomposition of Gini elasticities (EU-28, average 2004-2014)**

Source	Gini elasticity	Contributions		
		S	G	R
Direct taxes	-0.14	0.46	0.55	-0.81
Pensions	-0.12	0.34	0.79	0.14
Education, family, children	-0.05	0.07	0.74	-0.12
Survivor, sickness and disability	-0.04	0.08	0.89	-0.01
Unemployment benefits	-0.02	0.04	0.94	-0.04
Social exclusion, housing	-0.02	0.01	0.95	-0.45

Note: This table shows the decomposition of the Gini elasticity in three components S, G and R based on unweighted averages of 28 EU Member States (see Annex III.2 for further information). Since the focus is here on government redistribution, the market income is not considered here as and income source. Total income (S) is expressed here as a share of total transfers plus the absolute value of taxes, excluding market income.
Source: Author's calculations based on EU-SILC.

Significantly less is spent for survivor, sickness and disability benefits (8%), education, family and children allowances (7%), unemployment benefits (4%) and social exclusion and housing benefits (1%).

- ***Second, the distribution of the tax or benefit item across households (G)***. The sub-component *G* measures the distribution of the specific tax or benefit item across households in the form of the Gini index assuming that the specific tax or benefit item is the sole income source. G ranges from 0 (perfect equality, i.e. the benefit received/tax paid is the same for every household) to 1 (maximal inequality, i.e. the benefit received/tax paid is concentrated on only one household). A benefit item, which is totally equally distributed across individuals (G=0), does not redistribute cash across individuals and thus does not influence inequality, irrespective of its magnitude. The findings show that benefits linked to social exclusion and housing, unemployment benefits, but also survivor, sickness and disability benefits are the most unequally distributed. Pensions and education, family/children allowances are less unequally distributed. The least unequally distributed item is direct taxes.

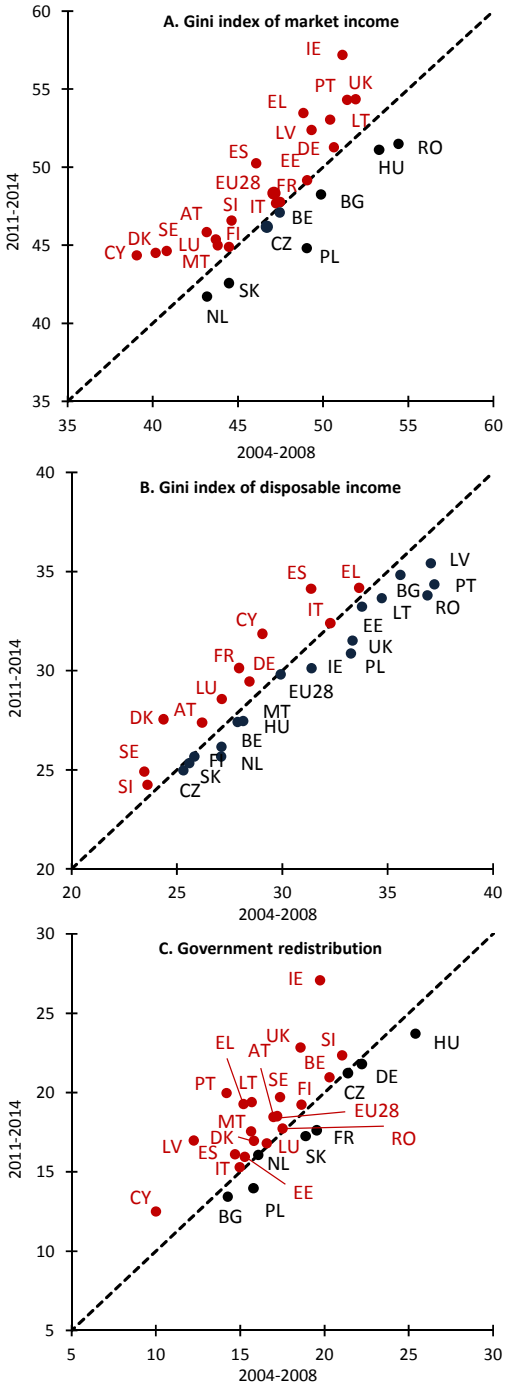
- ***Third, the direction of the tax or benefit item on inequality (R).*** The sub-component *R* shows whether the benefit or tax decreases inequality by targeting the top of the income distribution (R is positive and large) or decreases inequality by targeting the low-income households (R is negative or close to 0). Our findings show that the tax and benefit items considered all tend to reduce income inequality, but with a different degree. Direct taxes and benefits linked to social exclusions and housing seem to have the most important impact, i.e. are those items redistribute most towards the low-income households.

In brief, the redistributive impact of the tax or benefit item depends not only on the size, but also on how much it is targeted to the different income deciles. Pensions have a large elasticity due to the fact that total pension payments are pretty large, but they tend to reach also the medium- and high-income households. On the other hand, benefits for education, family and children are much smaller, but they tend to be targeted to the poor.

3.1.2. Trends since the Great Recession ([103])

Market income inequality has increased in 19 and declined in 8 Member States since the Great Recession (see first panel of Graph III.3.8). The Gini index of market income increased significantly (by at least 4 percentage points) in the post- compared with the pre-Great Recession period in Ireland, Cyprus, Greece, Denmark and Spain. By contrast, most Central Eastern European countries, but also the Netherlands exhibited a reduction in the Gini indices of market income. For the remaining EU Member States, the Gini remained relatively stable between the pre- and post-crisis period.

Graph III.3.8: **Inequality of market and disposable income before and after the Great Recession**



Note: This graph compares the Gini index of market income (left panel) and disposable income (right side) before (average 2004-2008) and after (2011-2014) the Great Recession. Countries above (below) the 45 degrees' line experienced an increase (a decrease) in the Gini coefficient compared to the level before the Great Recession and they are highlighted in red (black).
Source: Author's calculations based on EU-SILC.

([103]) We follow the literature in describing the global economic and financial crisis, which originated in the US housing sector at the end of 2007, as the "Great Recession" (e.g. Mian and Sufi, 2010). To assess how inequality evolved in the aftermath of the Great Recession, we compare the average Gini index of market and disposable income in the period before (average 2004-08) and after (average 2011-14) the Great Recession. Croatia is missing in this section due to lack of data for the period before the Great Recession.

Disposable income inequality has increased in only 11 and declined in 16 Member States since the Great Recession (see second panel of Graph III.3.8). The 16 Member States showing a reduction of inequality include a diverse mix, such as those Member States with lower market inequality (see paragraph above), but also the United Kingdom, Ireland, Finland, Portugal and Latvia.

Government redistribution increased in 19 and declined in only 8 Member States following the Great Recession (Graph III.3.8, III.3.9). Redistribution increased not only in Member States heavily hit by the crisis (IE, PT, EL, CY, ES, SI, IT), but also in several Nordic (UK, DK, FI) and in the Baltic (LV, LT, EE) countries. In several Member States, the additional redistribution more than offset the increase in market inequality, leading to lower inequality in disposable income (e.g. IE, PT, LV, UK, LT, MT, EE) (Graph III.3.9). In other Member States (such as EL, CY, SE, AT, ES, SI, DK, LU) the redistribution has only partially offset the increase in market inequality, resulting in a rise in disposable inequality (Graph III.3.9). France and Germany witnessed over the period both a rising market inequality and a decreasing redistribution through the tax and benefit system, amplifying disposable income inequality.

The high-income households bear a significant part of the adjustment burden following the Great Recession (Graph III.3.10). In 14 Member States net transfers, i.e. social transfers net of direct taxes, of high-income households declined following the Great Recession (in particular in EL, ES, IT, LV, PT). ([104]) This reflected in particular higher taxes and social security contributions for the high-income households. The low- and frequently also the median-income households, in contrast, appear to have benefitted more from government redistribution through an increase in net transfers. The increase mainly results from higher unemployment benefits, while increases in taxes affected them to a lesser extent than high-income households due to their smaller share of tax payments in disposable income. ([105]) This mitigated the adjustment burden of the low- and middle-income households, especially in Member States severely hit by the crisis. ([106])

It is difficult to disentangle the redistributive effects of policy measures from changes in the economic and demographic conditions. De Agostini et al. (2016) try to isolate the impact of policy measures (e.g. changes in the tax or benefit system) from changes in the population structure, i.e. the economic and demographic situation (e.g. more/less persons eligible for unemployment benefits or more retired persons) using EUROMOD simulations during the period 2008–14. ([107]) The authors distinguish between three sets of countries: (i) countries with both implemented policy measures (more progressive policies) and changes in the population structure ([108]), notably in some crisis-hit Member States (EL, CY, ES, IT, SI, PT); (ii) countries which mostly focused on policy measures (notably AT, DK, LU, SE) and (iii) Member States which showed mainly changes in the population structure (e.g. IE, UK and some catching-up Member States). In addition, they find that most Member States implemented policy measures which increased progressivity in the first phase of the crisis (2008-11), whereas they focused more on regressive policy measures in the second phase of the crisis (2011-14).

([104]) The sharp decrease in net transfers for the top decile ranges from 20pps in Spain and Latvia to at least 40pps in Greece, Portugal and Italy.

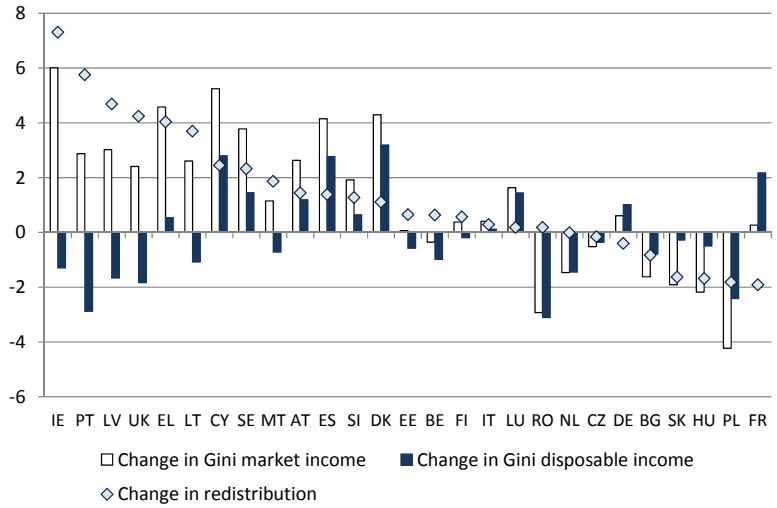
([105]) Further analysis is needed to find out if the increase in unemployment benefit expenditure is due to changes in the generosity of unemployment benefits (policy change), or due to an increase in overall unemployment benefit expenditure (automatic stabilisation, no policy change).

([106]) For instance, the share of net transfers in disposable income drops by around 8pps in Spain, Italy and Latvia, by 14pps in Portugal and 21pps in Greece.

([107]) Different alternative indicators have been used to uprate income components and build a counterfactual of what would have occurred in case of no policy changes (notably market-income index (MII) and consumer price index (CPI)). The findings reported here refer to the use of the MII, but they do not change qualitatively when considering the CPI instead (see De Agostini, et al., 2016). For a similar exercise see Bargain et al. (2017), for an overview article see Figari et al. (2015).

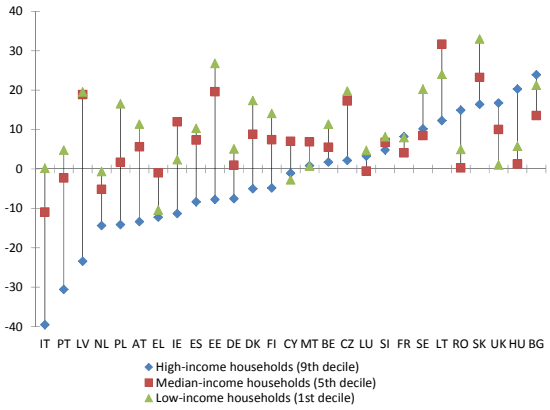
([108]) The change in population structure indicates the combined effect of demographic changes (e.g. more or fewer retired persons, or more or fewer new-borns) and changes induced by the economic situation (e.g. more or fewer unemployed).

Graph III.3.9: **Changes in income inequality and redistribution since the Great Recession**



Note: This graph depicts the change of income inequality (of disposable and market income, in per cent) and redistribution through the tax and benefit systems in the period before (average 2004-08) and after (average 2011-14) the Great Recession. Positive (negative) values indicate that inequality/ redistribution increased (decreased) in the post-crisis compared with the pre-crisis period.
Source: Author's calculations based on EU-SILC.

Graph III.3.10: **Changes in net transfers following the Great Recession (in per cent)**



Note: This graph depicts the change in net transfers (i.e. social transfers net of taxes) associated with the redistribution through the tax and benefit systems in the period after (average 2011-14) compared to before (average 2004-08) the Great Recession. The changes are normalised by the median disposable income before (average 2004-08) the Great Recession. Positive (negative) values suggest that the associated income deciles experienced lower (higher) net transfers in the post-crisis compared with the pre-crisis period, implying an increased (reduced) contribution to the welfare system. There should be caution in interpreting the graph, in particular since (i) a given income decile may not consist of the same households before and after the Great Recession, and (ii) the analysis is restricted to three income deciles only.
Reading example: In Italy, the difference between the market and disposable income (i.e. the net transfers) for the high-income households decreased in the period after the Great Recession by almost 40% of the disposable income of the high-income households before the crisis.
Source: Author's calculations based on EU-SILC.

3.2. TOTAL EFFECTS OF FISCAL POLICY ON INEQUALITY: A REGRESSION ANALYSIS

This section analyses the role of fiscal policy on disposable income inequality using a panel regression model, complementing the previous analysis mainly by two dimensions:

- **First, the regression approach allows analysing the *total*, i.e. direct and indirect, effects of fiscal policy on income inequality**. Section III.3.1. focuses on the direct effects of the tax and benefit systems on income inequality. It does, however, not capture the potential indirect effects resulting from changes in the behavioural responses or macroeconomic feedback effects. ([109]) The regression framework tries to identify the impact from fiscal policy instruments by controlling for

([109]) For instance, an increase in unemployment benefits has a direct inequality-mitigating effect by giving cash to households with otherwise zero earnings. At the same time, the literature suggests that unemployment benefits can weaken work incentives, increase unemployment and lower growth, which, in turn, can potentially increase inequality (indirect effect) (Conesa and Krueger 2006). Similarly, higher taxes for high-income households have a direct inequality-reducing effect. However, insights from the literature suggest that tax hikes can be harmful for growth and therefore potentially increase inequality (indirect effect) (Heathcote et al., 2017).

other potential determinants of inequality (such as unemployment, budget constraints), therefore analysing the total effects.

- Second, the panel framework makes it possible to assess the impact of fiscal policy on income inequality over a longer time horizon. The analysis in the previous section is based on household data, which is only available for the years 2004 to 2014. Using a panel framework enables us to extend the time horizon to the period from 1980 to 2014. This is meaningful, since income inequality tends to be particularly influenced by medium- to long-term factors (Förster and Tóth, 2015). For instance, the effect from technological changes typically only slowly materialises and therefore affects the income distribution over the medium term.

3.2.1. Estimation strategy

The key objective of the regression approach is to explain variations of the Gini index of disposable income. That variable is therefore used as the dependant variable in the regression design. The income inequality data come from the Standardized World Income Inequality Database (SWIID), which provides comparable data on income inequality for a large country sample derived from surveys available for cross-national research. ([110]) Unlike other inequality databases, it includes Gini inequality indices for income inequality before and after taxes and benefits.

The key (independent) variables we want to test are fiscal policy indicators, which measure public spending by function of government. We rely on the OECD Public Finance Dataset, which provides comprehensive, cross-country comparable data on government spending and revenues. ([111]) The breakdown of expenditure items is based on the national accounts classification of the functions of government (COFOG). That definition of fiscal elements is therefore broader than the split used in Section III.3.1, which focuses exclusively on elements of the tax and benefit system. The dataset includes eleven expenditure categories, namely: education, health, other wages and intermediate consumption, old-age and survivor pensions, sickness and disability, unemployment benefits, family and children, subsidies, investment, other primary expenditure, property income paid (incl. interest payments). The same dataset also includes indicators for revenue items, such as revenues from personal income tax.

To isolate the impact from the fiscal policy indicators from other potential channels influencing inequality, we control for a wide range of variables in line with the literature, i.e.: ([112])

- *Inequality*: lagged Gini index of disposable income to control for the persistency in inequality; contemporaneous Gini index of market income to rule out the channel of market inequality;
- *Macroeconomic conditions*: ([113]) real GDP per capita, real GDP growth rate;
- *Budget constraint*: ([114]) primary balance of the general government;
- *Labour market conditions*: ([115]) unemployment rate, share of part-time workers, flexibility of labour market institutions;
- *Demographic factors*: persons above 65 years in per cent of total population;
- *Educational attainment*: ([116]) number of school years;
- *Globalisation and trade*: ([117]) export and imports;
- *Technological changes*: ([118]) value added of high-and medium technology sectors;
- *Political process*: ([119]) partisanship, election year.

The drivers of income inequality are investigated with a dynamic panel data approach. The analysis focuses on up to 28 Member States (*i*) and 8 periods of five-year

([110]) Solt (2016).
([111]) Bloch et al. (2016).
([112]) For a comprehensive summary of the main drivers of inequality see Förster and Tóth (2015).
([113]) Traditional papers are Kuznets (1955) and Barro (2000).
([114]) See Agnello and Sousa (2014) and Ball et al. (2013).
([115]) Checchi and Garcia-Penalosa (2008).
([116]) De Gregorio and Lee (2002); Sylwester (2002).
([117]) Roine et al. (2009); Grossman and Helpman (2016); Dreher (2006).
([118]) Chusseau et al. (2008).
([119]) Alesina and Perotti (1996); Alesina and Rodrik (1994); Mohl and Pamp (2009).

averages between 1980 and 2014 (t) using the following dynamic panel specification: ([120])

$$\ln Gini\ DI_{i,t} = \beta_1 \ln Gini\ DI_{i,t-1} + \beta_2 \ln Gini\ MI_{i,t} + \beta_3 \ln X_{i,t-1} + \beta_4 \ln fiscal\ variables_{i,t-1} + \gamma_t + \theta_i + u_{i,t}$$

where the Gini index of disposable income (*Gini DI*) is regressed on the lagged Gini index of disposable income to take into account the persistence of inequality. We control for the contemporaneous Gini of market income (*Gini MI*) to isolate the impact from disposable income. We do not, however, control for the lagged Gini of market income, since our regression results aim at capturing the indirect effects, which tend to affect market and disposable income over the medium-term (see Chapter III.1, Graph III.1.1). The specification also includes a set of control variables in line with the literature review, which are summarised in vector *X*. The key focus of the analyses lies on the disaggregated fiscal variables, which measure fiscal policy by function of government and are expressed in per cent of GDP. The dynamic panel specification set-up allows assessing short- (ST and long-term (LT) effects of the fiscal variables on income inequality, i.e. $\frac{\partial \ln Gini\ DI}{\partial \ln fiscal\ var.}\Big|^{ST} = \beta_4$; $\frac{\partial \ln Gini\ DI}{\partial \ln fiscal\ var.}\Big|^{LT} = \frac{\beta_4}{(1-\beta_1)}$. We also control for time- (γ) and country-fixed effects (θ) and include an error term (u) ([121]). To simplify the interpretation of the estimated coefficients all variables are logged ([122]). We use 5-year averages to control for business cycle effects and to put an emphasis on longer-term drivers. ([123])

3.2.2. Main results

At first sight, there is an inverse relationship between several fiscal expenditure sub-components and income inequality (Graph III.3.11). That inverse correlation means that an increase in the fiscal expenditure item is associated with a decline in income inequality. The relationship seems to be relatively strong for family and children allowances, expenditure of sickness and disability (with R-squared coefficients of around 0.4) and weaker for health expenditure and unemployment benefits (with R-squared coefficients of around 0.2). There is no clear relationship between inequality and investment and pension spending.

The empirical analysis points to a significant impact of several control variables on inequality. ([124]) The results of the baseline specifications point to a rather strong persistence of income inequality as shown by the significant lagged dependent variable (Table III.3.3). ([125]) The contemporaneous market inequality appears to have a positive and significant impact on inequality. In addition, an increase in real GDP per capita and improvements in the educational attainment tend to reduce inequality. Finally, improving the fiscal situation also tends to reduce inequality, although it is not significant in all specifications used. No clear-cut results can be found regarding the impact of unemployment, ageing or technological change as well as for the role of political-economy factors on income inequality.

Some fiscal expenditure variables have had an inequality-mitigating total effect. In particular, an increase in sickness and disability as well as in family and children expenditure seem to be effective measures in reducing income inequality in the EU-28 on average over the period 1980 to 2014 (Table III.3.4). An increase in sickness and disability benefits by 10% decreases the Gini index of disposable income by around 0.4% in the short-run and by slightly above 1% in the long-term effects. The findings are robust to changes of the variables included in the baseline (see robustness checks shown in Table III.A2.5).

([120]) For a similar specification see: Barro (2000); Berg and Nilsson (2010) and Woo et al. (2013).

([121]) The summary statistics (Table III.A2.3) and correlation matrix (Table III.A2.4) of the variables used can be found in Annex III.2.

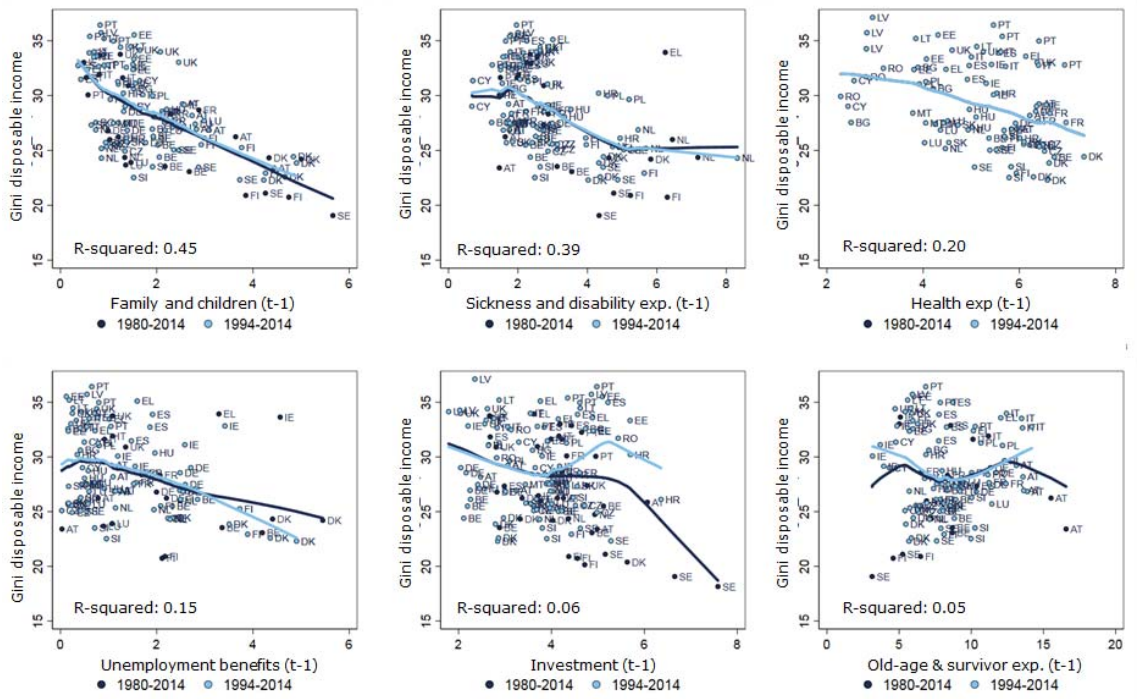
([122]) For variables which can be negative or zero, the value is transformed by adding 10 before taking the log.

([123]) For a similar specification see: Barro (2000); Berg and Nilsson (2010) and Woo et al. (2013).

([124]) The regression strategy is conducted in two steps. In a first step, the baseline specification is derived using the main independent variables identified in the literature. In a second step, the baseline regression is augmented by adding the disaggregated fiscal variables by function of government. In terms of the estimators, we start with a simple fixed effects specification, but also use GMM estimators to control for a potential endogeneity bias.

([125]) More independent variables have been tested, but are not shown since they turned out to be not significant. These include, inter alia, indicators for the labour and product market legislation (measured with OECD indicators), effective corporate tax rate, personal income tax.

Graph III.3.11: **Relationship between inequality and disaggregated fiscal policy items (EU, 1980-2014)**



Note: The graph shows simple correlations between the income inequality measured as the Gini index of disposable income (y-axes) and the main fiscal expenditure items by function of government in per cent of GDP (x-axes) using 5-year averages. The sample covers 28 Member States, which are highlighted in light blue (period since 1995) and dark blue (1980 until 1995). The fit is illustrated using a locally weighted scatterplot (non-parametric regression), which has the main advantage of not requiring to specify a global functional form to fit a model. The fit is calculated for two periods, namely 1980-2014 (dark blue line) and 1995-2014 (light blue line).
Source: Author's calculations.

In addition, expenditure on education and health appear significant in almost all specifications. Education expenditure is found to have the biggest impact across the fiscal sub-elements considered. An increase of education spending by 10% can decrease the Gini index of disposable income by more than 1% in the short-run and close to 2% in the long-run. The impact from a rise in health expenditure is expected to be somewhat smaller. The remaining fiscal expenditure items turn out to be not statistically significant. In terms of the robustness of the results, adding those fiscal sub-elements to the baseline specification does not alter substantially the findings for the key control variables reported in the previous paragraph.

Overall, the findings of the regression analysis show that indirect effects can weaken the impact of fiscal policy on inequality. As explained above, a key advantage of the panel regression framework is to account for the behavioural and macroeconomic feedback effects of the fiscal expenditure items. These indirect effects can occur if the tax and benefit items weaken incentives to work or to invest in skills or if higher debt needed to finance a tax or benefit item weighs on growth. The findings reported in the regression table reveal that these indirect effects seem to (partly) offset the positive direct impact of some fiscal items on inequality. As a result, not all fiscal expenditure items are found to have a significant impact on inequality reduction for the EU-28 on average over the medium-term. This may be also explained by the fact that some fiscal sub-categories (such as pensions or unemployment benefits) may be spent more for insurance than for redistributive purposes.

Table III.3.3: **Regression results – baseline specification**

	(1) FE	(2) First-Diff GMM	(3) Sys-GMM	(4) Sys-GMM	(5) Sys-GMM	(6) Sys-GMM	(7) Sys-GMM	(8) Sys-GMM	(9) Sys-GMM	(10) Sys-GMM	(11) Sys-GMM	(12) Sys-GMM	(13) Sys-GMM
ln gini (t-1)	0.294***	0.362**	0.258**	0.325**	0.597***	0.631***	0.693***	0.673***	0.603***	0.711***	0.588***	0.666***	0.310*
	(4.999)	(2.115)	(1.981)	(2.372)	(3.486)	(5.362)	(3.885)	(5.361)	(4.327)	(4.077)	(2.639)	(4.654)	(1.734)
ln gini market income (t)	0.477***	0.038	0.187	0.120	0.292	0.376**	0.355*	0.479**	-0.045	0.337**	0.494**	0.360**	0.775***
	(4.505)	(0.126)	(0.721)	(0.477)	(0.753)	(2.334)	(1.700)	(2.096)	(-0.170)	(1.998)	(2.340)	(2.030)	(6.966)
ln real GDP pc (t-1)	-0.077	-0.044*	-0.040*	-0.040	-0.040**	-0.033***	-0.034***	-0.038***	-0.056***	-0.038**	-0.036	-0.035***	-0.070***
	(-1.045)	(-1.884)	(-1.801)	(-0.698)	(-2.080)	(-3.232)	(-2.625)	(-3.506)	(-2.791)	(-2.480)	(-0.975)	(-2.825)	(-4.293)
ln real GDP pc squared (t-1)				-0.025									
				(-0.087)									
real GDP growth (t)					-0.003								
					(-0.824)								
ln govt. headline balance (t-1)						-0.349*	-0.371**	-0.500	-0.094	-0.108	-0.234	-0.389**	-0.323
						(-1.897)	(-2.118)	(-1.261)	(-0.249)	(-1.161)	(-1.410)	(-2.315)	(-1.430)
ln unemp. rate (t-1)							0.016	0.022	0.030*	0.011	0.019*	0.011	0.003
							(1.675)	(0.971)	(1.822)	(1.339)	(1.798)	(1.513)	(1.129)
ln openness (t-1)								-0.013					
								(-0.795)					
ln part-time work (t-1)									0.031				
									(1.640)				
ln share pop > 65 (t-1)										0.021			
										(0.474)			
ln value added high-medium tech (t-1)											-0.016		
											(-0.670)		
ln govt. left (t-1)												0.024	
												(1.138)	
ln # school years (t-1)													-0.282**
													(-2.325)
# observations	153	153	153	153	153	143	143	143	112	143	76	143	143
# countries	28	28	28	28	28	28	28	28	28	28	23	28	28
Max # of obs per country	8	8	8	8	8	8	8	8	6	8	8	8	8
Min # of obs per country	3	3	3	3	3	2	2	2	2	2	2	2	2
Avg # of obs per country	5,5	5,5	5,5	5,5	5,5	5,1	5,1	5,1	4,0	5,1	3,3	5,1	5,1
AR(1) (p-value)		0,03	0,04	0,04	0.0472	0,04	0,05	0,05	0,01	0,06	0,12	0,05	0,09
AR(2) (p-value)		0,32	0,32	0,34	0.190	0,11	0,14	0,15	0,73	0,12	0,94	0,11	0,90
Hansen (p-value)		0,73	0,73	0,74	0.916	0,92	0,87	0,90	0,92	0,80	0,88	0,90	0,67
# instruments		27	27	31	28	28	29	30	31	33	30	30	30

Note: The sample includes up to 28 Member States covering the period 1980-2014 using 5-year average. Dependent variable is the Gini of disposable income. All estimations include time dummies, which are not shown due to space constraints. Estimation approaches: (1) Fixed effects using heteroskeadasticity-robust Huber-White standard errors (FE); (2) first-step difference GMM estimator (First-Diff GMM); (3) two-step system GMM (SYS-GMM) estimator following Blundell and Bond (1998), controlling for endogeneity of the lagged dependent variable and the real GDP per capita. While both estimators (2) and (3) are consistent, (3) is more asymptotically efficient. Due to the small sample size the set of internal instrumental variables is restricted to up to 4 lags and the matrix of instruments is then "collapsed". The standard errors are corrected following Windmeijer (2005). AR(1,2) and Hansen tests confirm the validity of the GMM specifications. ***, ** and * denote respectively statistical significance at 1, 5 and 10%.
Source: Author's calculations.

While the regression analysis allows for a better understanding of the total, i.e. direct and indirect, effects of fiscal policy on income inequality, some caveats remain:

- First, as for every cross-country panel approach, the results reveal relationships that are valid only on average across countries over the whole time period of investigation. This means that they may not be valid for particular sets of countries or for specific sub-periods. ([126])
- Second, while the use of 5-year averages accounts for the fact that inequality tends to be driven by medium-term changes, it comes with the cost of reducing the number of observations significantly.
- Third, income inequality is a multi-dimensional phenomenon and it remains challenging to control for the full set of potential channels without phasing a problem from multicollinearity.
- Finally, taking account for the timing of the effect of the explanatory variables is difficult. Globalisation, for instance, may well be a significant factor, but it may take some time to affect the income distribution. Furthermore, the delay may not be the same across countries and across factors.

([126]) The recent reforms in several Member States to increase incentive-compatibility of unemployment benefits, may not be fully captured, since the empirical findings only hold on average for the EU for the time period 1980 to 2014.

Table III.3.4: **Regression results – key fiscal policy components**

	(1) Sys-GMM	(2) Sys-GMM	(3) Sys-GMM	(4) Sys-GMM	(5) Sys-GMM	(6) Sys-GMM	(7) Sys-GMM	(8) Sys-GMM	(9) Sys-GMM	(10) Sys-GMM	(11) Sys-GMM	(12) Sys-GMM
ln gini disposable income (t-1)	0.325*	0.386*	0.488***	0.380**	0.385**	0.684***	0.576***	0.484**	0.648***	0.333*	0.424**	0.408*
	(1.686)	(1.847)	(3.462)	(2.394)	(2.245)	(5.066)	(3.031)	(2.301)	(2.577)	(1.910)	(2.530)	(1.789)
ln gini market income (t)	0.603***	0.701***	0.591***	0.540***	0.902***	0.543**	0.603***	0.818***	0.268	0.673***	0.770***	0.783***
	(3.698)	(4.742)	(5.951)	(3.105)	(4.950)	(2.255)	(4.275)	(5.045)	(0.651)	(2.982)	(4.950)	(3.316)
ln real GDP pc (t-1)	-0.073***	-0.069***	-0.061***	-0.048***	-0.101***	-0.020*	-0.038*	-0.046	-0.039**	-0.075***	-0.046**	-0.075***
	(-4.002)	(-4.828)	(-4.519)	(-2.853)	(-3.084)	(-1.869)	(-1.889)	(-1.236)	(-2.018)	(-4.576)	(-2.237)	(-3.303)
ln govt. headline balance (t-1)	0.442	-0.526**	-0.803***	0.115	1.073	-0.457	-0.192	0.409	-0.376*	0.106	0.371	0.314
	(0.711)	(-2.273)	(-2.804)	(0.341)	(1.346)	(-1.046)	(-0.426)	(0.952)	(-1.813)	(0.182)	(0.912)	(0.461)
ln unemp. rate (t-1)	0.006	0.027	0.021	0.013	0.007*	0.023	0.028	0.026	0.024	0.022	0.015	0.031*
	(0.260)	(1.502)	(1.045)	(1.189)	(1.867)	(1.042)	(1.024)	(1.003)	(0.728)	(0.767)	(1.101)	(1.849)
ln openness (t-1)	-0.012	-0.005	-0.018	-0.017	0.017	-0.005	0.001	0.020	-0.016	-0.010	-0.007	-0.003
	(-0.437)	(-0.301)	(-1.422)	(-0.788)	(0.511)	(-0.364)	(0.070)	(1.166)	(-0.404)	(-0.286)	(-0.264)	(-0.094)
ln share pop > 65 (t-1)	0.022	-0.019	-0.032	-0.011	-0.020	0.012	0.024	0.044	-0.018	0.027	-0.013	0.018
	(0.322)	(-0.408)	(-0.731)	(-0.274)	(-0.232)	(0.292)	(0.403)	(0.723)	(-0.221)	(0.292)	(-0.273)	(0.240)
ln # school years (t-1)	-0.245**	-0.307**	-0.235*	-0.259***	-0.152*	-0.052	-0.172*	-0.108	-0.154	-0.250**	-0.165***	-0.212*
	(-2.238)	(-2.464)	(-1.929)	(-2.712)	(-1.863)	(-1.542)	(-1.758)	(-1.264)	(-0.943)	(-2.110)	(-3.041)	(-1.730)
ln education exp. (t-1)		-0.115***										
		(-2.631)										
ln health exp. (t-1)			-0.058									
			(-1.577)									
ln other wages/interm cons. exp. (t-1)				-0.078								
				(-0.992)								
ln old-age & survivor pensions exp. (t-1)					0.067							
					(1.561)							
ln sickenss and disability exp. (t-1)						-0.036**						
						(-2.368)						
ln unemployment benefits exp. (t-1)							-0.011					
							(-0.867)					
ln family and children exp. (t-1)								-0.044*				
								(-1.890)				
ln subsidies exp. (t-1)									-0.009			
									(-0.286)			
ln investment exp. (t-1)										-0.026		
										(-0.743)		
ln other primary exp. (t-1)											-0.033	
											(-0.911)	
ln property income paid exp. (t-1)												0.015
												(0.643)
# observations	143	87	87	77	105	116	106	112	141	140	75	140
# countries	28	28	28	27	27	27	27	27	28	28	27	28
Max # of obs per country	8	4	4	4	6	6	6	6	8	8	4	8
Min # of obs per country	2	2	2	1	1	1	1	1	2	2	1	2
Avg # of obs per country	5,1	3,1	3,1	2,9	3,9	4,3	3,9	4,1	5,0	5,0	2,8	5,0
Short-term effect fiscal item (size)		-0,115	-0,058	-0,078	0,067	-0,036	-0,011	-0,044	-0,009	-0,026	-0,033	0,015
Short-term effect fiscal item (p-value)		0,009	0,115	0,321	0,119	0,018	0,386	0,059	0,775	0,457	0,362	0,520
Long-term effect fiscal item (size)		-0,187	-0,127	-0,125	0,108	-0,115	-0,025	-0,086	-0,026	-0,039	-0,058	0,026
Long-term effect fiscal item (p-value)		0,001	0,142	0,227	0,192	0,016	0,410	0,010	0,747	0,410	0,263	0,517
AR(1) (p-value)	0,08	0,05	0,07	0,06	0,08	0,04	0,08	0,09	0,06	0,10	0,06	0,12
AR(2) (p-value)	0,85	0,30	0,36	0,28	0,75	0,86	0,88	0,61	0,26	0,99	0,30	0,86
Hansen (p-value)	0,96	0,41	0,98	0,91	0,51	0,63	0,94	0,75	0,91	0,96	0,55	0,98
# instruments	38	26	35	32	28	28	37	31	36	39	29	39

Note: The short- and long-term effects report the size and significance level of the fiscal expenditure items, i.e. expenditure for education, health, old-age and survivor etc. For more details on the estimation approach used, see note of Table III.3.3. ***, ** and * denote respectively statistical significance at 1, 5 and 10%.
Source: Author's calculations.

4. FISCAL POLICY AND ECONOMIC FLUCTUATIONS: AN ANALYSIS OF AUTOMATIC STABILISERS ACROSS INCOME GROUPS

This chapter analyses the functioning of the automatic counter-cyclical stabilisation effects of fiscal policy on income, consumption and GDP across income groups in the 28 Member States for 2014. It investigates how the redistributive policies help to stabilise the economy in case of an economic shock to market/gross income (i.e. before taxes and benefits). While redistributive policies, and in particular the tax and benefit systems reviewed in Chapter III.3, aim at reducing inequality, they have also the side effect to help to stabilise the economy following economic shocks via direct income support.

While the stabilisation of the economy over the economic cycle is a key function of fiscal policy, ([127]) **there are typically two ways to conduct counter-cyclical fiscal policy**. First, policy-makers can rely on the *existing*, i.e. *unchanged*, legal provisions of the expenditure and revenue of a country. Most revenue items, in particular a progressive income tax rate, but also a few expenditure items (notably unemployment benefits) are highly correlated with the economic cycle. As a consequence, the government budget automatically worsens in downturns and stabilises the economy unless policy-makers actively counteract that effect. ([128]) That property is labelled "automatic stabilisation". ([129]) Second, policy-makers can implement *ad-hoc*, i.e. *discretionary*, fiscal policy measures to accommodate output fluctuations. ([130])

This chapter analyses the *direct* and *total* effects of the automatic (as opposed to ad-hoc) stabilisers on income and demand. The literature has used two different approaches to analyse the size of automatic stabilisers (Box III.4.1). First, the microeconomic-based approach focuses on the stabilisation properties of the tax and benefit system and their *direct* effect on disposable income and consumption using household data. ([131]) Second, the macroeconomic-inspired approach concentrates on the overall fiscal policy and its *total*, i.e. direct and indirect, impact on disposable income, consumption and GDP, taking into account behavioural responses macroeconomic effects.

The chapter is thus structured in two sections:

- **It first analyses the *direct* automatic stabilisation effects of the tax and benefit system on income and consumption for 2014 using the microsimulation model EUROMOD** (Section III.4.1.). It calculates indicators of automatic stabilisation through the tax and benefit systems with EUROMOD based on household data from the EU statistics on Labour and Income Conditions (EU-SILC) for 28 Member States and Eurostat and the Family Resource Survey for the UK (see Annex III.3 for a description of EUROMOD). In line with the previous literature, the shock is modelled in a stylised way as a 5% proportional shock reducing market income across all households. A key underlying assumption is that the employment status of the individuals will not change. As a consequence, the measured size of automatic stabilisers is likely to be underestimated, since unemployment will probably increase following such a deep shock, resulting in higher expenditure on unemployment benefits. ([132])

([127]) Musgrave (1959).

([128]) For an assessment of this effect in EU Member States during the crisis, see Part III of European Commission (2015).

([129]) Auerbach and Feenberg (2000) define automatic stabilisers as "… those elements of fiscal policy that tend to mitigate output fluctuations without explicit government intervention". The authors describe a progressive income tax as a typical example of an automatic stabiliser. By increasing (reducing) the incidence of tax liabilities on market incomes during booms (recessions), a progressive income tax acts as a smoothing factor on demand with respect to the business cycle.

([130]) There has been an intense discussion on the functioning of discretionary fiscal policy. Some argue that it is an ineffective tool e.g. due to (too) long implementation lags (e.g. Taylor, 2009). Others, in contrast, argue that automatic stabilisers alone are not sufficient to smooth incomes at least in case of a deep economic shock, requiring complemented action from discretionary fiscal policy (e.g. Christiano et al., 2011).

([131]) Musgrave and Miller (1948); Auerbach and Feenberg (2000); Brandolini et al. (2014); Dolls et al. (2012); Dolls et al. (2015) and Feyrer and Sacerdote (2013).

([132]) DiMaggio and Kermani (2016).

Box III.4.1: **Indicators of automatic stabilisers of income and consumption: micro- vs. macro-perspective**

The box describes the indicators used in this chapter to quantify the size of the *automatic* (as opposed to discretionary) stabilisation effects of income and consumption (i.e. demand). It is useful to distinguish between a micro- and macroeconomic perspective on automatic stabilisation.

A. Microeconomic perspective on automatic stabilisation: focus on direct effects (Section III.4.1.)

Automatic stabilisers used in the microeconomic literature aim at identifying the direct effects of the tax and benefit system in cushioning an economic shock. ([1]) This strand of literature typically assumes a certain shock on market income (i.e. before taxes and benefits) and quantifies the direct stabilisation effect of the tax and benefit system on households' disposable income and consumption using a microsimulation model.

Two indicators are calculated in this chapter using the microsimulation model EUROMOD:

The first indicator quantifies the size of the automatic stabilisation of *income* (τ_h^{micro}). It measures the direct cushioning effect of the tax and benefit system on households' disposable income following an exogenous 5% shock, which reduces households' market income under the assumption that all the household members were to experience at once the same income shock. It is therefore defined as the (negative) change in net transfers (i.e. taxes paid (T) minus benefits received (B)) following a shock to market income. The income stabilisation coefficient can be expressed as follows:

$$\tau_h^{micro} = \frac{\Delta(T_h - B_h)}{\Delta Y_h^M} = \frac{\Delta Y_h^M - \Delta Y_h^D}{\Delta Y_h^M} = 1 - \frac{\Delta Y_h^D}{\Delta Y_h^M}$$

where $\Delta Y_h^M (\Delta Y_h^D)$ measure the change of the market (disposable) income of household h before and after the economic shock. The income stabilisation coefficient measures the share of disposable income which is absorbed following a shock to market income due to the tax and benefit system. In absence of a tax and benefit system, the entire amount of a change in market income would affect disposable income and the income stabilisation coefficient (ISC) would be equal to zero per cent. Taxes and benefits, however, reduce the extent to which a shock to market income is transmitted to disposable income. The larger the ISC, the more stable is the household's disposable income following a shock to market income thanks to the shock-absorbing impact from the tax and benefit system. While τ_h^{micro} is defined for each household, country-specific coefficients are calculated as averages of the household-specific ones. ([2]) The income stabilisation coefficients are computed based on the tax and benefit rules for 2014 using 2012 data from the EU-SILC for 28 EU countries and the Family Resource Survey for the UK, which are uprated to 2014 to match the year for which the policy system is analysed. ([3])

Apart from the stabilisation of income, the stabilisation of consumption (i.e. demand) plays an important role for the real economy. Households usually do not cut consumption by the full amount of disposable income reduction, but use part of their savings to compensate for their loss in market income. This (dis-)saving behaviour adds to the income smoothing effect from the tax and benefit system, when

([1]) It goes back to the seminal paper by Pechman (1973) and has been developed in recent years in particular by Knieser and Ziliak (2002), Auerbach (2009) and Dolls et al. (2012).

([2]) While Dolls et al. (2012) report stabilisation coefficients at the country level only, we prefer using household-specific coefficients, since it allows analysing the heterogeneity of the stabilising effect of the tax and benefit system across households. For sensitivity purposes, we also calculate stabilisation coefficients based on the individual level (see Section A3.2 in Annex III.3 for more details). Overall, the findings do not change fundamentally so that this chapter focuses on the indicators derived from the household and country level.

([3]) For each income source, some factors are applied (i.e. consumer price index, average earnings increase, legal variations in benefit amounts, or other specific indexes as appropriate) to bring the income values from the income reference period up to the level of the policy year (see Sutherland and Figari, 2013).

(Continued on the next page)

Box (continued)

considering the impact on consumption. A crucial assumption for the evaluation of the automatic demand stabilisation is therefore how much of the change in disposable income is spent for consumption, which is captured by the marginal propensity to consume. ([4])

Therefore, the second indicator measures the size of the automatic stabilisation of consumption (i.e. demand) (θ_h^{micro}). It measures the cushioning effect of the tax and benefit system on households' consumption following a positive and exogenous 5% shock on households' market income assuming that all the household members were to experience at once the same income shock. The demand stabilisation coefficient can be expressed as follows:

$$\theta_h^{micro} = 1 - \frac{\Delta C_h}{\Delta Y_h^M} = 1 - \frac{\alpha_h * \Delta(Y_h^M - T_h + B_h)}{\Delta Y_h^M} = 1 - \frac{\alpha_h * \Delta Y_h^D}{\Delta Y_h^M} = 1 - \frac{\Delta Y_h^D}{\Delta Y_h^M} + (1 - \alpha_h)\frac{\Delta Y_h^D}{\Delta Y_h^M}$$

where the change in consumption before and after the economic shock (ΔC_h) is computed as the marginal propensity to consume of household h (α_h) multiplied by the change of disposable income (ΔY_h^D). The consumption stabilisation coefficient measures the share of consumption which is absorbed following a shock to market income due to the tax and benefit system and the marginal propensity to consume. The coefficient can be decomposed in two parts: (i) the income stabilisation coefficient plus (ii) the degree of (dis-)saving that smooths the consumption behaviour of the shock transmitted to disposable income. If consumption does not react at all to the shock ($\alpha_h = 0$), the demand stabilisation coefficient reaches its maximum at 100%. Conversely, if consumption reacts fully to the change in market income ($\alpha_h = 1$), the demand stabilisation coefficient is equal to the income stabilisation coefficient. The marginal propensities used for all 28 EU countries are derived from estimates for Italy, taking into account that poorer households tend to consume a higher share of their additional income than richer ones. ([5]) The calculations are therefore only an approximation of the "true" degree of demand stabilisation.

B. Macroeconomic perspective on automatic stabilisation: focus on total effects (Section III.4.2.)

Automatic stabilisers used in the macroeconomic literature try to capture the total, i.e. direct and indirect, effects of fiscal policy in cushioning an economic shock. The design of automatic stabilisers can influence the behaviour of individuals through several channels, e.g. by influencing labour supply and/or capital accumulation. ([6]) Using a macroeconomic general equilibrium model like QUEST makes it possible to capture those behavioural responses and to take into account other constraining factors such as the (inter-temporal) budget constraint to avoid the possibility of Ponzi behaviour. Moreover, using general equilibrium models allows to distinguish between different types of shocks (e.g. temporary vs. permanent or demand- vs. supply-side shocks) and between different types of agents affected by the shocks (e.g. credit-constrained versus non-credit-constrained (Ricardian) agents).

In this chapter the macroeconomic-based automatic stabilisers are computed using the general equilibrium model QUEST. To allow for a meaningful comparison between macro- and micro-perspective, the shock to disposable income generated in QUEST tries to replicate as much as possible the shock on market income under EUROMOD. ([7])

The calculation of automatic stabilisers in macroeconomic models requires the choice of a benchmark scenario, representing a hypothetical situation where automatic stabilisers do not operate. In a macroeconomic equilibrium model, it is necessary to define automatic stabilisers as the difference with respect to a benchmark scenario. ([8]) This benchmark defines what *would* happen to the budget following a

([4]) The marginal propensity to consume is defined as the impact of a marginal change of income on consumption.
([5]) In this chapter the following marginal propensity to consume are assumed: 60% for households belonging to the poorest quintile of the income distribution, 52% (2nd quintile), 46% (3rd quintile), 41% (4th quintile) and 36% for the richest quintile (see Jappelli and Pistaferri, 2014).
([6]) See McKay and Reis (2016).
([7]) See Box III.4.2 for further details.
([8]) See in 't Veld et al. (2013).

(Continued on the next page)

Box (continued)

shock if *automatic stabilisers are absent*. To put it differently, this benchmark depicts a counter-factual scenario, where automatic stabilisers are "switched off". We follow the literature and use here a simple benchmark, assuming that the budget is unchanged *in levels*. ([9]) This assumption allows having a coherent analysis between the micro and macro models. The benchmark implies that a decline in revenues and a possible increase in expenditures caused by a shock are offset by other measures taken by the government. Generally, these measures take the form of lump sum taxes and lump sum benefits, which are considered to be a *neutral* form of taxes and transfer, not distorting the behaviour of the economic agents. While these measures are frequently used in model simulations, they are rarely used in policy-making.

The macro approach used here assesses the impact of automatic stabilisation on income, consumption and GDP with respect to a benchmark scenario, in which the automatic stabilisers do not operate and tax and expenditures are fixed in levels. The stabilisation coefficient can be therefore expressed as:

$$\varphi_c^{macro} = 1 - \frac{\Delta X}{\Delta X_{benc\,hmark}} = 1 - \frac{\Delta X}{\Delta X_{LS}}$$

where X stands for income, consumption or GDP, ΔX measures the change in X induced by the economic shock in the absence of any discretionary policy intervention, while the benchmark is defined as the change in X assuming that the level of public revenue and expenditures is kept constant through the use of non-distortive (i.e. lump sum) taxes and transfers (ΔX_{LS}).

A comparison of the direct effects of automatic stabilisation on income and consumption derived from the micro- and macroeconomic approach is meaningful. At first glance, the comparison between income and demand stabilisation coefficients seems to be not telling, since the denominators under the micro- (ΔY_h^M) and macroeconomic approach (ΔY_{LS}) appear to be different. However, under the assumption that the tax and benefits are constant before and after the shock in monetary terms, the denominators are identical and a meaningful comparison becomes feasible. ([10]) A comparison of the direct automatic stabilisation coefficients on GDP derived from the micro and macro approach is not possible, since this effect cannot be calculated using the micro approach.

([9]) An alternative benchmark used in the literature assumes that the budget would not change as a ratio to GDP (see in 't Veld et al., 2013). It assumes that expenditures are indexed to GDP, which constitutes a rather generous benchmark.

([10]) The change in market income is equal to the change in disposable income in a world in which tax and benefits are constant in monetary terms, as $\Delta Y_{LS}^D = \Delta Y^M - \overline{T_{before} + B_{before}} + \overline{T_{after} - B_{after}} = \Delta Y^M$ as far as tax and benefits before and after the shock are equal due to their lump sum nature. Therefore, the counterfactual used in micro analysis is a pure lump sum world.

- **The chapter then analyses the *total* automatic stabilisation effects of fiscal policy on income, consumption and GDP using the macrosimulation model QUEST** (Section III.4.2.). It analyses the stabilisation properties of fiscal policy at large (as opposed to the focus on the tax and benefit system in the previous section). For that exercise, the macrosimulation model QUEST ([133]) is used, assessing the impact of a shock of similar size than in EUROMOD. That approach captures the total, i.e. direct and indirect, effects, including the behavioural responses of agents and the debt sustainability constraints of the government. As a result, it represents the total effects under the assumption that the economy functions as predicted under a standard new-Keynesian world.

The micro- and macroeconomic approaches are complementary to each other. The micro approach measures the immediate *direct* stabilisation impact on households' income following a large shock, allowing for a high level of granularity. The macro approach complements the micro approach by measuring the *total* effects, i.e. including direct and indirect effects. In

([133]) QUEST is the European Commission's dynamic stochastic general equilibrium model (DSGE) used for the analysis of fiscal and structural reforms (see Ratto et al., 2009 and Coenen et al., 2012).

addition, it enables to distinguish between different types of shocks. ([134]) While the macro approach is therefore more exhaustive in terms of the total economic effects, it does not capture the impact of the income distribution across households. Moreover, the macroeconomic approach requires determining a counterfactual scenario, i.e. a scenario where automatic stabilisers do not operate, ([135]) which is challenging (see Box III.4.1 for more detailed explanation).

4.1. AUTOMATIC STABILISATION OF INCOME AND DEMAND IN THE EU: A MICROECONOMIC PERSPECTIVE ([136])

4.1.1. Automatic stabilisation of income

Automatic income stabilisation is measured as the share of a shock to market income, which is absorbed by a country's tax and benefit system (Box III.4.1). In absence of a tax and benefit system, the entire amount of a change in market income would affect disposable income (i.e. income after tax and benefits) and the income stabilisation coefficient (ISC) would be equal to zero per cent. Taxes and benefits, however, reduce the extent to which a shock to market income is transferred to disposable income. ([137]) The larger the ISC, the more stable is the household's disposable income following a shock to market income thanks to the shock-mitigating impact from the tax and benefit system. Note that the simulations under EUROMOD may underestimate the impact from some social transfers for two main reasons. First, the simulations do operate under the 'no-status-change assumption', which rules out that some households will become eligible for certain benefits following an economic shock to market income. ([138]) Second, if the amount received of a certain benefit item does not change following the shock to market income, this benefit does not contribute to the stabilisation of income. This means that benefits which hardly vary with market income, have a very small impact on automatic stabilisation.

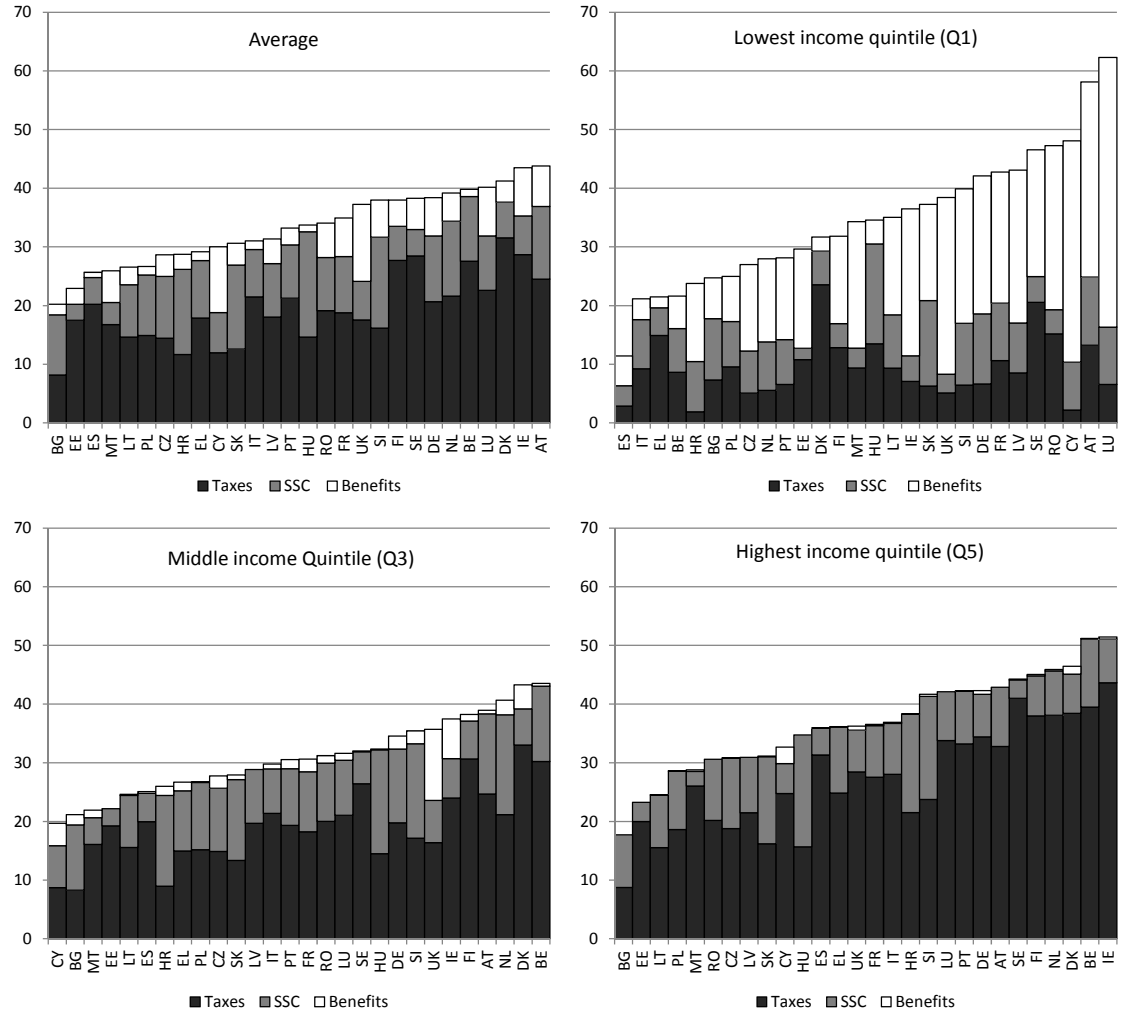
The average degree of automatic income stabilisation in the EU is around 33%, ranging from 20 to 45% across Member States (top-left panel of Graph III.4.1). ([139]) An income stabilisation coefficient of 33% means that 33% of a shock on market income is absorbed by the tax and benefit system. Bulgaria and Estonia experience the lowest average level of income stabilisation with values close to 20%. On the other hand, Denmark and Ireland show the highest income stabilisation coefficients with values close to 45%.

Direct taxes represent on average the main source of income stabilisation, followed by social security contributions and benefits (top-left panel of Graph III.4.1). The comparison does not include pensions, since they hardly vary with market income and in cases where a pensioner's income only consists of pensions (i.e. zero market income), the indicator cannot be computed.

The income stabilisation effects mostly result from social transfers spent for low-income households and from direct taxes paid by high-income households. The importance of transfers and taxes in stabilising income depends on the household income. In most Member States, social benefits play a key role in stabilising the income of households from the poorest quintile of the income distribution (top-right panel of Graph III.4.1). The role of benefits is less pronounced when focusing on households from the third quintile of the income distribution and it is almost negligible when analysing the richest 20% (bottom panels of Graph III.4.1). Taxes, on the contrary, tend to play a relatively larger role in stabilising the income,

([134]) Brunila et al. (2003).
([135]) For a discussion see Box III.4.1 and in 't Veld et al. (2013).
([136]) In this section automatic stabilisation coefficients are based on the household level. Annex III.3 includes robustness tests for coefficients based on the country and individual level. Overall, the results are broadly robust to the indicator used.
([137]) As an example, suppose that a 10% tax is levied on market income and that an exogenous shock causes them to decrease from 100 monetary units to 50 units. Income after tax would decrease from 90 units to 45 units, implying that a reduction of 50 monetary units of market income determines a reduction of 45 units in disposable income. Hence only 90% of the shock is actually transmitted to disposable income, while the ISC would be equal to 10%, which is the shock's share absorbed by the tax system.
([138]) EUROMOD operates under the so-called 'no-status change assumption': households, which have been employed (unemployed) before the shock, will remain employed (unemployed) after the shock.
([139]) The slightly higher income stabilisation coefficients identified by Dolls et al. (2012) can be mainly explained by the different time horizons of the analysis () and the use of different (country- vs. household level).

Graph III.4.1: **Automatic income stabilisation coefficients**



Note: The graph shows the size of automatic income stabilisation by type of fiscal instrument for the 28 Member States on average as well as for selected income quintiles. As highlighted in the main text, the comparison does not include pensions. The country average is calculated as the average across households belonging to the same quintile. Quintile 1/3/5 represent the bottom 20/middle 40-60/top 20% of the income distribution.
Source: Author's simulations based on EUROMOD using EU-SILC data.

the higher the household income (Graph III.4.1). There is no clear pattern of the role of social insurance contributions across income quintiles.

To find out whether the magnitude of income stabilisation depends on the progressivity of the tax and benefit system, the income stabilisation is compared with the stabilisation arising from a flat tax (and benefit) system. ([140]) The income stabilisation coefficient based on the proportional (flat) tax system is labelled the average effective tax rate (AETR). It is defined as the rate which –applied to the aggregate market income in each country– would generate an aggregate level of disposable income equivalent to the one observed. Consequently, the AETR would assure that the net transfers from family to governments would stay at the same level as the actual ones. ([141]) Note that the AETR does not include pensions.

([140]) A means-tested benefit is a payment made to agents whose income and wealth are below specified limits.

([141]) More formally, being $\sum O_i$ the aggregate level of market income, $\sum Y_i$ the aggregate level of disposable income of household i, defined as market income minus taxes paid (T) plus benefits received (B), i.e.:

The tax and benefit systems provide a larger degree of income stabilisation than the equivalent tax and benefit system consisting of a flat tax rate equal to the AETR. The larger the difference between the AETR and income stabilisation coefficients (i.e. the larger the white bars in Graph III.4.2), the larger the progressivity of the tax and benefit system and/or the more important the means-tested allocation of benefits in a given country. The largest differences are observed in Ireland and Cyprus, the smallest in Poland and Greece. In particular, the large progressivity in Cyprus is driven by relatively low incidence of the personal income tax and social insurance contribution on market income and a comparatively large incidence of benefits which tend to reduce the AETR to the value of 8%. In Ireland, a high incidence of benefits reduces the AETR, despite a larger incidence of taxes and social insurance contribution on market incomes than in Cyprus. By contrast, the incidence of benefits on market income is relatively small in Poland and Greece, where the relatively low progressivity of the tax and social insurance contribution system reduces the gap between the income stabilisation coefficient and the AETR.

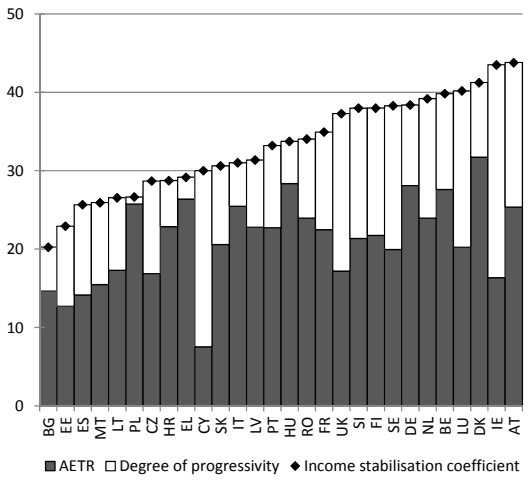
At least three different patterns of income stabilisation across income quintiles can be distinguished (Graph III.A3.2 in Annex III.3).

- **In some Member States the income stabilisation coefficients increase with household income** (e.g. IT, BE, ES). This is due to the progressivity of the tax system which generates higher income stabilisation at the top of the income distribution and comparatively low degree of means-tested benefits for low-income earners.

- **In other Member States, the income stabilisation coefficients increase with household income except for the low-income households, which produce a relatively high level of income stabilisation** (e.g. AT, DE, FR). In those Member States, the progressivity of the tax and benefit system leads to increasing income stabilisation coefficients across income quintiles. In addition, means-tested benefits contribute to a high level of income stabilisation at the bottom of the income distribution. Overall, this results in stabilisation coefficients, which are v- or u-shaped across income quintiles.

- **Finally, in some Member States the income stabilisation coefficients are rather flat across income quintiles** (e.g. HU, PL). In these Member States the tax systems tend to be rather flat, while transfers are relatively small and have little impact on stabilising incomes.

Graph III.4.2: **Progressivity of the tax system and income stabilisation**



Note: The graph compares the degree of automatic income stabilisation (in per cent) of the current tax and benefit system with the degree of stabilisation assuming a hypothetical average effective tax rate (AETR).
Source: Author's simulations based on EUROMOD using EU-SILC data.

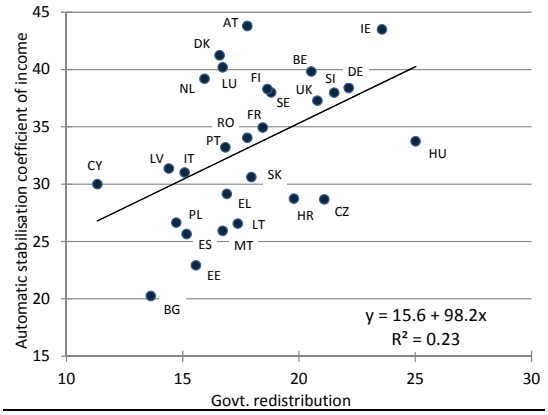
Higher spending for government redistribution is weakly correlated with higher income stabilisation (Graph III.4.3). The higher the government redistribution of a country, the more it tends to stabilise disposable income. There is, however, a high heterogeneity across Member States. As a consequence, a similar level of redistribution through the tax and benefit system can lead to different automatic stabilisation

$$AETR \overset{def}{=} 1 - \frac{\sum Y_i}{\sum O_i} \overset{yields}{\longrightarrow} \sum O_i * (1 - AETR) = \sum Y_i$$
$$\overset{yields}{\longrightarrow} \sum O_i * AETR = -\sum T_i + \sum B_i$$

It should be noted that only households with at least one member receiving market incomes and with no pensioners are included in the AETR calculations. The choice is due to the difficult classification of pensions as government transfers or a return on the contributions paid during the working life. AETR should be interpreted as an average effective tax rate for the working population.

coefficients (see for example AT and LT). On the other hand, countries with similar income stabilisation coefficients can witness different levels of government redistribution (see for instance HU vs. PT).

Graph III.4.3: **Relationship between government redistribution and stabilisation of income**



Note: The graph shows the relationship between government redistribution and the size of automatic stabilisation of income. Government redistribution is measured as the difference between the Gini indices of market and disposable income.
Source: Author's calculations based on the EUROMOD model using data from EU-SILC for the average period 2004 to 2014.

4.1.2. Automatic stabilisation of consumption (demand)

Demand stabilisation coefficients measure the cushioning effect of the tax and benefit system on households' consumption following a shock on market income (for more details see Box III.4.1). Typically, households hit by an economic shock do not cut consumption by the full amount of disposable income reduction, but use part of their savings to compensate for their loss in market income. A crucial assumption for the evaluation of the automatic demand stabilisation is therefore how much of the change in disposable income is spent for consumption, which is captured by the marginal propensity to consume. ([142]) The demand stabilisation coefficient therefore depends on two factors, namely (i) the (dis-)saving behaviour of households and (ii) the change in disposable income, which, in turn, is equal to the change in market income minus net transfers.

Demand stabilisation coefficients are larger than income stabilisation coefficients, since households do not cut consumption by the full amount of disposable income reduction. The demand stabilisation coefficient reaches 100% if consumption does not react at all to the shock to market income, while it is equal to the income stabilisation coefficient if consumption fully reacts to the change in market income.

There is less heterogeneity in consumption stabilisation than in income stabilisation, although significant differences across countries exist (Graph III.4.4). The demand stabilisation coefficient for the EU average is around 70%, ranging from 64% in Bulgaria to 75% in Ireland. A demand stabilisation coefficient of 70% means that 70% of the consumption is absorbed following a shock on market income due to the tax and benefit system and the marginal propensity to consume. The variation across countries is more homogenous when compared to income stabilisation coefficients, which can be explained by the assumptions on the marginal propensity to consume. The tax and benefit systems provide a larger degree of consumption stabilisation than the equivalent tax and benefit system consisting of a flat tax rate equal to the AETR. The larger the difference between the AETR and demand stabilisation coefficients (i.e. the larger the white bars in Graph III.4.2), the larger the progressivity of the current tax and benefit system and/or the more important the means-tested allocation of benefits in a given country.

The demand stabilisation coefficients for high-income households tend to be higher than for low-income households. This can be explained by the lower marginal propensity to consume of richer compared with poorer households. ([143])

Sensitivity analyses suggest that increasing the marginal propensity to consume leads to a reduction in demand stabilisation. Due to the uncertainty regarding the estimates for the marginal propensity to consume, ([144]) we calculate

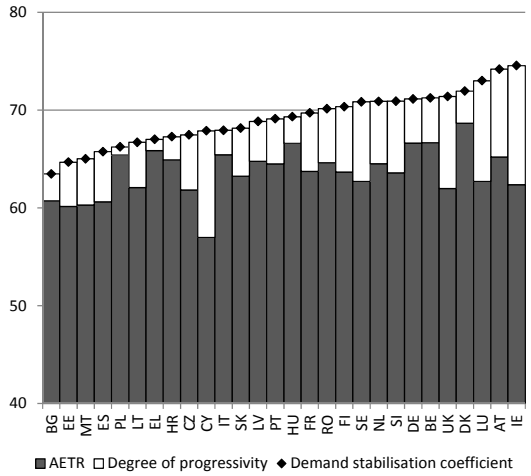
([142]) The marginal propensity to consume is defined as the impact of a marginal change of income on consumption. For more details see Box III.4.1.

([143]) This holds even if it is not the case for the income stabilisation coefficient.

([144]) Marginal propensities to consume cannot be considered constant functions of the individual characteristics, in that they also depend on external economic conditions; typically on the situation in the financial system.

the demand stabilisation coefficients with larger and lower marginal propensities to consume (Graph III.A3.3 in Annex III.3). As a result, the demand stabilisation coefficients decline (increase) if larger (lower) marginal propensities to consume are used, since consumption becomes more (less) responsive to income shocks.

Graph III.4.4: **Automatic demand stabilisation coefficients**



Note: The graph shows the size of the automatic stabilisation coefficients of consumption (i.e. demand). The assumptions on the marginal propensity to consume of the households are taken from Jappelli and Pistaferri (2014) as explained in Box III.4.1.
Source: Author's simulations based on EU-SILC.

4.2. AUTOMATIC STABILISATION OF INCOME, DEMAND AND GDP IN THE EU: A MACROECONOMIC PERSPECTIVE

This section complements the analysis of the direct automatic stabilisation by assessing their total effect for Italy using the macro-simulation model QUEST. It takes into account the behavioural responses as well as the macroeconomic feedback effects, such as the government's constraint to achieve sustainable public finances over the medium-term as well as the impact from monetary policy and potential changes of the employment status following a large economic shock. It thus provides the total effects under the assumption that the economy functions as predicted under a standard new-Keynesian model. We focus on Italy mainly for two reasons: First, the used estimates for the marginal propensity to consume are derived based on data for Italy (see Box III.4.1). Second, Italy represents a large Member State with average automatic stabilisation coefficients for income and consumption.

To allow for a meaningful comparison of the stabilisation coefficients, the shock in QUEST is set up to mimic the shock in EUROMOD (Box III.4.2). Both models are designed to generate a 5% shock to market income. In doing so, QUEST, in contrast to EUROMOD, requires assumptions on the type of shock. The simulations shown here combine the effects of temporary shocks to total factor productivity and exports, reflecting a mix of demand and supply shocks. Given the focus on the stabilisation properties of the economic cycle, the analysis looks at the short-term impact and stabilisation properties of the model as represented by the effects in the first year after the shock.

The automatic stabilisation coefficients in QUEST are derived from the comparison between two scenarios: in the first, automatic stabiliser operate, in the second they do not operate (Box III.4.1, Table III.4.1).

- ***Scenario "on": Automatic stabilisers do operate*** (Table III.4.1 first column). This scenario results in a very negative economic environment, yielding a 4.9% decline in market income, which translates to a decline of real GDP by 4.2%. Disposable income reduces by -3.4%. Consumption declines by only 0.5%. This crucially depends on the presence of liquidity-constraint households.

- ***Scenario "off": Automatic stabilisers do not operate*** (Table III.4.1 second column). The benchmark scenario used here assumes that expenditure and taxes are kept constant at their baseline levels. ([145]) Government investment is fixed in real terms, while public sector wages are kept constant in nominal terms and public employment constant in levels. The level of unemployment benefits paid per unemployed is kept fixed in nominal terms, as is the total amount spent on other transfers to households. The cyclical components of tax revenues and the total amount spent on unemployment benefit payments are fully neutralised by offsetting

([145]) This follows in 't Veld et al. (2013).

changes in lump-sum tax and transfers from/to households. Under these assumptions, the impact to the economy is more detrimental than under scenario A, which assumes that the automatic stabilisers operate. GDP is supposed to decline by 4.5%, disposable income by 3.4% and consumption by 1%.

The automatic income stabilisation coefficient derived from QUEST compares with the one derived from EUROMOD (Table III.4.1)**.** According to the QUEST simulations, disposable income is stabilised by 29% given the particular temporary shocks to total factor productivity and exports. This compares to a coefficient of 33% computed using EUROMOD. The slightly lower income stabilisation coefficient under QUEST can be explained by the impact of indirect effects such as behavioural responses and macroeconomic feedback effects. For instance, the tax and benefit system may provide distortive incentives to work which can weigh on growth. In addition, the reaction of monetary policy following a shock is – everything else equal – supposed to be less expansionary in an environment with than without automatic stabilisation from the tax and benefit system.

Table III.4.1: **Degree of smoothing from automatic stabilisers (in %)**

	Stabilisers		Stabilisation coefficients	
	on	off	QUEST	EUROMOD
Market income	-4,9	-5,1		
Disposable income	-3,4	-3,4	29,1	33,3
Consumption	-0,5	-1,0	54,8	69,1
Real GDP	-4,2	-4,5	5,8	NA

Note: The table shows the size of automatic stabilisation of income, consumption and GDP using QUEST (see Box III.4.2 for more information)."on", "off" refer to scenarios in the text.
Source: Author's calculations.

The automatic consumption stabilisation is smaller in QUEST than in EUROMOD. According to the EUROMOD simulations, Italy's tax and benefit system and the marginal propensity to consume automatically stabilise around 70% of consumption following a shock to market income (Graphs III.4.4). This represents the direct effects on consumption smoothing. The total effect of consumption smoothing as measured by QUEST for that particular combination of shocks is around 55%. The reason is related to the presence of distortions as indicated above and to the fact that consumers that are not financially-constrained, already smooth their consumption behaviour contrary to what happens in EUROMOD.

The size of automatic stabilisation of GDP is much smaller than the stabilisation of consumption. Automatic stabilisation of GDP is of the order of 6%, which is much smaller than consumption stabilisation. Such a sizeable difference is related to the type of the shock, which is constructed as a combination of temporary shocks to labour productivity and export demand. Clearly, the automatic cushioning impact of such a shock is limited to employment, wage and engendered consumption effects. The shocks on investments and exports are not cushioned by the tax and benefit system, so that the government's objective to ensure a balanced budget will further reduce automatic demand stabilisation.

In QUEST the type of shock has a large impact on the size of the automatic stabilisers. Shocks that directly affect labour productivity tend to generate a large wage decrease that limits the impact on employment and therefore results in a limited operation of automatic stabilisers. On the other hand, shocks that have a large negative impact on demand (such as external shocks) depress labour demand and generate larger automatic stabilisers for income and consumption. It is important to stress that automatic stabilisers only work with temporary demand and supply shocks. In case of a permanent supply shocks require adjustment to the new equilibrium and automatic stabiliser would only slow down the adjustment process ([146]).

([146]) Buti and Franco (2005).

Box III.4.2: **Analysis of automatic stabilisers in QUEST**

This box presents the framework for analysing the automatic stabilisers using the macro-simulation model QUEST.

The QUEST simulations require the specification of a benchmark scenario, in which the automatic stabilisers do not operate. The simulations look at the effects of a combination of shocks to the Italian economy in two alternative scenarios: (i) a situation where automatic stabilisers are operating as normal and (ii) a benchmark scenario where automatic stabilisers do not operate, i.e. are switched off. The comparison between the two scenarios provides the total effect of automatic stabilisers. Expenditures and taxes are kept fixed at their baseline level and changes in lump-sum taxes neutralise the cyclical components of the budget.

To allow for a meaningful comparison between the direct effects in QUEST and EUROMOD, the shock used for QUEST is generated to ensure that the different components of income grow proportionally. In particular, workers with the same level of education receive the same wage; they work the same number of hours and therefore receive the same market wage income. Agents that are not liquidity-constrained receive also income from profits (e.g. from financial assets). In order to approximate the proportional shock to the income of agents used in the micro approach, the shock used in QUEST generates a roughly proportional growth in income from wages and profits for a period of 3 to 5 years after the shock hits the economy. This allows a reasonable comparison between the direct effects of automatic stabilisers derived from EUROMOD and QUEST.

The automatic stabilisation in QUEST depends on the type of shock. The simulations combine the effects of temporary shocks to total factor productivity and exports. The two shocks reflect a mix of demand and supply shock, resulting in a very negative economic environment as represented by a 2% temporary decline in total factor productivity and a negative temporary shock to exports of about 2.8%. This yields a 1% decline in aggregate market income in the first benchmark scenario. Given the linearity, we multiply the shock by 5 to mimic the shock designed under EUROMOD.

The findings show that automatic stabilisers can be sizeable. On the one hand, the degree of total smoothing of GDP fluctuations provided by automatic stabilisers after five years is around 10%, as GDP falls by 0.85% in the presence of automatic stabilisers as opposed to 0.90% in the benchmark. On the other hand, while consumption falls, the automatic stabilisers can absorb a sizeable proportion of the negative effect. This is due to the fact that consumption decisions are heavily affected by the tax and transfer system, in particular by the progressivity of labour taxation. The smoothing effect from the presence of automatic stabilisers mostly concerns liquidity-constrained household, as non-liquidity-constrained households can smooth their consumption over their whole life cycle.

The key findings are robust to the use of an alternative benchmark scenario. The findings reported above are based on the assumption that expenditures and taxes are kept fixed at their baseline level. For a robustness check, a second benchmark scenario is used, where expenditure and taxes are kept constant as a share of GDP and automatic stabilisers are switched off. ([1])

Overall, the results reported here should not be generalised, as they are shock-specific. For instance, in 't Veld, et al. (2013) report, for a combination of shocks that captures the impact of the Great Recession, a consumption smoothing of between 62% and 54%. The degree of consumption smoothing can be larger or lower for other type of shocks.

([1]) In 't Veld, et al. (2013).

5. CONCLUSIONS

This part raises three key questions on the impact of fiscal policy on income inequality, which can be answered as follows.

First, three fiscal policy instruments have been identified in the literature as main drivers of fiscal policy on income distribution, namely: (i) the tax and benefit system (i.e. social transfers in cash, direct taxes and social security contributions), (ii) social transfers in kind (such as the provision of education) and (iii) indirect taxes (i.e. mainly consumption taxes such as VAT). While those policy instruments tend to have a positive *direct* effect in reducing income inequality, they can trigger distortive *indirect* effects, which can (partly) offset the inequality-reducing impact.

Second, empirical evidence shows that fiscal policy had a significant impact in mitigating income inequality in the EU. While income inequality was in 2014 higher in almost all EU Member States than in 1980, its increase mainly results from a level shift of inequality in the 1990s. Since 2000, disposable income inequality has remained broadly unchanged in the EU, while inequality of market income slightly increased. The sizeable difference between market and disposable income can be explained by the inequality-mitigating impact from fiscal policy. The size of redistribution in the EU has increased steadily in recent decades, and stands today significantly above other major advanced economies.

Evidence from household data reveals that the tax and benefit systems had a significant *direct* impact in offsetting the rise in market inequality in the EU over 2004-2014. The inequality-mitigating impact from social transfers was larger than from direct taxes. Fiscal consolidation following the Great Recession was to a large extent borne by the upper part of the income distribution.

Evidence from panel regression analysis suggests that only some expenditure items significantly reduced income inequality in the EU on average between 1980 and 2014. This means that the total effect of fiscal policy on reducing inequality is smaller than its direct effect due to the existence of distortive indirect effects. Expenditures in education, health and allowances related to sickness and disability and family and children expenditure are the spending items whose effect in reducing inequality remains in the long run. Thus, a careful design of fiscal policy is key to ensure reduce excessive inequality and prevent distortive indirect effects.

Third, the tax and benefit systems play an important role in *directly* stabilising income and consumption over the economic cycle across income groups in Member States. Evidence from the microsimulation model EUROMOD shows that the degree of income and demand stabilisation is fairly high in the EU, but varies across Member States. Transfers to low-income households have a crucial role in shielding them from the risk of poverty. The more progressive the taxes are (resp. benefits), the larger the size of income stabilisation. Overall, our analysis does not allow deriving an optimal size of automatic stabilisers. ([147]) While an increase in social transfers and/or taxes would indeed lead to higher automatic stabilisers, this would likely increase economic distortions so that the impact on the total stabilisation effect remains unclear. Moreover, while automatic stabilisers help to cushion transitory income shocks, they may delay inevitable adjustment in the presence of permanent shocks. Overall, the findings show the importance of letting automatic stabilisers play freely in bad economic times, without undoing their effect as it may have happened in certain cases during the Great Recession.

The *total* stabilisation effects of fiscal policy are also smaller than its direct stabilisation effect. A positive side effect of the tax and benefit system is to provide stabilisation in income and consumption to households. Those direct cushioning effects are relatively sizeable in the EU, with roughly one third of the income absorbed by the tax and benefit system following a shock to market income. Consumption is even stabilised by half on average due to the tax and benefit system and the marginal propensity to consume. Overall, the total effect of income and demand stabilisation is smaller than its direct effect, as behavioural responses and

([147]) For a recent work on optimal automatic stabilisers see McKay and Reis (2017).

macroeconomic feedback effects can weigh on growth and thereby reduce the degree of stabilisation.

Overall, the chapter makes clear that fiscal policy needs to be carefully designed to balance equity, stabilisation and efficiency considerations, taking into account potentially harmful indirect effects. Recent calls for more government intervention and redistribution come at a time when government redistribution is close to its historical peak, public finances are constrained in many Member States and public debt ratios are close to their historical peak. A fine balancing between fairness considerations and risks for the future is therefore necessary.

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ANNEX 1
Supplement to Chapter III.2.

The following table provides an overview of estimations for an equivalent monetary impact of the provision of public services in terms of redistribution. It shows calculations of a "monetary value" for the delivery of health care, long-term care, education and childcare for the benefiting households. To account for the fact that the receipts of public services like education and healthcare are associated with particular needs, the consumption needs are also adjusted accordingly.

Table III.A1.1: **Equivalent monetary impacts of the provision of public services in terms of redistribution (additional distributive impact of in-kind benefits in 2009)**

Ireland	0,067
Luxembourg	0,062
Portugal	0,062
Spain	0,062
UK	0,061
Sweden	0,056
Denmark	0,055
Netherlands	0,055
France	0,054
Italy	0,052
Belgium	0,051
Estonia	0,049
Austria	0,048
Greece	0,047
Poland	0,046
Finland	0,045
Germany	0,045
Hungary	0,044
Czech Republic	0,043
Slovakia	0,042
Slovenia	0,04

Source: Aaberge et al. (2017).

Indirect taxation: methodology and detailed data

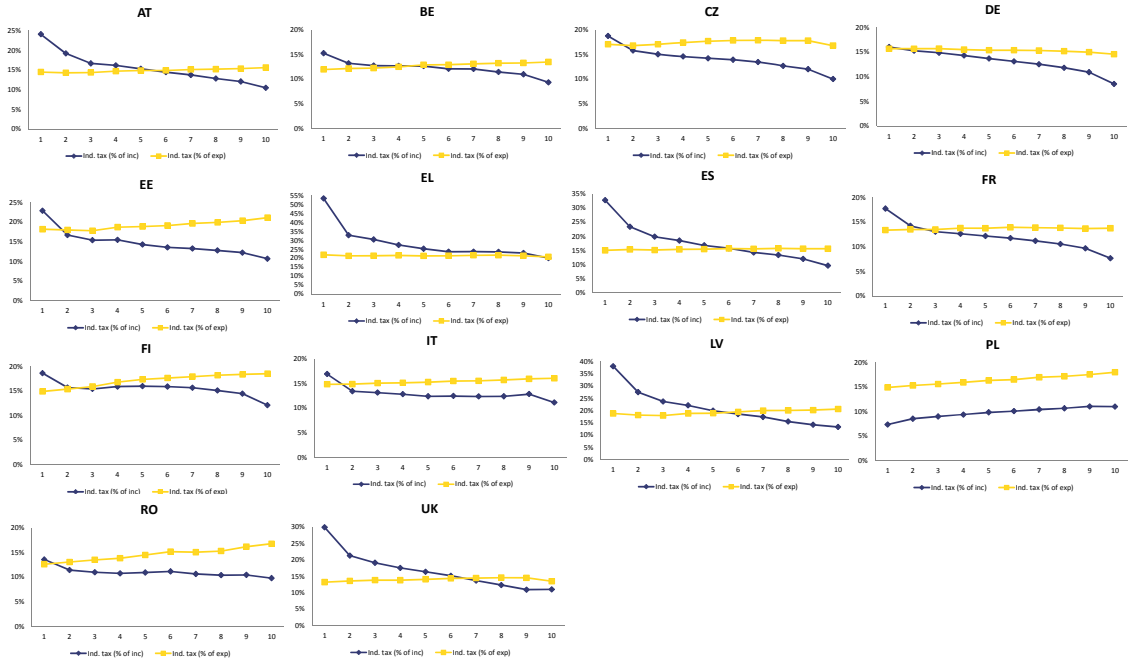
Modelling approach to the simulation of indirect taxes using EUROMOD

While tax shift reforms are seen as a way to promote growth friendly fiscal consolidation, their distributional consequences may be substantial. Against this background, a simulation of indirect taxes has been undertaken with EUROMOD. The project was conducted jointly by the Department of Economics of the University of Leuven and the Institute for Social and Economic Research (ISER) at the University of Essex.

EUROMOD is aimed initially at analysing direct taxation and benefits in cash. Extending the policy scope of EUROMOD to indirect taxes involves three main steps. ([148]) First, EUROMOD input data have to be enriched with information on household consumption expenditures. Second, EUROMOD needs to be equipped with a calculator for indirect tax liabilities. Third, behavioural assumptions have to be

([148]) The methodological approach is extensively explained in De Agostini et al. (2017).

Graph III.A1.1: **Indirect taxes as a percentage of disposable income and of expenditures (as a percentage of disposable income)**



Note: 2014 data for Germany, France, Italy, Spain; 2016 data for all the other Member States.
Source: Author's calculations based on EU-SILC.

imposed in order to study how changes in disposable income affect household expenditures and indirect tax liabilities.

In order to enrich EUROMOD input data with household-level information on expenditures, parametric Engel curves are estimated on the basis of Household Budget Surveys, which are aggregated to 15 non-durable and one durable commodity groups. ([149]) The estimated coefficients are subsequently used to impute aggregate expenditures into EUROMOD input data using the same set of control variables as in the estimation phase. For the simulation of tax liabilities, the indirect tax system (i.e., VAT rates as well as ad valorem and per unit excises) has been encoded at the detailed commodity level. In order to be applicable to imputed aggregate expenditures at consumer prices, a weighted sum of implicit indirect tax rates is computed in order to obtain households' indirect tax liabilities for a baseline policy year. Finally, simultaneous changes in direct and indirect taxes are simulated under the assumption that a constant share of income is devoted to each expenditure group, keeping the savings rate constant.

([149]) The commodity groups follow the Classification of Individual Consumption by Purpose (COICOP).

ANNEX 2

Supplement to Chapter III.3.

The EU-SILC database

The EU-SILC database is the major survey data set for comparative research on income equality and social inclusion in the European Union. ([150]) The survey collects detailed information on socio-demographic characteristics (age, educational background, health status), income sources (dependent or self-employed income, pension, investment income), and employment status (profession, working time, gross wages) for all members of the private households selected into the sample as well as information on household composition. The income reference period in EU-SILC is the year preceding the survey, e.g. 2011 for the EU-SILC operation of 2012. In 2012, EU-SILC covered around 591,482 individuals living in 237,478 private households in the 28 EU Member States. The EU-SILC database allows calculating indicators for market (i.e. before taxes and benefits) and disposable (i.e. after taxes and benefits) income, which consist of the following components (Table III.A2.1).

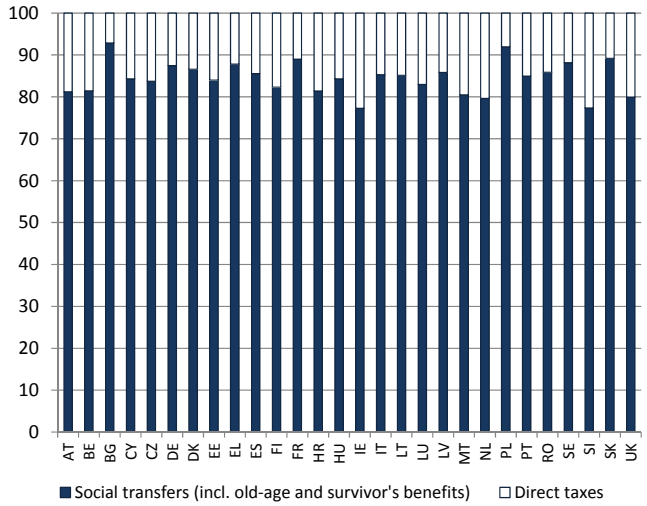
Table III.A2.1: **Components of market and disposable income**

Broad categories	More detailed categories	Market income	Disposable income
Labour income (incl. from self-employment)	• Gross employee cash or near cash income • Gross on-cash employee income • Gross cash benefits or losses from self-employment (including royalties)	✓	✓
Capital income	• Imputed rent • Income from rental of a property or land • Interests, dividends, profit from capital investments in unincorporated business	✓	✓
Other sources of market income	• Value of goods produced for own consumption • Regular inter-household cash transfers received • Income received by people aged under 16	✓	✓
Cash benefits and allowances	• Unemployment benefits • Old-age benefits (including pensions) • Survivor' benefits • Sickness benefits • Disability benefits • Education-related allowances • Family/children related allowances • Social exclusion not elsewhere classified • Housing allowances		✓
Direct taxes	• Tax on income and social insurance contributions • Regular taxes on wealth • Interest paid on mortgage		▪

Note: ✓(▪) means that the category provides a positive (negative) contribution to disposable or market income. See below for a description of EU-SILC variables and details on the items of direct taxes and social transfers included.
Source: EU-SILC database.

([150]) The database can be found at: http://ec.europa.eu/eurostat/web/microdata/european-union-statistics-on-income-and-living-conditions

Graph III.A2.1: **Contributions to government redistribution: direct taxes vs. social transfers (average 2004-2014)**



Note: This graph shows the contributions to government redistribution, distinguishing between direct taxes and social transfers (including pensions).
Source: Author's calculations based on EU-SILC.

Background information on Gini elasticities ([151])

The Gini elasticities measure the impact of a marginal increase in the tax or benefit source on inequality of disposable income, holding income from other sources constant. The Gini elasticity is equal to the original contribution of the income source (k) to inequality minus its share in total income: $\frac{\partial G/\partial e}{G} = \frac{S_k G_k R_k}{G} - S_k$.

Following Lopez-Feldman (2006) the decomposition of the Gini elasticities can be explained intuitively as follows:

- the share of the income source with respect to total income (S_k), i.e. if an income source represents a large share of total income, it may potentially have a large impact on inequality;

- how equally or unequally distributed the income source is (G_k), i.e. if the income is equally distributed ($G_k = 0$), it cannot influence inequality (no matter its magnitude);

- the correlation of the income source with the distribution of total income (R_k), i.e. if the income source is large and unequally distributed (S_k and G_k are large), it may either increase inequality (R_k is positive and large, meaning it targets those at the top of the distribution) or decrease it (R_k is negative or close to 0, meaning it targets poor households).

Mathematically, the components are defined as follows:

$$R_k = \frac{\sum_k Cov(Y_k \; ; \; Rank)}{\sum_k Cov(Y_k \; ; \; Rank_k)}$$

([151]) This approach is proposed by Lerman and Yitzhaki (1985); see also Lopez-Feldman (2006).

$$G_k = 2\frac{\sum_k Cov(Y_k\ ;\ Rank_k)}{mean\_income_k}$$

$$S_k = \frac{mean\ income_k}{mean\ income}$$

- Where Y_k is income from tax (benefit) k (to an individual consumer or household);
- *Rank* is the rank of the individual receiving the income in the distribution of total income as measured by the cumulative distribution of total income;
- $Rank_k$ is the rank of the individual in the distribution of income from tax(benefit) k as measured by the cumulative distribution of income from tax(benefit) k;
- $mean\ income_k$ is the mean income received from tax(benefit) k;
- $mean\_income$ is the mean total income.

So S_k represents the share of the specific tax(benefit) over total income, G_k represents the Gini index computed with respect to the distribution based on income from tax(benefit) k and R_k is the Gini correlation of income from tax(benefit) k with the distribution of total income.

Table III.A2.2: **Impact of sub-components of the cash-benefit system on income inequality (Gini elasticities in per cent, remaining EU countries, average 2004-2014)**

		Gini elast.	S	G	R		Gini elast.	S	G	R		Gini elast.	S	G	R		Gini elast.	S	G	R		Gini elast.	S	G	R	
1	AT	-0,19	0,49	-0,49	-0,85	DK	-0,19	0,66	-0,35	-0,92	HR	-0,14	0,40	-0,61	-0,83	LV	-0,05	0,39	-0,65	-0,71	SE	-0,20	0,55	-0,37	-0,93	EU 28	-0,14	0,46	-0,55	-0,81	1
2		-0,03	0,34	0,82	0,29		-0,21	0,15	0,89	-0,19		-0,08	0,32	0,79	0,23		-0,19	0,42	0,69	-0,01		-0,17	0,24	0,85	0,01		-0,12	0,34	0,79	0,14	2
3		-0,08	0,09	0,64	-0,15		-0,06	0,04	0,59	-0,30		-0,03	0,04	0,87	-0,15		-0,02	0,08	0,82	0,23		-0,10	0,09	0,67	-0,18		-0,05	0,07	0,74	-0,12	3
4		-0,03	0,05	0,93	0,04		-0,05	0,08	0,89	0,04		-0,11	0,22	0,80	0,05		-0,02	0,08	0,87	0,13		-0,06	0,08	0,85	-0,01		-0,04	0,08	0,89	-0,01	4
5		-0,03	0,03	0,91	-0,25		-0,10	0,07	0,86	-0,19		-0,01	0,02	0,97	0,01		0,00	0,03	0,94	0,24		-0,04	0,03	0,93	-0,21		-0,02	0,04	0,94	-0,04	5
6		-0,01	0,01	0,97	-0,48		-0,02	0,01	0,96	-0,66		-0,01	0,01	0,97	-0,57		-0,01	0,01	0,95	-0,29		-0,04	0,01	0,96	-0,74		-0,02	0,01	0,95	-0,45	6
1	BE	-0,18	0,52	-0,53	-0,78	EE	-0,10	0,43	-0,54	-0,89	HU	-0,17	0,39	-0,62	-0,73	MT	-0,15	0,44	-0,55	-0,91	SI	-0,28	0,51	-0,52	-0,85	EU 15	-0,16	0,50	-0,53	-0,82	1
2		-0,15	0,25	0,85	0,01		-0,19	0,34	0,75	-0,11		-0,05	0,38	0,75	0,28		-0,16	0,38	0,76	0,00		-0,08	0,24	0,80	0,13		-0,10	0,31	0,82	0,18	2
3		-0,06	0,08	0,65	-0,07		-0,04	0,12	0,75	0,13		-0,11	0,12	0,69	-0,21		-0,05	0,06	0,72	-0,28		-0,07	0,08	0,75	-0,12		-0,06	0,06	0,71	-0,16	3
4		-0,06	0,05	0,93	-0,22		-0,05	0,08	0,83	-0,12		-0,06	0,09	0,87	-0,03		-0,04	0,06	0,91	-0,11		-0,08	0,13	0,78	-0,03		-0,04	0,06	0,92	-0,01	4
5		-0,09	0,09	0,88	-0,20		0,00	0,02	0,97	0,13		-0,03	0,02	0,92	-0,41		-0,01	0,02	0,98	-0,15		-0,01	0,02	0,95	-0,11		-0,04	0,05	0,92	-0,08	5
6		-0,02	0,01	0,99	-0,69		-0,01	0,01	0,98	-0,38		-0,02	0,01	0,93	-0,40		-0,04	0,04	0,85	-0,45		-0,03	0,01	0,93	-0,56		-0,02	0,02	0,94	-0,45	6
1	BG	-0,03	0,33	-0,59	-0,72	EL	-0,12	0,43	-0,65	-0,76	IE	-0,23	0,39	-0,72	-0,88	NL	-0,23	0,66	-0,40	-0,87	SK	-0,07	0,35	-0,54	-0,70	CEEC	-0,10	0,41	-0,57	-0,80	1
2		-0,19	0,49	0,66	0,03		-0,09	0,45	0,76	0,30		-0,08	0,28	0,83	0,18		-0,06	0,23	0,86	0,18		-0,16	0,41	0,76	0,01		-0,16	0,39	0,74	0,07	2
3		-0,02	0,05	0,84	-0,03		-0,01	0,02	0,89	-0,05		-0,12	0,14	0,66	-0,25		-0,04	0,03	0,58	-0,31		-0,04	0,08	0,70	-0,12		-0,04	0,07	0,78	-0,06	3
4		-0,03	0,10	0,85	0,15		-0,03	0,07	0,93	0,09		-0,06	0,07	0,89	-0,20		-0,05	0,04	0,95	-0,10		-0,06	0,12	0,84	-0,06		-0,05	0,10	0,85	-0,01	4
5		-0,01	0,02	0,95	0,13		-0,01	0,02	0,96	-0,05		-0,07	0,09	0,87	-0,10		-0,02	0,02	0,97	-0,01		-0,01	0,01	0,97	0,03		-0,01	0,02	0,96	-0,04	5
6		-0,01	0,01	0,96	-0,57		-0,01	0,01	0,96	-0,07		-0,03	0,03	0,83	-0,35		-0,05	0,02	0,96	-0,64		-0,02	0,02	0,97	-0,67		-0,01	0,01	0,95	-0,51	6
1	CY	-0,07	0,32	-0,59	-0,84	ES	-0,08	0,35	-0,68	-0,74	IT	-0,07	0,42	-0,55	-0,75	PL	-0,05	0,45	-0,43	-0,85	UK	-0,20	0,51	-0,59	-0,90	SCAND	-0,20	0,59	-0,39	-0,93	1
2		-0,06	0,43	0,86	0,21		-0,09	0,41	0,81	0,19		-0,08	0,47	0,74	0,31		-0,08	0,41	0,75	0,29		-0,12	0,32	0,81	0,16		-0,17	0,20	0,87	-0,05	2
3		-0,04	0,11	0,67	-0,04		0,00	0,02	0,96	0,13		-0,02	0,02	0,84	-0,10		-0,04	0,04	0,85	-0,30		-0,07	0,07	0,74	-0,27		-0,08	0,07	0,65	-0,22	3
4		-0,04	0,07	0,93	-0,16		-0,03	0,12	0,91	0,12		-0,01	0,04	0,95	0,14		-0,06	0,08	0,88	-0,07		-0,03	0,04	0,93	-0,13		-0,05	0,08	0,88	0,01	4
5		0,01	0,05	0,97	0,50		-0,03	0,10	0,88	0,05		0,00	0,04	0,91	0,30		-0,01	0,02	0,96	-0,03		-0,01	0,01	0,98	-0,25		-0,07	0,05	0,89	-0,22	5
6		0,00	0,02	0,98	0,13		0,00	0,01	0,99	0,05		0,00	0,00	0,99	0,09		-0,01	0,01	0,96	-0,56		-0,08	0,06	0,88	-0,45		-0,03	0,01	0,95	-0,69	6
1	CZ	-0,19	0,37	-0,56	-0,86	FI	-0,20	0,57	-0,45	-0,93	LT	-0,09	0,37	-0,62	-0,81	PT	-0,08	0,36	-0,70	-0,72											1
2		-0,30	0,41	0,73	-0,17		-0,12	0,21	0,87	0,03		-0,19	0,43	0,71	0,04		-0,02	0,48	0,79	0,42											2
3		-0,05	0,06	0,84	-0,22		-0,07	0,08	0,69	-0,18		-0,01	0,06	0,90	0,18		-0,02	0,03	0,81	-0,13											3
4		-0,07	0,13	0,82	-0,01		-0,04	0,07	0,90	0,01		-0,04	0,11	0,83	0,06		-0,04	0,09	0,89	0,07											4
5		-0,01	0,01	0,96	-0,20		-0,07	0,06	0,88	-0,25		-0,01	0,01	0,96	-0,04		-0,02	0,04	0,94	0,06											5
6		-0,02	0,01	0,97	-0,73		-0,03	0,02	0,95	-0,68		-0,02	0,02	0,95	-0,47		-0,01	0,01	0,96	-0,39											6
1	DE	-0,11	0,50	-0,52	-0,72	FR	-0,09	0,42	-0,48	-0,84	LU	-0,12	0,45	-0,52	-0,81	RO	-0,09	0,35	-0,61	-0,78											1
2		-0,14	0,35	0,80	0,15		0,00	0,39	0,81	0,35		0,01	0,30	0,85	0,36		-0,06	0,52	0,72	0,38											2
3		-0,06	0,07	0,64	-0,09		-0,06	0,07	0,73	-0,27		-0,09	0,12	0,59	-0,15		-0,03	0,04	0,81	-0,09											3
4		-0,03	0,04	0,94	-0,04		-0,01	0,03	0,95	0,05		-0,04	0,07	0,93	0,02		-0,05	0,08	0,91	0,00											4
5		-0,04	0,04	0,93	-0,13		-0,03	0,05	0,91	0,04		-0,02	0,04	0,96	-0,01		0,00	0,00	0,99	0,05											5
6		-0,03	0,01	0,96	-0,58		-0,05	0,04	0,86	-0,53		-0,04	0,02	0,93	-0,61		-0,01	0,01	0,92	-0,58											6

Note: Expenditure items considered: 1 - Direct taxes; 2- Pensions; 3- Education, family, children; 4- Survivor, sickness and disability; 5- Unemployment benefits; 6- Social exclusion, housing.
Source: Author's calculations based on EU-SILC.

Table III.A2.3: **Regression analysis - sources and summary statistics**

Variable	Source	Unit	Obs	Mean	Std. Dev.	Min	Max
Inequality measures							
Gini disposable income	SWIID	index	185	27,7	4,5	17,3	37,1
Gini market income	SWIID	index	185	43,9	6,5	23,0	58,6
COFOG fiscal variables							
Education exp.	OECD COFOG	% GDP	114	4,4	0,9	2,6	6,1
Health exp.	OECD COFOG	% GDP	115	5,4	1,3	2,3	7,9
Other wages/interm cons. exp.	OECD COFOG	% GDP	105	9,1	1,3	6,0	11,9
Old-age and survivor pensions exp.	OECD COFOG	% GDP	133	8,5	2,9	3,1	16,6
Sickenss and disability exp.	OECD COFOG	% GDP	146	2,9	1,6	0,2	11,9
Unemployment benefits exp.	OECD COFOG	% GDP	136	1,4	1,3	0,0	8,0
Family and children exp.	OECD COFOG	% GDP	142	1,9	1,1	0,4	5,7
Subsidies exp.	OECD COFOG	% GDP	154	1,6	0,8	0,0	4,0
Investment exp.	OECD COFOG	% GDP	153	3,7	0,9	1,8	6,7
Other primary expenditure	OECD COFOG	% GDP	102	4,5	1,5	1,6	9,9
Property income paid exp.	OECD COFOG	% GDP	153	3,4	2,3	0,1	11,1
Main control variables							
Govt. headline balance	Ameco	% GDP	156	-3,2	3,1	-12,4	4,1
Real GDP per capita	IMF WEO	1,000 USD	171	27,9	17,7	3,4	104,9
Real GDP growth	Ameco	%	133	2,5	1,9	-4,9	10,1
Value added high-medium tech	OECD	% tot value-addec	97	3,2	1,7	0,3	7,8
Openness	Ameco	% GDP	179	48,8	29,9	14,5	187,5
Unemp. rate	Ameco	%	163	8,6	3,9	2,1	23,3
Part-time work	OECD	% tot. employed	143	14,4	10,2	1,8	60,6
Share pop > 65	Ameco	% tot. population	196	14,4	2,7	9,4	21,2
# school years	Barro and Lee (2016)	years	196	9,7	1,5	5,0	12,8
Govt. left	Comparative Political Data Set	cabinet posts of social democr. & other left parties in % of total cabinet posts	172	35,8	28,6	0,0	100,0

Note: The table shows summary statistics for the sample of 28 EU countries between 1980 and 2014 based on 5-year averages.
Source: Author's calculations.

Table III.A2.4: **Regression analysis - correlation matrix**

	Inequality measures		*COFOG fiscal variables*											*Main control variables*									
	Gini disposable income	Gini market income	Education exp.	Health exp.	Other wages/interm cons.	Old-age/survivor pensions	Sickenss and disability	Unemployment benefits	Family and children exp.	Subsidies exp.	Investment exp.	Other primary exp.	Property income paid exp.	Govt. headline balance	Real GDP per capita	Real GDP growth	VA high-medium tech	Openness	Unemp. rate	Part-time work	Share pop > 65	# school years	Govt. left
Gini disposable income	1																						
Gini market income	0,69	1																					
Education exp.	-0,15	0,07	1																				
Health exp.	-0,30	0,10	0,14	1																			
Other wages/interm cons. exp.	-0,26	-0,11	0,35	-0,11	1																		
Old-age/survivor pensions exp.	0,07	-0,07	-0,07	0,25	-0,05	1																	
Sickenss and disability exp.	-0,40	-0,09	0,24	0,37	0,30	-0,31	1																
Unemployment benefits exp.	-0,23	-0,04	0,21	0,40	-0,05	-0,09	0,57	1															
Family and children exp.	-0,61	-0,33	0,40	0,33	0,14	-0,09	0,39	0,46	1														
Subsidies exp.	-0,61	-0,43	0,09	0,22	0,13	0,05	0,21	0,17	0,38	1													
Investment exp.	-0,19	-0,31	0,06	-0,18	0,16	-0,15	0,12	-0,34	0,07	0,23	1												
Other primary expenditure	-0,27	0,27	-0,01	0,29	0,07	0,06	0,16	0,18	0,38	0,17	-0,29	1											
Property income paid exp.	0,00	0,07	0,07	0,13	0,07	0,16	0,06	0,44	-0,08	0,14	-0,25	0,11	1										
Govt. headline balance	-0,30	-0,30	0,08	-0,11	-0,10	-0,21	0,07	-0,06	0,35	-0,03	0,15	-0,27	-0,55	1									
Real GDP per capita	-0,54	-0,10	0,01	0,36	-0,27	0,11	0,09	0,21	0,43	0,06	-0,15	0,31	-0,04	0,33	1								
Real GDP growth	0,30	-0,11	-0,05	-0,55	-0,22	-0,37	-0,10	-0,17	-0,12	-0,09	0,05	-0,29	-0,19	0,319	-0,39	1							
Value added high-medium tech	-0,01	-0,16	-0,15	0,22	0,11	0,13	0,13	0,00	-0,16	0,31	-0,14	0,03	0,13	-0,06	-0,36	0,02	1						
Openness	-0,14	0,10	-0,03	-0,12	-0,19	-0,18	-0,15	-0,19	0,03	-0,04	-0,09	-0,05	-0,18	0,16	0,36	0,14	-0,19	1					
Unemp. rate	0,34	0,37	-0,01	-0,09	0,12	0,06	-0,14	0,02	-0,40	-0,27	-0,27	-0,10	0,20	-0,46	-0,31	-0,13	-0,07	-0,10	1				
Part-time work	-0,12	0,01	0,01	0,38	-0,10	-0,09	0,33	0,24	0,13	-0,04	-0,37	0,14	0,03	0,15	0,57	-0,26	-0,24	0,07	-0,27	1			
Share pop > 65	-0,66	-0,14	0,10	0,33	0,10	0,39	-0,13	-0,16	0,02	-0,18	-0,07	-0,08	0,02	-0,03	0,62	-0,46	0,10	-0,10	0,20	0,06	1		
# school years	-0,48	-0,10	-0,15	0,11	0,05	-0,28	0,02	-0,32	0,01	-0,19	-0,14	0,25	-0,14	-0,05	0,56	-0,29	0,14	0,37	0,27	0,19	0,70	1	
Govt. left	-0,15	-0,05	0,06	0,11	0,10	0,11	0,12	0,02	0,24	-0,01	0,16	0,19	0,00	0,02	0,02	-0,02	-0,01	-0,13	-0,06	-0,03	0,12	-0,09	1

Note: The table shows the correlation matrix for the sample of 28 EU countries since 1980 based on 5-year averages.
Source: Author's calculations.

Table III.A2.5: **Regression findings - sensitivity analyses for fiscal variables**

	(1) Sys GMM	(2) Sys GMM	(3) Sys GMM	(4) Sys GMM	(5) Sys GMM	(6) Sys GMM	(7) Sys GMM	(8) Sys GMM	(9) Sys GMM
Control variables									
ln gini	t-1	t-1	t-1	t-1	t-1	t-1	t-1	t-1	t-1
ln gini market income	t	t	t	t	t	t	t	t	t
ln real GDP pc	t-1	t-1	t-1	t-1	t-1	t-1	t-1	t-1	t-1
ln govt. headline balance	t-1	t-1	t-1	t-1	t-1	t-1	t	t	t
ln unemp. rate	t-1	t-1	t-1	t-1	t-1	t-1	t	t	t
ln openness	-	t-1	t-1	t-1	t-1	t-1	t-1	t-1	t-1
ln share pop > 65	-	-	t-1	t-1	t-1	t-1	t-1	t-1	t-1
ln # school years	-	-	-	t-1	t-1	t-1	t	t	t
ln govt. left	-	-	-	-	t-1	t-1	-	t	t
ln personal inc. tax revenues (t-1)	-	-	-	-	-	t-1	-	-	t
The following fiscal expenditure items are included one-by-one controlling for the variables listed above									
	variables are lagged						***variables are not lagged***		
ln education exp.	-0.056	-0.053	-0.116**	-0.115***	-0.115***	-0.064*	-0.131**	-0.099**	-0.089**
	(-1.282)	(-0.970)	(-2.544)	(-2.631)	(-2.886)	(-1.957)	(-2.397)	(-2.377)	(-1.985)
ln health exp.	-0.062*	-0.054*	-0.021	-0.004	-0.029	-0.101**	-0.078*	-0.077*	-0.116**
	(-1.696)	(-1.728)	(-0.577)	(-0.100)	(-0.793)	(-2.527)	(-1.700)	(-1.700)	(-2.501)
ln other wages/interm cons. exp.	-0.082	-0.063	-0.103	-0.078	-0.072	-0.057	-0,15	-0.028	-0.082
	(-0.570)	(-0.708)	(-1.024)	(-0.992)	(-0.744)	(-0.950)	(-1.468)	(-0.279)	(-0.985)
ln old-age & survivor pensions exp.	0.069	0.014	0.085	0.067	0.052	0.066	0.018	0.056	-0.008
	(1.021)	(0.484)	(1.165)	(1.561)	(1.054)	(1.181)	(0.558)	(0.884)	(-0.302)
ln sickness and disability exp.	-0.044**	-0.036***	-0.028*	-0.036**	-0.031**	-0.043**	-0.051***	-0.054***	-0.061*
	(-2.519)	(-2.581)	(-1.938)	(-2.368)	(-2.269)	(-2.539)	(-2.830)	(-3.082)	(-1.886)
ln unemployment benefits exp.	-0.003	-0.015	-0.025	-0.011	-0.011	-0.012	-0.024	-0.030	-0.022
	(-0.189)	(-1.216)	(-1.431)	(-0.867)	(-1.101)	(-1.379)	(-1.505)	(-1.604)	(-1.235)
ln family and children exp.	-0.021	-0.034*	-0.041**	-0.044*	-0.049**	-0.048**	-0.076**	-0.050	-0.052***
	(-0.685)	(-1.813)	(-2.130)	(-1.890)	(-2.414)	(-2.224)	(-2.462)	(-1.263)	(-2.934)
ln subsidies exp.	-0.013	-0.013	-0.029	-0.009	-0.027	-0.024	-0.023	-0.023	-0.029
	(-0.525)	(-0.526)	(-0.766)	(-0.286)	(-0.926)	(-1.462)	(-0.738)	(-0.884)	(-1.630)
ln investment exp.	-0.014	-0.008	-0.026	-0.026	-0.021	-0.009	-0.020	0.001	0.017
	(-0.332)	(-0.181)	(-0.797)	(-0.743)	(-0.574)	(-0.316)	(-0.452)	(0.018)	(1.156)
ln other primary exp.	-0.056	-0.072*	-0.034	-0.033	-0.045	-0.052	-0.047	-0.029	-0.013
	(-1.585)	(-1.811)	(-0.935)	(-0.911)	(-1.074)	(-1.583)	(-1.075)	(-0.825)	(-0.432)
ln property income paid exp.	0.016	0.022	0.014	0.015	0.010	0.014	-0.017	-0.006	0.005
	(0.901)	(0.855)	(0.575)	(0.643)	(0.408)	(0.750)	(-0.748)	(-0.204)	(1.610)

Note: The table shows robustness test for the impact of fiscal policy items on the Gini index of disposable income. The specifications test the robustness of the fiscal expenditure items by using different types of baseline regressions, which are listed in the upper panel of this table. To avoid multicollinearity, the fiscal sub-components are not included altogether, but added one-by-one to the specification. For more details on the estimation approach used see note of Table 4. ***, ** and * denote respectively statistical significance at 1, 5 and 10%.
Source: Author's calculations.

ANNEX 3
Supplement to Chapter III.4.

A3.1. BACKGROUND INFORMATION ON THE MICROSIMULATION MODEL EUROMOD

EUROMOD is the microsimulation model for the European Union. It encodes the tax and benefit systems of all Member States in a harmonised way and calculates income taxes, social contributions, cash benefits, and disposable income for individuals and households in the underlying input data, which are derived from the European Statistics on Income and Living Conditions (EU-SILC). As EU-SILC data are based on a survey and therefore published with a certain time lag, monetary values are brought in line with the policy year of interest by applying uprating factors as the consumer price index and statutory adjustment rules (e.g., for pensions and social benefits). EUROMOD allows assessing the budgetary, distributional, and equity impact of a country's tax and benefit system as well as actual or hypothetical reforms thereof. ([152])

Microsimulation models are useful tools to analyse the impacts of tax and social benefits reforms on inequality for a variety of reasons:

- First, the use of micro-data allows for a precise estimate of the distributive impacts of policy reforms. Microsimulation models can be eventually combined with micro-labour supply models to investigate the behavioural reactions to tax policy changes (see in particular Bargain et al. (2014)).

- Second, taxes and social benefits policies are often closely interconnected, and the use of micro simulations aims at considering those interactions. For instance a reduction in personal income tax rates affecting low tax brackets could be automatically compensated by a reduction in some social benefits (such as for instance child benefits) if these were calculated with reference to after-tax income. These aspects are often over-looked in purely macroeconomic models, although they might have non-negligible impacts on certain categories of households. In the same vein, some tax expenditures (i.e. tax credit and tax allowances affecting the tax rate and bases) might be refundable, i.e., leading to a direct cash transfer by the government. This is for instance sometimes the case for mortgage interest tax rebates, family-related deductions or in-work benefits, which can have non negligible impact on income inequality (see in particular Barrios et al. (2016)). The existence of tax expenditures and social benefits linked to taxes implies that any change in tax policy might trigger interactions within the entire tax and benefit systems.

The approach proposed by Bargain and Callan (2010) provides a decomposition framework to isolate the impact of policy changes from changes in market incomes and population characteristics using the EUROMOD microsimulation model. Importantly the use of EUROMOD ensures that this approach is applied consistently across European countries allowing cross-country analysis. Following this approach, the actual distribution of household disposable incomes in a given year is compared with a counterfactual scenario of income distribution assuming that the policies of the initial period are still in place, while keeping population characteristics and market incomes constant. To build the counterfactual scenario for the evolution of market incomes, one can alternatively use average market income or consumption prices to index tax brackets and benefits amounts, although both options have pros and cons.

A3.2. ADDITIONAL COEFFICIENTS FOR AUTOMATIC STABILISATION OF INCOME AND DEMAND FROM A MICROECONOMIC PERSPECTIVE

As indicated in the main text, we also calculated the income and demand stabilisation coefficients based on the country and individual level. This Section provides more information on the computation.

([152]) An extensive introduction to EUROMOD is provided by Figari and Sutherland (2013), which can be accessed via the EUROMOD homepage (https://www.euromod.ac.uk/).

Income stabilisation coefficients

Income stabilisation coefficient at the country level (τ_c)

The indicator is computed as the difference between the aggregated country-level variations in household resources in absence and in presence of a tax and benefit system, expressed as a share of the aggregated change in market income (methodology in line with Dolls et al., 2012). It provides a single coefficient per country:

$$\tau_c = 1 - \frac{\sum_i \Delta Y_i^D}{\sum_i \Delta Y_i^M}$$

A key drawback of the country-level ISC is that it misses the distributional dimension of automatic stabilisation. In the expression above both changes in disposable (ΔY_i^D) and in market incomes (ΔY_i^M) are aggregated at the national level so that the τ_c indicator misses the distributional dimension of automatic stabilisation. Since households' circumstances differ, they will also experience different degrees of automatic stabilisation provided by the tax and social benefits systems. Two modifications of the τ_c index hence consist of a household and individual-specific extension.

Income stabilisation coefficient at the individual level ISC $(\boldsymbol{\tau_i})$

This indicator computes the cushioning effect of the tax and benefit system on household disposable income if household members were to experience the shock one at the time (methodology in line with Jara and Tumino, 2013). Adopting an iterative approach, market income is modified for one person at a time keeping constant the resources of the other household members. Household disposable income is hence re-computed at each iteration. The next equation describes the calculation of this alternative measure:

$$\tau_i = 1 - \frac{\Delta Y_{h,i}^D}{\Delta Y_{h,i}^M}$$

Where $\Delta Y_{h,i}^M$ measures the change in the income of individual *i* in household *h* and $\Delta Y_{h,i}^D$ measures the change in the household disposable income when only the market income of the individual *i* is modified. τ_i, differs from τ_h because in the latter the market incomes of all the household members are modified at once, while in τ_i incomes are modified individual by individual and changes in household disposable income are computed at each iteration. Similar to τ_h, it is possible to derive an empirical distribution of τ_i.

Demand stabilisation coefficients

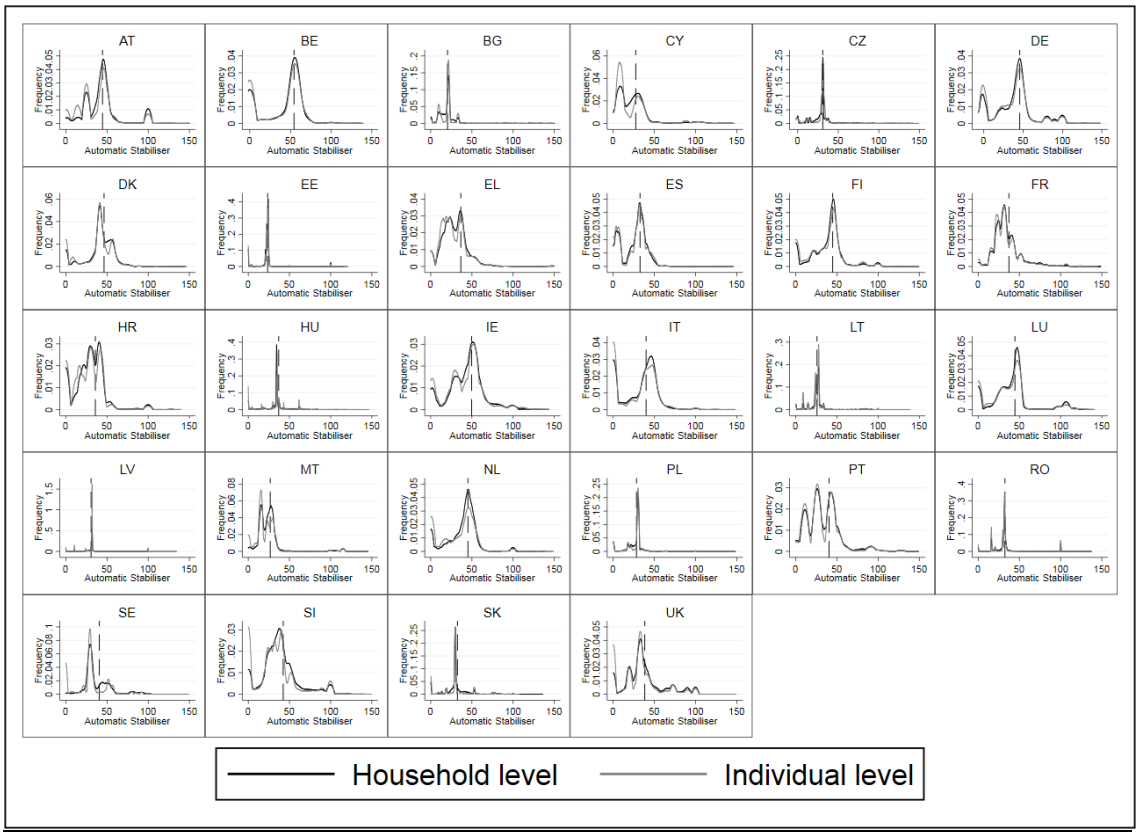
Similar to the income stabilisation indicators, it is possible to compute three demand stabilisation indicators which are summarised by the formulas below:

$$\theta_c = 1 - \frac{\sum_i (\alpha_h * \Delta Y_i^D)}{\sum_i \Delta Y_i^M}$$

$$\theta_i = 1 - \frac{\alpha_h * \Delta Y_{h,i}^D}{\Delta Y_{h,i}^M}$$

where θ_h and θ_i the demand stabilisation coefficients at the household and at the individual level respectively. α_h stands for the marginal propensity to consume of individuals belonging to household h. ([153])

Graph III.A3.1: **Kernel densities**



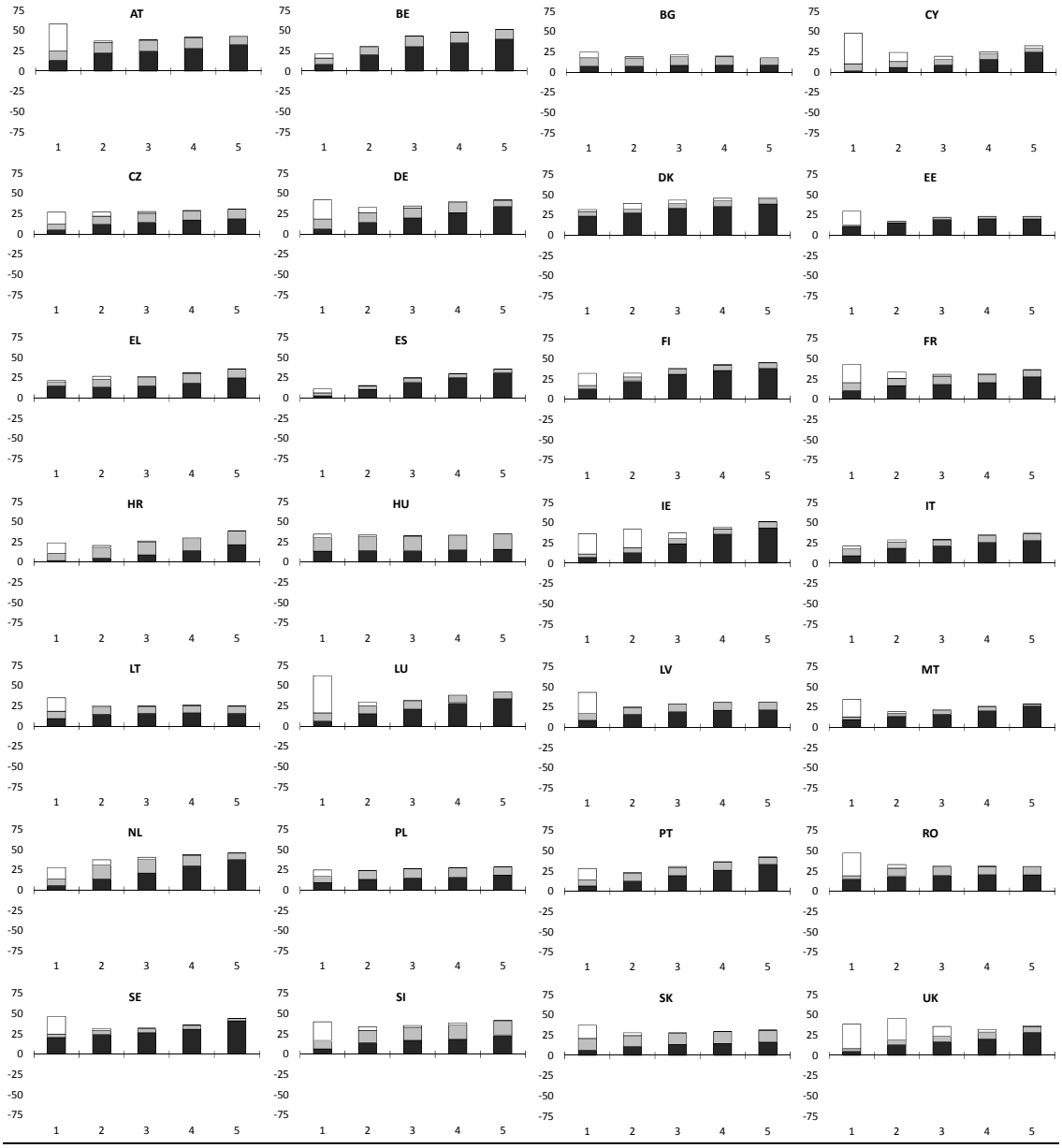
Source: Author's calculations based on EU-SILC.

([153]) Note that the interpretation of the demand stabilisation coefficient used here differs from the one used in an influential academic paper (Dolls et al., 2012), where the demand stabilisation coefficient is computed according to the formula:

$$\theta^{DFP} = \frac{\sum_i(\alpha_h * \Delta Y_i^M) - \sum_i(\alpha_h * \Delta Y_i^D)}{\sum_i \Delta Y_i^M}$$

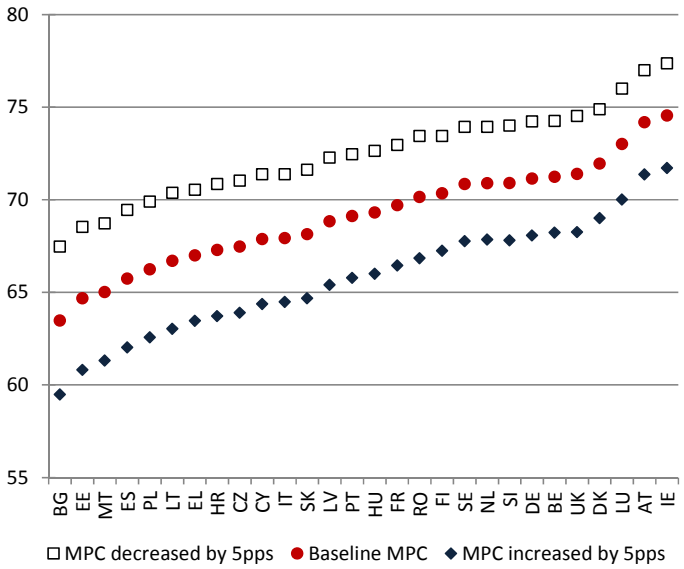
θ^{DFP} and θ_c measure different concepts of stabilisation. While θ_c informs on the share of an income shock which is (not) reflected in changes in the demand, θ^{DFP} identify the role plaid by automatic stabilisers alone by comparing variation in household demand in absence and in presence of automatic stabilisation.

Graph III.A3.2: **Income stabilisation by quintile**



Source: Author's calculations based on EU-SILC.

Graph III.A3.3: **Demand stabilisation, sensitivity analysis**



Note: The graph reports a sensitivity analysis of the demand stabilisation, consisting in increasing/decreasing the marginal propensity to consume (MPC) by 5pps relative to each quintile of disposable income. The graph shows that increasing MPC leads to a reduction in demand stabilisation as intuitively demand will be more responsive to income shocks. Additionally, the graph confirms the importance of correctly assessing the MPC, as modifications in its values significantly affect the demand stabilisation coefficients.
Source: Author's calculations.

Part IV

Government investment in the EU: the role of institutional factors

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KEY FINDINGS

Short-term budgetary pressures during the crisis may have led to myopic policymaking, in which governments slashed public investment in order to achieve savings. This policy impacted all levels of national governance as half of public investment is carried out by sub-national authorities (regions and municipalities). In this context, this part of the report analyses the main drivers of public investment with a focus on institutional factors and the sub-national level.

Public investment is driven by economic, fiscal, political-economy and institutional factors.

- A survey of the economic literature on the determinants of government investments shows that three broad type of factors influence government investment:
- (i) economic factors: countries with higher GDP or more developed countries have higher desire for public investments and tend to invest more, often in a pro-cyclical manner. The same holds for countries with younger populations, where a higher value is attributed to future output;
- (ii) fiscal policy factors: high levels of public debt or deficit seems to weigh on public investment, as constraints from the markets on financing of governments make it more difficult to find resources;
- (iii) political-economy factors: governments tend to invest more around election times.
- In addition, institutional factors, in particular an efficient and transparent management of public investment projects are key to ensuring value for money. Progress in this respect can be made in the EU according to several institutional studies and surveys.

Institutional quality matters for the provision of public investment.

- The report provides new empirical evidence confirming previous findings that public investment is hampered by higher levels of public debt. Our estimates show that a 1% increase in the debt-to-GDP ratio is followed by a decrease of the investment-to-GDP ratio of close to 0.1%.
- However, for a given level of public debt, this negative effect is smaller for Member States with a better quality of governance and/or stronger national fiscal rules. Depending on the institutional features of the country, a 1% increase in the debt-to-GDP ratio can be followed by a decrease in the investment-to-GDP ratio ranging from -0.2 % to no decrease in the short run and from -0.5% to -0.1% in the long run.

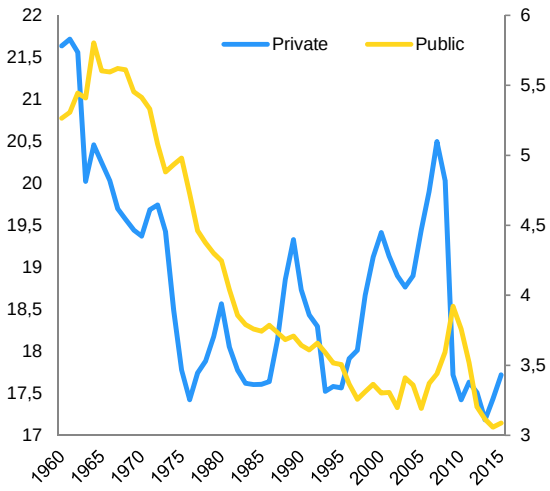
Practical issues for public investment are exemplified in five case studies on selected EU Member States.

- Confirming previous institutional studies and surveys on public investment management, these examples show that there is room to improve the management of public investment in all selected countries.
- The investment process can be decomposed in four main steps: (i) planning, when a strategy is defined and projects are selected; (ii) financing, when the resources to conduct the projects are found and allocated; (iii) implementation, when the actual work is carried out and monitored; and (iv) evaluation, when the outcome and process of the previous phases is critically assessed.
- Various challenges are identified throughout these steps and are in particular related to the coordination and financing across levels of government, the project implementation through more rigorous procurement procedure, and the administrative capacities needed to ensure proper quality control.

1. INTRODUCTION

Investment remains at the top of the economic policy agenda in the EU. ([154]) This policy priority aims at tackling the record low investment in Europe since the crisis (Graph IV.1.1). To this end the investment plan for Europe, fostering both public and private investment, has been prolonged to 2020 with an increased financial capacity. In addition, EU Structural and Investment Funds play a prominent role in supporting public investment. ([155]) However, while private investments started rebounding, public investments still remain well below pre-crisis levels.

Graph IV.1.1: **Investment trend in the EU (per cent of GDP)**

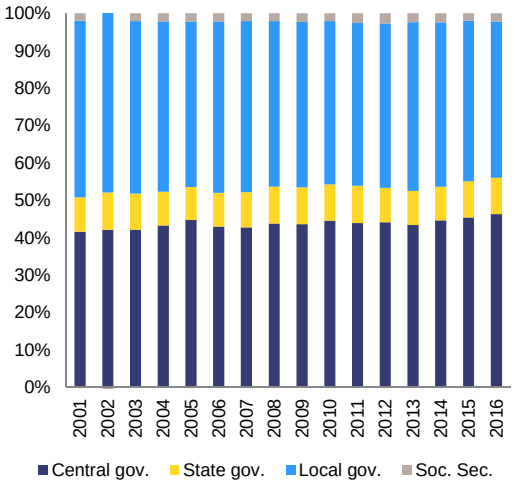


Source: International Monetary Fund, author's calculations.

Sub-national authorities are key to the provision of public investment. Since 2001, in the EU, sub-national government represents slightly more than half of total public investment (Graph IV.1.2).

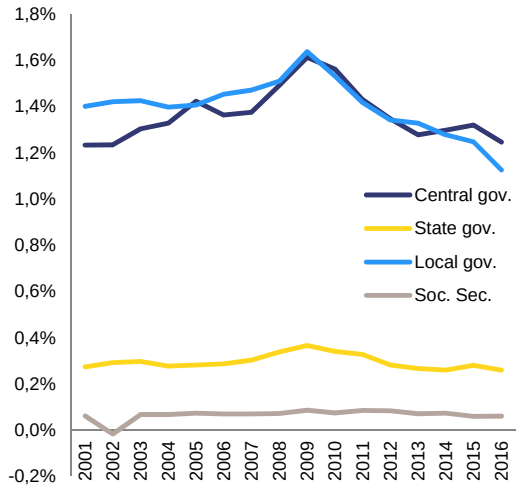
Both central and sub-national authorities cut their investment during the crisis. Their investment decreased from 1.6% of GDP before the crisis to 1.0-1.1% of GDP in 2016 (Graph IV.1.3).

Graph IV.1.2: **Share of public investment by subsector in the EU**



Note: State government is the federated state level where applicable, local government combines regional and municipal authorities.
Source: Eurostat.

Graph IV.1.3: **Public investment by subsector in the EU as a share of GDP**



Note: State government is the federated state level where applicable, local government combines regional and municipal authorities.
Source: Eurostat.

The decline in public investment, although made more salient by the crisis, is not a recent phenomenon (Graph IV.1.1). This topic was

([154]) See for instance the recommendations for economic policy in the Euro Area https://ec.europa.eu/info/sites/info/files/2017-european-semester-recommendation-euro-area_en_0.pdf or the AGS 2017 http://data.consilium.europa.eu/doc/document/ST-14357-2016-INIT/en/pdf

([155]) Box III.2.1 of the previous edition of this report. European Commission (2016a).

discussed in last year's edition of the Report on Public Finances in EMU. ([156]) An investigation of the determinant of public investment will help further understand the elements behind the decline in public investment.

The Commission has identified barriers affecting public investments. As part of the European Semester, particular emphasis has been placed on the identification of investment barriers in EU Member States and the priority reforms to remove them. ([157]) This identification is based on country-specific profiles on investment challenges at national level in 2015, ([158]) complemented by further information provided in the country reports published every year. While the highest number of barriers to investment in Member States is related to weaknesses in the business environment, therefore affecting first private investment, ([159]) in some countries, some barriers affect more directly public investment, such as a lack of administrative capacity or a lack of transparency in planning/coordination or *ex post* assessments, as well as in the implementation of public procurement and public private partnerships. There are also a number of bottlenecks linked to cumbersome and lengthy approval procedures in particular for large infrastructure projects in energy, transport, and broadband.

While there are many factors affecting public investment, improving the management of public investment appears relevant in the EU context. Advanced economies (a category which includes most EU countries) could benefit from improved financial planning to secure plurennial budgets and a better coordination across levels of government. Emerging market (a category including some of new EU Member States – HU, HR, RO, PL, BG) would benefit from more rigorous and transparent procedures both before and during the implementation phase. ([160])

This is especially true at the regional level. Sub-national authorities report investment challenges across the board. ([161]) Some challenges appear more prominent, such as the different dimensions of coordination (across levels of government, neighbouring sub-national authorities, sectors…), administrative burden (compared to sub-national authorities' capacity), the lack of long term strategy, weaknesses in the *ex post* and *ex ante* assessment, but also co-financing requirements from the central government or the EU. ([162])

This part of the Report examines the general drivers of public investment and of its efficiency and then focuses on the role of sub-national authorities. It is organised as follows. Chapter IV.2. reviews the literature on the determinants of public investment and its efficiency with a special focus on sub-national investments. It not only surveys the academic literature, but also presents the complementary recommendations for a sound investment management and governance developed by international institutions, which are key to enhancing the efficiency of public investment. Chapter IV.3. provides a novel econometric analysis on the determinant of public investment, using a macro panel. It also takes into account the quality of investment governance and the fiscal rules. This analysis complements the review of the literature, but both remain of horizontal nature. Therefore, there is also a need to analyse country-specific features, in particular regarding relevant governance aspects. Chapter IV.4. presents five country case studies, illustrating the role of institutional factors and nuancing at times the horizontal recommendations. Four boxes provide specific highlights on the share of intangible assets in the definition of public investment, on the interaction between public and private investment, on the measure of governance quality and on the identification of public investment gaps in the EU.

([156]) European Commission (2016a).
([157]) See in particular the third pillar of the EFSI.
([158]) European Commission (2015b).
([159]) Examples are a high regulatory burden, the lack of a predictable regulatory framework, or the complexity of the tax system.
([160]) IMF (2015).
([161]) See a joint survey of the OECD with the Committee of Regions OECD-CoR (2015), see also OECD (2013), Chapter 2 for a similar approach.
([162]) See also the Irish case in Sub-section IV.4.2.4.

2. INSIGHTS FROM A SHORT REVIEW OF THE ACADEMIC AND POLICY LITERATURE

The literature has identified several sets of factors influencing public investment of the general government. ([163]) Economic and financial factors affect public investment both within the cycle and in the long run. Beyond the general economic conditions, the conditions of fiscal policy are also a key determinant of public investment. A third set of factors is related to the political economy (election cycle…).

Two dimensions of public investment are worth a closer look: first, the crucial role of sub-national authorities, reflecting the distribution of responsibilities across levels of governments; second, the need to improve quality or efficiency of the investment process.

2.1. THE ECONOMIC DRIVERS OF PUBLIC INVESTMENT

The macroeconomic developments can have a sizeable impact on public investment. This finding holds both for cyclical developments in GDP and structural long-term developments. ([164]) Evidence suggests that public investment is pro-cyclical, i.e. typically boosted in periods of high growth and depressed during episodes of recession. ([165])

Government investment can be influenced by the level of capital stock or by past government investment. Public investment is characterised by diminishing returns to scale. This implies that a high initial level of capital stock or past cumulated investment is expected to negatively affect new investments. ([166]) On the contrary, a positive dependency of investment with its own past can simply reflect a time-to-build effect. ([167])

The relation between private investment and government investment is complex. It is often heard that public investments diminished because they have been substituted for by private ones. ([168]) In reality, private and government investments are also found to be complements rather than substitutes. ([169])

Measurement difficulties are sometimes invoked to explain the downward trend in public investment. The first argument is related to the difficulty to define its boundaries, with the emergence of contracts such as Public Private Partnerships and of private investors substituting public investors. However, the data show that PPP remains marginal in public investment. Therefore, this is not the primary cause of public investment deterioration. ([170]) Another argument is related to the development of intangible assets, some of which may not be properly accounted for. ([171])

Financial innovations may weigh on the investment trends. Since the eighties, the development of financial instruments for hedging risk may have allowed for the private sector to pursue riskier projects. This mechanism could have favoured the replacement of the government by the private sector in the realization of risky long-term projects. ([172])

Globalisation may also affect government investments. Globalisation, as measured by the inflow of foreign direct investment (FDI) negatively affects public investment. ([173]) This result can be explained by the fiscal competition to attract private investors which takes place through lower taxes rather than better infrastructures. On the contrary, trade is positively associated to public investment. This increase of investment

([163]) See Annex IV.3 for a tabular presentation of the econometric studies since the nineties. Previous studies were country based and can be found in de Haan et al. (1996).
([164]) This is either measured by real GDP growth, output gap, unemployment rate or inflation rate. Structural changes in the economy are instead captured by the real GDP per capita.
([165]) Mehrotra and Välilä (2006), Turrini (2004), Kappeler and Välilä (2008). However, Heinemann (2006) finds that the pro-cyclicality of public investment is not very robust.
([166]) Heineman (2006) for the effect of capital stock, while Keman (2010) considers past investment in the context of political majority changes.
([167]) See for instance Kappeler and Välilä (2008) or Chapter IV.3 highlight this progressive change effect.
([168]) According to Sturm (2001) while crowding out seems to characterize contemporaneous private and public capital, a complementarity is found when considering lagged private investment.
([169]) de Haan et al. (1996), see also Box IV.2.2.
([170]) See also Heinemann (2006) and European Commission (2016a).
([171]) See Box IV.2.1.
([172]) Turrini (2004).
([173]) Heinemann (2006).

accompanying the openness of the economies is interpreted as a social insurance that governments put in place in economies which are more exposed to external shocks. ([174])

Demography can play a role in public investment decisions. ([175]) A growing population implies larger demand of investment although empirically this result is not really robust. Still, the composition of the population matters. The share of elderly voters is found negatively correlated with public investment rates. This can be explained by the fact that elderly people, discounting more future payoffs, tend to favour current expenditure to investment. Similarly, the fertility rate has a positive relationship with investment, as the return to public investment can be expected to be high for the new generations. ([176])

2.2. THE FISCAL DRIVERS OF PUBLIC INVESTMENT

The recent crisis exemplified the sensitivity of public investment to fiscal conditions. The first reaction to the global slowdown was counter-cyclical. Governments supported activity through among other measures– a series of public investment programmes equivalent to 0.7% of GDP in 2009 in OECD countries. ([177]) This fiscal stimulus rapidly switched to fiscal consolidation, which affected public investment. ([178]) This is a well-known pattern of consolidations. 25 out of 32 lasting and significant budget consolidation episodes, which took place in the EU-15 between 1980 and 1997 were mostly obtained through investment cuts. ([179])

Fiscal sustainability matters. Public debt is consistently found to hamper investment. ([180]) Moreover, perceived risks to debt sustainability restrict the ability of the government to finance new investment, and certainly matter in explaining the investment decline, especially for EU high-debt countries. ([181]) For countries with low debt, efforts to rein in budget deficits have negative impact on public investment. ([182]) However, the borrowing cost does not appear to be determinant for public investment decisions. ([183]) The impact of sustainability variables mentioned above is similar for EU and OECD countries. This suggests that there is no clear and general relationship between the existence of EU fiscal rules and investment developments. ([184]) As discussed in Section IV.2.5, along with fiscal sustainability, the design of rules for budget approval also matters, in particular the possibility of having multi-annual budgets can lock in necessary funds for the medium term.

2.3. THE POLITICAL ECONOMY DRIVERS OF PUBLIC INVESTMENT

The role of political factors remains unclear. Some authors find a negative relation between leftist governments and public investment ratio ([185]) while others do not find any role for the ideological orientation of the government on investment. ([186]) If in the '70s leftist parties typically invoked a larger role for government and so more investment also in relation to social equality reasons, during the '80s and '90s this trend is counterbalanced by the ideological change towards less state intervention in the economy. This trend is more pronounced if leftist governments were in office, for longer periods, before the eighties. ([187])

([174]) Rodrik (1998).
([175]) Jäger and Schmidt (2016).
([176]) Heinemann (2006).
([177]) See European Commission (2016) and OECD (2011) for details.
([178]) Vammalle and Hulbert (2013) Fiscal consolidation plans targeted investment in Austria, Czech Republic, Greece, Ireland, Luxembourg, Portugal, Slovak Republic, Slovenia, Spain, Sweden, and the UK, see also the Spanish country case Sub-section IV.4.2.2.
([179]) Balassone and Franco (2000). See also European Commission (2014b). On the contrary, Stančík and Välilä (2012) find that fiscal tightening boosts the investment-consumption ratio.
([180]) See also Chapter IV.3 of this report.
([181]) Galí and Perotti (2003); Bacchiocchi, et al. (2011); Mehrotra and Välilä (2006).
([182]) Bacchiocchi, et al. (2011).
([183]) Mehrotra and Välilä (2006); Heinemann (2006).
([184]) Galí and Perotti (2003); Bacchiocchi et al. (2011) and Mehrotra and Välilä (2006). Fiscal rules and more generally financial arrangements across levels of governments are of particular relevance in the relationship between sub-national and central governments, see Section IV.2.4. The interaction of national fiscal rules with debt levels is further investigated in Chapter IV.3.
([185]) Rodrik (1998), Keman (2010), Van Dalen and Swank (1996).
([186]) Heinemann (2006), see also Chapter IV.3.
([187]) Keman (2010), see also Sub-section IV.4.2.5, regardless of the parties, political considerations seem to interfere with investment projects in Romania.

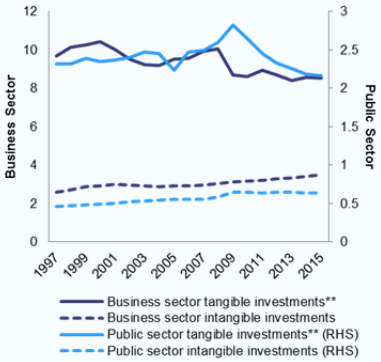
Box IV.2.1: Public sector investments in intangible assets – facts and figures

Investments come in different forms which can differ in dimension and dynamics. Official national accounts broadly distinguish between gross fixed capital formation in tangible assets and intellectual property products, i.e. intangible assets. Tangible investments essentially include machinery and equipment (including, in the case of government, weapons systems), dwellings and other buildings and structures (e.g. roads, bridges, airfields, pipelines) and cultivated biological resources. Intangible assets comprise spending on R&D, mineral exploration, computer software and databases, and entertainment and literary originals.[1]

In many countries, investment data by asset category are not available for the general government sector (or the corporation sector). However, using more widely available investment data by industry and grouping public administration and defence, compulsory social security, education, human health and social work activities into a "public" and "business" sector does allow for some approximation of a sector specific distribution by asset type.

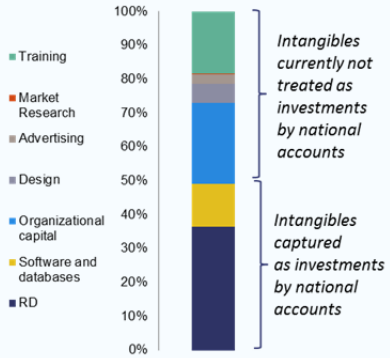
Graph IV.2.a depicts tangible and intangible GFCF in the public sector and compares them to the business sector. According to this, intangible investments make on average for a low but steadily growing share, both in relation to overall value added and total investment. Investments in tangible investments, on the other hand, have been declining in relative terms, although they still command the highest share in absolute terms. ([2])

Graph IV.2.a: **Investment trends per asset type in the EU* – business vs. public sector (% of total GVA excluding real estate activities)**



Note: Public sector defined as NACE Rev. 2 activities O, P, Q; business sector covers activities A to N, except L, plus R and S.
* EU average is based on 23 EU countries (BG, CY, HR, LT, RO not available).
** Excluding investments in dwellings.
Source: Authors' calculations based on Eurostat national accounts.

Graph IV.2.b: **Public sector investments in intangibles by asset type - share in % of total investment in intangibles according to SPINTAN data – EU average consisting of 22 Member States**



Source: Authors' calculations based on SPINTAN data (www.spintan.net).

The increased quantitative relevance of intangible investment and conceptual considerations on their impact on productivity, growth and living standards have led some researchers to call for an expansion beyond the current scope of intangibles in National Accounts. For example, research

([1]) The inclusion of intangibles such as R&D, computer software and databases in asset classifications was part of the last revision of the system of national accounts.
([2]) For a deeper and mainly business sector oriented analysis of intangible investments in the EU, see European Commission (2017b).

(Continued on the next page)

Box (continued)

conducted in the context of INTAN-Invest and SPINTAN ([3]) propose to also consider the spending on organizational capital, training, designs and brands and, specifically to the public sector, open data and cultural and heritage assets formally as investments. Academic estimates from these projects suggest that the share of public sector intangible investments presently recorded in national accounts could, on average, roughly double in size if following such a definition (Graph IV.2.b). ([4])

([3]) These are two EU-funded projects on measuring intangible assets in the business and public sector, see www.intan-invest.net and www.spintan.net.

([4]) Note, however, that extending the national accounts asset boundary for additional intangible assets and eventually producing official and internationally harmonised data of high quality would depend on solving a range of significant existing conceptual and measurement challenges, e.g. related to the correct definition and valuation of such assets, identifying appropriate price deflators and measuring their depreciation.

Political systems characterised by long mandates have higher investment ratios, especially in crisis periods. Cuts in investment ([188]) are enacted more often by myopic ([189]) governments than by governments with longer policy horizon. Myopic policymakers try to avoid voters' frustration, and refrain from cutting government consumption or, restore it in view of re-elections, to the detriment of investment. Still, the role of the electoral cycle is undetermined. Only few authors ([190]) find significant results confirming the idea of an upward drift affecting public investment, as well as other government expenditure categories, around election times. The role of government typology (coalition, majority government or minority government) is also uncertain. While theoretically politically weak governments are expected to be more subject to lobbying activities and so more inclined to cut capital formation spending than politically strong governments, only few empirical studies confirm the expectations. ([191])

Corruption implies higher public investment spending. This finding is explained by the so-called rent-seeking behaviour, namely that corrupt governments increase investment spending in order to cash-in ransoms. ([192]) However, this leads to a higher volatility of investment. ([193]) Indeed, good governance would entail more careful planning and therefore a stable outflow of projects, and possibly a higher quality of public capital. This corruption effect also implies that fighting corruption may be associated with a decline in investment. The negative effect of corruption on capital quality is substantiated by theoretical models, showing that corruption could account for a sizeable share of the differences across countries in terms of economic development. ([194])

([188]) de Haan, et al. (1996). Vuchelen and Caekelbergh (2010) on EU countries find similar results by adding to their regressions expenditure gaps, which are equal to the difference between the nearest peak and the latest primary government consumption in GDP (%).

([189]) Myopia can be considered as the result of a finite planning horizon of the government (Rieth (2011)), or simply a short-term bias of policymakers who do not fully internalise future costs (Persson and Svensson (1989); Alesina and Tabellini (1990)).

([190]) Although supported by Van Dalen and Swank (1996) the political cycle theory is not confirmed by de Haan, et al. (1996) and Sturm (2001) studies. Our analysis in Chapter IV.3 however supports the idea of increased public investment in election years.

([191]) This hypothesis while is supported in Henrekson (1988) findings, it is not confirmed in de Haan, et al. (1996).

([192]) Grigoli and Mills (2014) Keefer and Knack (2007); Tanzi and Davoodi (1997).

([193]) Grigoli and Mills (2014); IMF (2015).

([194]) Chakraborty and Dabla-Norris (2011).

Box IV.2.2: Public and private investment: crowding in or crowding out

In designing economic stimulus (or fiscal consolidation) packages, an important question concerns the effect of public investment on private investment. From a theoretical perspective, a rise in public investment can have ambiguous effects on private investment. On the one hand, boosting public investment may be counterproductive, as it may deepen deficits and potentially hamper private investment (crowding-out effect). On the other hand, public investment can, through its impact on productivity/ private returns, lift private investment (crowding-in effect) and boost growth potential. Short-term and long-term effects may differ as the productive nature of public capital will take time to materialize: ([1])

- In the short run, both crowding-in and crowding-out effects on private investment may occur: on the one hand, a short-term, temporary crowding-in effect on private investment can occur through a boost in demand. On the other hand, the increase of public investment needs to be financed, which may imply more taxes – thereby decreasing the capacity of private actors to invest – or cause interest rates to rise due to a higher demand for funds from the government in the capital markets – thereby increasing the cost of borrowing for the private sector. The rise in taxes or in interest rates can both lead to a crowding-out effect on private investment, already in the short run and possibly over an extended period.

- Over the longer run, a crowding-in effect on private investment may also come from increased productivity or profitability of private investment: for instance by providing infrastructures increasing the productivity of private investment, or by bearing additional risks on long term projects that may generate activity.

Empirical studies show heterogeneous results due to a number of elements, including different countries and/or periods considered, as well as methodological aspects (models specifications, treatment of endogeneities issues and of lagged effects). ([2]) For instance, public investment may have led to expansionary effects on output and crowding-in in a majority of EU countries, but to contractionary effect on output and crowding-out effect on private investment in five EU countries. ([3])

There are in particular a number of (country-specific) factors that could increase the likelihood of a net crowding-in effect: a sound business climate, overall macroeconomic conditions, confidence, well performing banking and financial markets, low initial stock of capital, high investment needs, the type and efficiency of the public investment implemented and the sectors concerned. ([4])

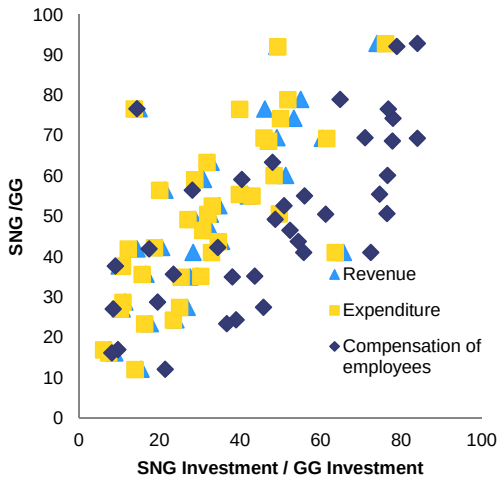
([1]) Aschauer (1989).
([2]) Bom and Ligthart (2014); Núñez-Serrano and Velázquez (2017).
([3]) See in particular Afonso and St Aubyn (2016); Afonso and St. Aubyn (2009). While the literature first focused on a production function approach, more recent papers have used a Vector Auto Regression (VAR) or an Error Correction Model (ECM) approach to take into account dynamic interactions among economic variables and lagged effects Voss (2002). Even by considering such approaches, results are heterogeneous across specifications and often not significant.
([4]) In Portugal, Andraz and Pereira (2007) show that the effects of public investment in transportation infrastructure tended to crowd-in private investment in most industries.

2.4. THE CRUCIAL ROLE OF SUB-NATIONAL AUTHORITIES IN PUBLIC INVESTMENT

National fiscal arrangements and the level of fiscal decentralisation

The role of sub-national authorities reflects the division of responsibilities between levels of government. There is a clear positive relationship between the relative sizes of sub-national authorities in terms of revenue, expenditure or payroll and their prominence in public investment (Graph IV.2.1). In addition, with the exception of Denmark and Estonia, the share of sub-national authorities in public investment is larger than their expenditure share (Graph IV.2.2) –a stylised fact which also holds in OECD countries.

Graph IV.2.1: **Share of sub-national governments in several budgetary items compared to its share in investment**

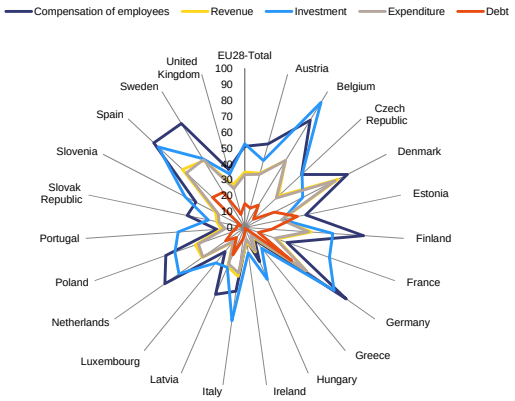


Source: Organisation for Economic Co-operation and Development sub-national government finance dataset, year 2015.

The degree of investment centralisation differs across EU Member States. ([195]) Investment in some Member States is largely centralised, such as Malta, Cyprus or Greece, but also to some extend Estonia or Croatia. The small size of these countries may explain this situation. Investment is on the contrary largely decentralised in Belgium or Germany, two federal states, or France.

Substantial changes in the investment responsibilities of sub-national authorities occurred in some member states over the last 20 years. ([196]) Trends towards more decentralisation have taken place in Nordic countries (Denmark, Finland, Sweden) and some new member states (Romania, Bulgaria, Slovenia, Slovakia). On the contrary, in Ireland, a drastic centralisation of investment took place over the last decade, and sub-national authorities' share in public investment declined from 75% to 15% in a decade. In Germany and Austria, local authorities have seen their share in public investment decline to the benefit of both the Länder and the federal state in Germany and to the benefit of the federal state alone in Austria.

Graph IV.2.2: **Share of sub-national government**



Source: Organisation for Economic Co-operation and Development sub-national government finance dataset, year 2015.

To finance such spending responsibilities, sizeable transfers from the central government are implemented. On average in the EU, ([197]) transfers from the central government represent 36% of the sub-national authorities' revenue, but only a fraction of these (3% of revenues) are directly linked to investment (capital transfers). In a group of Member States fiscal decentralisation in terms of the share of autonomously raised income is very reduced. Sub-national authorities are almost fully dependant on the funds received from the central government in Estonia and Lithuania

([195]) See Annex IV.1 for more details.

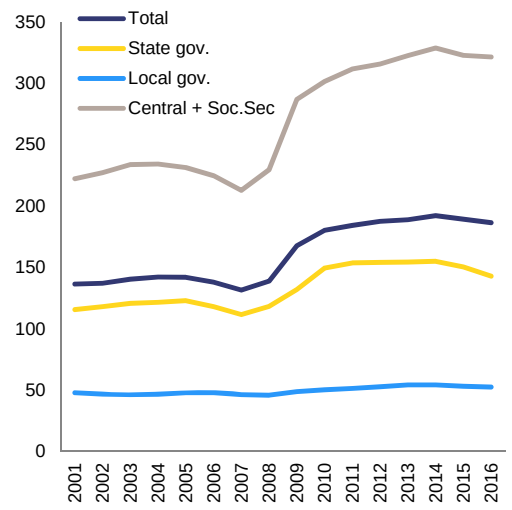
([196]) See Annex IV.2 for more details.

([197]) Bulgaria, Hungary and Poland are excluded due to non-availability of data.

(>80%), and in Greece, the UK, the Netherlands, Malta and Romania (around 70%). ([198])

The degree of fiscal decentralisation on the revenue side of sub-national authorities influences their investment behaviour. In the EU, where regions benefit from more fiscal independence (i.e. are able to control their revenues and/or be funded by locally levied taxes), they tend to invest more in productive capital. ([199]) However, fiscal decentralisation is mitigated by the distribution of earmarked capital grants which tend to limit regional initiative. This result is confirmed by an evaluation on Polish municipalities showing that investment depends positively on both their own resources and received grants, but is hampered but their indebtedness. ([200])

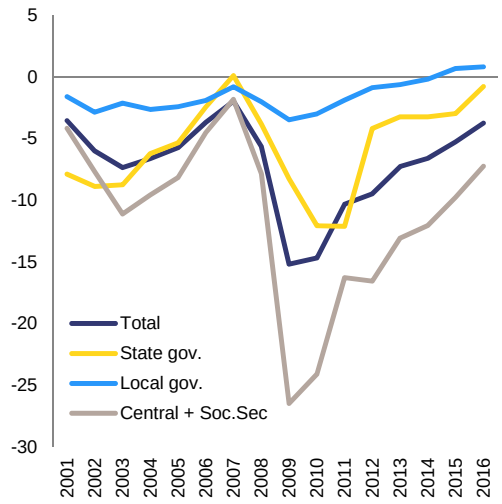
Graph IV.2.3: **Debt as a percentage of revenues by levels of governance**



Source: Eurostat.

The sub-national authorities are generally constrained by national rules, making them less prone to indebtedness and deficits. ([201]) This is particularly the case for the local level which operates with a deficit close to balance and little indebtedness (Graphs IV.2.3 and IV.2.4). The constraints imposed on the sub-national authorities by their national authorities are diverse: sub-national authorities can be forced to operate under a balanced budget, subject to stricter fiscal rules than the central level, or constrained in their ability to emit debt.

Graph IV.2.4: **Deficit as a percentage of revenues by levels of governance**



Source: Eurostat.

Recent developments

The crisis has challenged the financial arrangements between the central and sub-national levels in the Member States. At first, Spain, Austria or Italy have for instance given some slack to the sub-national authorities in the observance of their fiscal rules, or modified the distribution of tax revenue in their favour (Finland, Portugal). Other countries (France, Germany, Spain) and the EU have simplified or frontloaded their transfers to the sub-national governments. But the situation was later reversed in relation to the necessity to consolidate public finances. In some cases deficit targets or expenditure limits were introduced (Belgium, Spain, Denmark) or existing fiscal rules were tightened (Italy, Spain, Germany, Austria). ([202]) The ECFIN fiscal rule

([198]) See also the French country case in Sub-section IV.4.2.3.
([199]) Kappeler et al. (2013) study this question on a panel of 20 EU countries, and confirm previous findings Kappeler and Välilä (2008), Sekuła and Basińska (2016) provide similar conclusions in the case of Polish cities.
([200]) Banaszewska (2017), see also the German country case in Sub-section IV.4.2.1.
([201]) Vammalle and Hulbert (2013); Blöchliger, et al. (2010).
([202]) Blöchliger, et al. (2010) first document the expansion policies, three years later, Vammalle and Hulbert (2013)

database also shows new or stricter rules have been enforced on the local or regional level in the recent years in a number of countries. ([203])

The crisis could leave a long-lasting footprint on public investment. There were many permanent reforms introduced modifying the fiscal autonomy of the sub-national authorities, their budget constraint and their prerogatives. As a result the crisis may have triggered a structural change in the decisional process on general government investment.

To conclude an increased decentralisation of government investment functions entails trade-offs. On the one hand, local authorities can better identify and respond to the needs of investments than the central level (in the case of Spain this has been shown concerning roads and education expenditures). ([204]) On the other hand, in many cases central governments seem better placed to resist biases to local companies, avoid duplications, capture network externalities and increase cost-efficiency. For example, in Italy public works procured by the sub-national levels results in longer delays than at the central one even after taking into account administrative capacity.

2.5. GOVERNMENT INVESTMENT EFFICIENCY

Public investment spending does not necessarily translate one-to-one into public capital. ([205]) The investment process is long and complex and the relationship between public investment spending and the effective public capital stock is not straightforward. Efficiency of public investment management is a multifaceted concept which impacts all stages of public investment projects, for this reason it is also difficult to measure (Box IV.2.3). The academic literature already provides some analysis of the effect of inefficiencies on public investment. International institutions have provided a comprehensive framework to analyse the issue of inefficiency in the production process of government investment. Using such framework, some specific recommendations to tackle factors that hamper efficiency in the investment process are laid out in the literature.

Inefficiencies emerging from the literature

Inefficiencies can substantially reduce the value for money of investment projects. Cost overruns are a wide spread issue in public investment projects, affecting 9 transport infrastructures out of 10 for sizeable amounts (20%). ([206]) The overruns can be explained in particular by the selection procedures which bias the *ex ante* cost-benefit analysis and disregard risks. ([207]) Improving the cost-benefit analysis and performing *ex post* analysis can mitigate this problem. ([208]) A final relevant cause of inefficiencies could be long delays in implementing the investment projects. ([209])

"A minimal level of institutional quality […] is necessary for recipient regions to absorb transfers effectively". ([210]) The ability of regions to turn EU funds into higher investment and growth seems to depend on the quality of their governance among other determinants such as the level of education of its population.

comment fiscal consolidation measures and the many reforms engaged.

([203]) This is the case for BE, BG, ES, FR, IT, LT, NL, PT, see https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/fiscal-governance-eu-member-states/numerical-fiscal-rules-eu-member-countries_en

([204]) Esteller and Solé (2005) on Spain. Guccio et al. (2014) on Italy.

([205]) Pritchett (2000) highlights this nuance between the cost and the value of public capital.

([206]) Flyvbjerg et al. (2003) identifies sizeable and persistent cost overruns on infrastructure projects throughout the world, Pyddoke (2011) does so for Sweden but also summarizes 21 contributions on the topic.

([207]) Flyvberg (2009); Flyvbjerg (2014), see also the example of the Spanish high speed train in Sub-section IV.4.2.2.

([208]) In the case of Australia, Tan and Makwasha (2010) consider the issue of risk analysis. Quinet (2011) compares the outcome of different indicators. Pyddoke (2011); Flyvbjerg (2014) advocate the *outside view*, a benchmarking approach to correct *ex ante* estimation biases.

([209]) European Commission (2016a).

([210]) The citation is from Becker et al. (2013); Rodriguez-Pose and Garcilazo (2013) find that governance quality is key to make the most of the largest transfers of cohesion expenditure in the EU; Ederveen, de Groot and Nahuis (2006) reach a similar conclusion; Crescenzi, Di Cataldo and Rodríguez-Pose (2016) show that if infrastructure are beneficial to regional development its thanks to secondary roads as opposed to highway projects. On the contrary, Pellegrini et al. (2013) find that the growth effects of EU funds are modest and Dall'Erba and Le Gallo (2008) that these funds are not sufficient to counterbalance the strong effects of agglomeration economies.

The design of the procurement procedure is particularly prone to (in)efficiencies. In the case of Italy, it has been shown that sub-national authorities, through modifications of the procurement procedures can either induce a reduction of contracted costs or a decline in competition. ([211]) This likely also holds for the existence and effectiveness of mechanisms to solve the disputes between governments and private actors in case they arise in the course of the investment.

Corruption affects regions to different extents. On the case of infrastructure work in Italy, it has been shown that corruption at the sub-national level has a negative impact on efficiency as measured by delays and cost overruns. ([212])

An efficient management of government investments at the regional level can be hampered by the capacity of the sub-national authorities. A comparison of the performance of two Italian regions (Sicily and Basilicata) in the utilisation of European structural funds, reveals the importance of administrative capacity in explaining regional disparities. ([213]) Based on audits of projects financed from the Cohesion Fund, the Commission also identified administrative capacity as a key bottleneck to the full exploitation of structural funds. ([214])

A framework to systematically identify inefficiencies

Proposals have been put forward to put together these different aspects of public investment efficiency in assessment frameworks. ([215]) Such comprehensive approaches build on more specific reflexions in particular on the management of public finances, ([216]) on Public Private Partnerships, ([217]) on cost-benefit analysis ([218]) and on the capacities of sub-national government levels and the necessity of coordination. ([219])

These proposals cover all phases of public investments from the definition of a strategy to *ex post* assessment. The Public Investment Management Assessment (PIMA) framework (IMF), the principles on effective public investment across levels of government (OECD), the unified framework for public investment management (World Bank) all put forward similar capacities or institutions as ensuring efficient public investment. These are typically based on four phases, though the details may change across the proposals (Table IV.2.1).

- **In the planning phase**, insistence is put on strategic planning, on coordination across stakeholders, sectors and government levels and on projects' appraisal and selection. ([220])
- **In terms of financing**, securing plurennial financing is highlighted as an important factor in the more general context of the fiscal framework. ([221]) The use of innovative sources of financing engaging with the private sector (e.g. PPP) is often praised.
- **For the implementation phase**, modern practices in terms of public management (public procurement, transparency, project management) and the capacity among the civil services to achieve such high standards are emphasised.
- In the **evaluation phase**, the issue of formal compliance is raised while an effective and

([211]) Regional modifications of the national procurement rules proved beneficial to the public authorities in the Turin province but favoured local companies in Valle d'Aosta and Friuli; Decarolis and Giorgiantonio (2015), see also the Spanish country case in Sub-section IV.4.2.2.
([212]) Finocchiaro Castro et al. (2014).
([213]) Milio (2007).
([214]) European Commission (2011), see also the German country case in Sub-section IV.4.2.1.
([215]) See https://www.imf.org/external/np/fad/publicinvestment/, and in particular IMF (2015); Fainboim et al. (2013) for the IMF; http://www.oecd.org/effective-public-investment-toolkit/ and in particular OECD (2014) for the OECD; Rajaram et al. (2010); World Bank (2014) for the World Bank.
([216]) Spackman (2001) Cangiano et al. (2013).
([217]) The European Commission has produced a guide and a green paper on PPP European Commission (2003); European Commission (2004), the EIB also very active on this topic; EIB EPEC (2016); EPEC (2015a).
([218]) The European Commission dedicated a full guide to this topic European Commission (2008), the EIB; EPEC (2015b) as well as the World Bank; IEG World Bank, IFC, MIGA (2010).
([219]) Allain-Dupré and Mizell (2013); OECD (2013); Charbit and Michalun (2009).
([220]) See the Irish country case in Sub-section IV.4.2.4 for a plan to reverse the public investment drop.
([221]) In the case of Ireland, a sudden stop in public investment to ensure fiscal consolidation is highlighted as hampering investment quality, see Sub-section IV.4.2.4.

sound evaluation can be useful to decision making. ([222])

- **Throughout the different phases**, the capacity of the public administration, ([223]) the quality of governance and regulations, and the coordination across stakeholders, sectors and government levels are identified as a key support of public investment.

Some recommendations on improving efficiency from the literature

Through their research, academic authors provide specific advice on how to improve public investment along the same dimensions.

Ensuring sound financing is an issue highlighted by several authors. Perée and Välilä (2007) highlight the importance of securing **fiscal space** to allow new EU Member States the possibility finance the accumulation of public capital. For the same group of countries, Laursen and Myers (2009) emphasize the necessity to ensure **plurennial budgeting**. From their work on Polish municipalities, Sekuła and Basińska (2016) conclude that "local government entities should be granted the type of **own revenues** that they are allowed to structure to the greatest extent, since this is the type of revenues that most fully translates into investment activity, thus ensuring the strongest stimulus for development". If such sources of revenues have been granted to communes in Poland, they have not been to counties and regions.

Many papers advocate "policies that limit misconduct". ([224]) Flyvbjerg (2014) also insists on making forecasters (in charge of *ex ante* estimation or their validation) **accountable**, possibly in a court of law, to counter voluntarily deceitful behaviour which he documents. For Crescenzi, et al. (2016) "**institution-building** needs to be put at the top of the development agenda". They advocate in particular "**stricter rules** for project evaluation" both *ex post* and *ex ante*. For Finocchiaro Castro, et al. (2014), "the efficiency of the execution of public works could be improved by increasing the **accountability** of contracting authorities; among the others, enhancing **transparency** and supporting the development of **social capital** might be found as useful tools".

More generally, to promote public investment productivity, Perée and Välilä (2005) suggest building up a substantial project assessment capability by the public sector. While based on the Italian experience of public procurement, Decarolis and Giorgiantonio (2015) form broader policy recommendations concerning the urgency for ": (i) greater **coordination of reforms** between the central and the local levels; (ii) an enhanced role for the **sector authorities**; (iii) **improvements in national regulations** so that the regional and local authorities have less of an interest in modifying them; (iv) greater **transparency** and better **information** quality".

As for the growing practice of financing public purpose investment projects through public-private partnerships (PPPs), Turrini (2004) and Perée and Välilä (2005) observe how more transparency concerning the conditions underlying PPP and the accounting criteria, used to record PPP projects, would be desirable in order to ensure a proper evaluation of these practices on long term public finances.

Authors also identify ways to improve governance and management capacities and tools. Laursen and Myers (2009) build some recommendations based on case studies of 7 EU Member States. ([225]) Using the UK, Ireland and to some extend Spain as benchmarks to identify best practices, they recommend for new MS to strengthen their **strategic planning**, to resort to **cost-benefit analysis** and ***ex post* evaluations**, and strengthen the **project management skills** in the civil service. ([226]) To ensure greater value for money in public investment, Flyvberg (2009) also advocates better management **tools** and better **governance**. Grigoli and Mills (2014) advocate strengthening institutional **capacities**. Perée and Välilä (2007) mention similar directions for improvement: "safeguarding the quality of such investment is arguably even more important. This involves the complexities of **project appraisal, selection, and management** within the public sector."

([222]) Insufficient *ex ante* evaluation is highlighted in the case of Spain in Sub-section IV.4.2.2, *ex post* evaluation in the case of France in Sub-section IV.4.2.3. In the case of Ireland new regulation aims at strengthening this phase, see Sub-section IV.4.2.4.
([223]) See also the French country case in Sub-section IV.4.2.3.
([224]) Quote from Grigoli and Mills (2014).
([225]) Four new member states Poland, Latvia, Slovakia, Slovenia, and three old ones Ireland, Spain and the UK.
([226]) See also the Romanian case in Sub-section IV.4.2.5.

Table IV.2.1: **Sub-national capacities for effective management of public investment**

Stage of the investment cycle	Capacity
1. Planning and project selection	1. To engage in strategic planning that is tailored, results-oriented, realistic, forward-looking and coherent with national objectives*
	2. To co-ordinate across sectors to achieve an integrated place-based approach
	3. To co-ordinate with other jurisdictions to ensure complementarities and achieve economies of scale across boundaries
	4. To involve stakeholders in planning to enhance the quality and support for investment choices – while preventing risks of capture by specific interest groups
	5. To conduct rigorous *ex ante* appraisal*
2. Financing and budgeting	6. To link strategic plans to multi-annual budgets
	7. To tap traditional and innovative sources of financing for public investment*
	8. To mobilise private sector financing, without compromising the long-term financial sustainability of public investment projects
3. Implementation	9. To engage in transparent, competitive public procurement processes with corresponding internal control systems*
4. Evaluation	10.To design and use monitoring indicator systems with realistic, performance promoting targets*
	11.To conduct regular and rigorous *ex post* evaluation
	12.To use monitoring and evaluation information to enhance decision making
1-4. Throughout	13.To monitor and manage risks to integrity and accountability throughout the investment cycle
	14.To engage in "better regulation" at sub-national levels, with coherence across levels of government
	15.To ensure the quality and availability of technical and managerial expertise necessary for planning and executing public investment*

* Critical capacity across all types of regions.
Source: Table adapted from EOCD (2013).
Initially based on, in particular Allain-Dupré and Mizell (2013), Rajaram et al. (2010), Dabla-Norris et al. (2012) and Milio (2007).

At the national level, the centralisation of investment is debated and calls for different responses. From their research on public works in Italy Guccio et al.(2014) find that the sub-national levels are less efficient than the central one (even after taking into account capacity), therefore, they suggest "moving to **centralised** forms of management of public works that are able to exploit the economies of scale and employ adequate bureaucratic and managerial competences". Crescenziet al. (2016) on the contrary suggest providing "**technical guidance** to local governments lacking the administrative capacity".

Taking the lesson from these suggestions the European Commission since many years has put forward ways to improve the efficiency of the EU funds. While most researchers find a positive impact of EU funds on growth, this requires certain conditions to be met in particular in terms of quality of governance (c.f. supra). Solutions promoted by the Commission include improving and **supporting the capacities** in the Member States and their regions, ([227]) and **simplifying the rules** and requirements, ([228]) a step in the right direction according to Crescenzi et al. (2016) or Rodriguez-Pose and Garcilazo (2013). The former would nevertheless go even further to "[push] through effective **evaluation frameworks** […]. One way to do so would be to truly **condition the disbursement of EU funds** for infrastructure investment to the application of technical regulations for project evaluations". In this direction, in the programming period 2014-20, *ex ante* conditionalities have been introduced by which a number of framework conditions must be fulfilled before any payment is made. ([229]) Strengthened linkages between the EU funds and the European fiscal and macroeconomic surveillance procedures have been set up as well.

([227]) The Commission provides technical assistance to the Member States in direct management. The ESI funds also target this issue, in particular under the thematic objective 11 "Improving the efficiency of public administration".
([228]) European Commission (2011).
([229]) See also the Romanian country case in Sub-section IV.4.2.5.

Box IV.2.3: The difficulty of measuring quality of public management

The efficiency of public management is a multifaceted concept, therefore its measure is quite complex. Dabla-Norris and co-authors propose a public investment management index (PIMI) for 71 developing countries (cross-section). ([1]) This index, relying on experts or stakeholders judgement, focuses on four stages of the investment process: appraisal, selection, implementation, and evaluation. A correlation analysis of the PIMI with various indexes of governance quality shows that efficiency in the management of public investment is positively related to less specific measure governance quality such as the World Bank governance index used in Chapter IV.3. Indexes similar to the PIMI are widely used in the literature; ([2]) they offer a solution to quantify an uncountable concept but are tainted with limitations due to the subjectivity of the respondents.

An alternative measure is the public investment efficiency index (PIE-X). ([3]) PIE-X measures as efficiency the accessibility of public infrastructure and services compared to the optimal accessibility which could be obtained with a similar investment. It identifies inefficiency gaps as high as 13% for advanced economies and 27% for emerging markets. However, this index, built on cross country comparisons, does not control for factors, other than efficiency, which could influence the relationship between capital stock and accessibility. It has been shown in the context of Portuguese municipalities for instance that exogenous factors like geography, population age, tourism or education can influence such measures of efficiency without being under the control of the administration. ([4])

Against this measurement difficulty and acknowledging that governance indicators rank similarly countries for different activities, innovative measures have been proposed, for instance the time for a letter to be returned if it has been mailed to a wrong address avoids the above caveats and can be used to measure government efficiency. ([5])

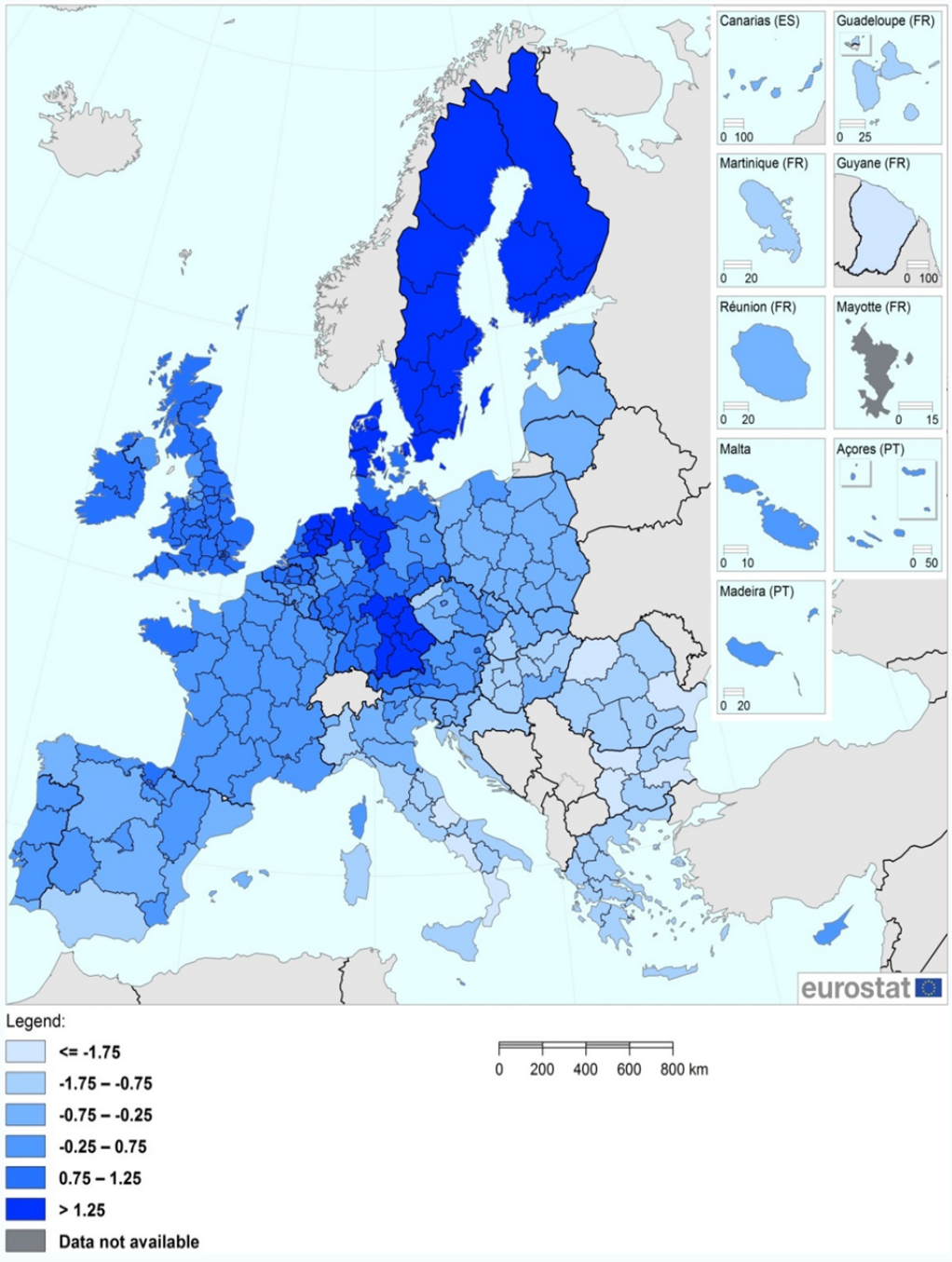
The literature shows that the efficiency of investment management varies from region to region. This is confirmed by measures of governance quality at the regional level (Graph IV.2.c). ([6])

([1]) Dabla-Norris et al. (2012).
([2]) See for instance Keefer and Knack (2007); Grigoli and Mills (2014); IMF (2015); Crescenzi et al. (2016).
([3]) IMF (2015).
([4]) daCruz and Marques (2014) consider efficiency not specifically in the context of public investment but also review the literature on local government's efficiency on top of analysing the Portuguese case.
([5]) Chong et al. (2014).
([6]) See Charron et al. (2012); Charron et al. (2014) for an evaluation at the regional level and Rodriguez-Pose and Garcilazo (2013) for combining the regional and time dimensions.

(Continued on the next page)

Box (continued)

Graph IV.2.c: **Quality of Government Index 2017**



Source: European Commission (2017c).

3. AN EMPIRICAL INVESTIGATION OF THE DRIVERS OF PUBLIC INVESTMENT WITH A FOCUS ON THE ROLE OF INSTITUTIONAL FACTORS

This section presents the findings of a new empirical analysis on the determinants of public investment with a specific focus on the impact of institutional factors, namely governance quality and fiscal rules.

3.1. ESTIMATION STRATEGY

The determinants of public investment are investigated with a panel data approach. The analysis concentrates on up to 28 EU countries (*i*) and 21 years (*t*), using annual data from 1995 to 2016. The analysis is conducted in two steps.

As a first step, the key drivers of public investment are determined in a baseline specification, which can be expressed as follows: ([230])

$$ln\ \text{public inv}_{i,t} = \beta_1 ln\ \text{public inv}_{i,t-1} + \beta_2 ln\ X_{i,t-1} + \vartheta_t + \theta_i + \varepsilon_{it}$$

where public investment is measured as the gross fixed capital formation of the public sector in per cent of GDP. The specification includes the lagged public investment on the right hand side of the estimated equation to take into account the persistence of public investment. *X* is a vector of key control variables derived from the literature (see below). Since the impact of these control variables tends to occur only gradually, they are included with a lag of one year. Furthermore, the specification includes year- (ϑ) and country-fixed effects (θ), while ε represents an error term. All variables are logged to simplify the interpretation of the coefficients. ([231]) The source of the variables and the summary statistics as well as the correlation matrix can be found in Annex IV.4.

The selection of explanatory variables follows the literature reviewed in Chapter IV.2. These variables control for the following transmission channels (the expected sign of the relationship with public investment is shown in brackets):

- *Persistence* (+) ([232]): lagged public investment
- *Macroeconomic conditions* ([233]): output gap (-), real GDP per capita (+)
- *Budget constraint* ([234]): headline/primary balance (-), total expenditure/revenues of the general government
- *Public debt* (-): gross debt of the general government
- *Financial conditions* (-) ([235]): real long-term interest rate
- *Demographic factors* (~) ([236]): share of persons above 65 years in the total population
- *EA membership* (+) ([237]): dummy = 1 since the year the country joined the euro area
- *Great Recession* (–): dummy = 1 for the years 2009 to 2012
- *Political economy channel*: partisanship (left governments +), election year (+)

As a second step, the baseline specification is augmented to analyse the impact of institutional factors on the provision of public investment. Chapter IV.2. concludes that institutional factors, in particular governance quality, matter for public investment. To measure their *direct* impact on public investment is challenging in a panel specification for technical reasons. ([238]) Therefore,

([230]) For instance, Mehrotra and Välilä (2006), Turrini (2004), Heinemann (2006).
([231]) We take the log of the value of the variable and add 10 for those variables, which can become zero or negative to avoid a selection bias.
([232]) Heinemann (2006).
([233]) Mehrotra and Välilä (2006). We additionally test TFP growth as a determinant for similar results. It however raises some multi-collinearity issues.
([234]) Turrini (2004).
([235]) Mehrotra and Välilä (2006).
([236]) Jäger and Schmidt (2016).
([237]) Heinemann (2006).
([238]) Their time variations are limited so that their impact is hard to identify in the presence of country fixed effects.

we consider the *indirect* impact of governance quality and fiscal rules on public investment via the public debt channel. ([239]) Public debt may have a stronger negative impact on public investment if the institutional quality is poor. As a consequence, the following interaction specification is estimated:

$$\begin{aligned} ln\ \text{public inv}_{i,t} = {} & \beta_1 ln\ \text{public inv}_{i,t-1} \\ & + \beta_2 ln\ X_{i,t-1} + \beta_3 Z_{it-1} \\ & + \beta_4\ ln\ \text{public debt} \\ & + \beta_5 ln\ \text{public debt} \cdot Z_{i,t-1} \\ & + \vartheta_t + \theta_i + \varepsilon_{i,t} \end{aligned}$$

where Z represents either governance quality or fiscal rules' strength, which is interacted with the public debt variable.

Two different indicators are used to identify institutional factors. First, the strength of the fiscal rules at the (sub-)national level. It is measured by a composite fiscal rules index of the European Commission, which takes into account the institutional framework conditions of the fiscal rule, such as its statutory base and the room for setting or revising its objectives. ([240]) Second, the quality of the governance framework. This is measured by the Worldwide Governance Indicator (WGI) of the Worldbank and it covers six broad dimensions of governance, such as government effectiveness and regulatory quality. ([241])

([239]) We also tested the impact of the institutional factors on public investment via the primary balance. The results appear slightly weaker and are not shown here.

([240]) The fiscal rule index represents a composite indicator, which is calculated taking into account five criteria (see Deroose et al. (2006): (i) the statutory base of the rule, (ii) room for setting or revising its objectives, (iii) the body in charge of monitoring respect and enforcement of the rule, (iv) the enforcement mechanisms relating to the rule, and (v) the media visibility of the rule. For the above criteria, for each rule scores are attributed. For more information see: https://ec.europa.eu/info/publications/fiscal-rules-database_en.

([241]) The Worldwide Governance Indicators report on six broad dimensions of governance over the period 1996-2016: (i) voice and accountability, (ii) political stability and absence of violence, (iii) government effectiveness, (iv) regulatory quality, (v) rule of law and (vi) control of corruption. The following results are based on a simple average of all six dimensions. The key findings are, however, unchanged when using a narrower definition, such as governance effectiveness. http://info.worldbank.org/governance/wgi/#home.

3.2. MAIN RESULTS

The empirical analysis points to a significant impact of several fiscal and economic variables on public investment in line with the existing literature (Table IV.3.1). The results from the baseline specifications confirm the strong persistence of public investment. As expected, an increase in public debt and in the real-long term interest rate tend to reduce public investment significantly. A higher living standard as measured by real GDP per capita seems to trigger higher public investment. ([242]) The Great Recession, as measured by a dummy variable for the time period 2009 to 2012, appears to have decreased public investment significantly. This can be partly explained by the fact that public investment was excessive in the pre-Great Recession years. At the same time, short-term budgetary pressures may have led to myopic policymaking, in which governments slashed public investment in order to achieve savings. Public investment also tends to be increased in election years ([243]), while no clear-cut effects can be found concerning the impact of partisanship. Overall, the results turn out to be robust to changes of the set of independent variables used, since the estimated coefficients do not change substantially in terms of size and significance level across the ten specifications.

High debt hampers public investment. This confirms previous findings from the literature. ([244]) In particular when quality of institutions is low, this effect is magnified as captured by the interaction term.

A meaningful interpretation of the interaction model requires analysing the coefficients of the interaction term closely. The impact of a change in public debt on public investment needs to be assessed taking the institutional factors (Z) into account. To ensure a meaningful interpretation of the results, partial derivatives are calculated distinguishing between short-term (ST) and long-term (LT) effects: ([245])

([242]) The coefficients of the economic cycle, the EA membership or the (headline/primary) net lending are not significant.

([243]) Our analysis cannot say whether the quality of public investment is impacted by election years.

([244]) Bacchiocchi et al. (2011).

([245]) Brambor et al. (2006); Braumoeller (2004).

Table IV.3.1: **Regression results - baseline specification**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	FE	FE	FE	FE	FE	FE	FE	SGMM-2step	FE Z = fiscal rules index	FE Z = WB governance
ln public investment, β_1 (t-1)	0.678***	0.690***	0.638***	0.717***	0.716***	0.715***	0.715***	0.722***	0.700***	0.718***
	(14.51)	(13.92)	(10.80)	(15.40)	(15.16)	(15.28)	(15.28)	(3.928)	(14.16)	(14.39)
ln public debt, β_4 (t-1)	-0.0966**	-0.0836**	-0.125***	-0.0839**	-0.0855**	-0.0831**	-0.0831**	-0.155***	-0.0836**	-0.127*
	(-2.155)	(-2.086)	(-2.865)	(-2.326)	(-2.378)	(-2.403)	(-2.403)	(-3.069)	(-2.559)	(-1.885)
ln real GDP per capita USD (t-1)	0.181*	0.170*	0.250**	0.233*	0.241*	0.239*	0.239*	-0.0213	0.287*	0.277*
	(1.823)	(1.738)	(2.248)	(1.959)	(1.933)	(1.933)	(1.933)	(-0.686)	(2.051)	(1.748)
ln output gap (t-1)	-0.413	-0.457	-0.178	-0.631	-0.650	-0.656	-0.656	0.175	-0.648	-0.751
	(-0.983)	(-1.124)	(-0.358)	(-1.358)	(-1.395)	(-1.392)	(-1.392)	(0.280)	(-1.447)	(-1.241)
ln long-term interert rate (t-1)	-0.0184*	-0.0150	-0.0223**	-0.0256***	-0.0266***	-0.0264***	-0.0264***	-0.0187***	-0.0242***	-0.0237**
	(-1.906)	(-1.686)	(-2.525)	(-3.380)	(-3.158)	(-3.113)	(-3.113)	(-2.642)	(-2.977)	(-2.365)
dummy EA member	-0.0290	-0.0355	-0.0403	-0.0472	-0.0498	-0.0431	-0.0431	0.0106	-0.0470	-0.0416
	(-0.877)	(-1.073)	(-1.261)	(-1.418)	(-1.432)	(-1.276)	(-1.276)	(0.470)	(-1.345)	(-1.248)
ln headline balance (t-1)		0.495								
		(0.949)								
ln primary balance (t-1)				0.361	0.359	0.408	0.408	0.219	0.467	0.584
				(0.849)	(0.853)	(0.977)	(0.977)	(0.305)	(1.116)	(1.232)
ln total revenue (t-1)			0.0339							
			(0.124)							
ln total expenditure (t-1)			0.00820*							
			(1.918)							
ln election year (t)				0.0722***	0.0727***	0.0726***	0.0726***	0.0490**	0.0722***	0.0882***
				(2.924)	(2.919)	(2.906)	(2.906)	(2.155)	(2.856)	(3.430)
ln government left (t)					0.0313	0.0317	0.0317	0.0448	0.0389	0.0159
					(0.657)	(0.648)	(0.648)	(1.072)	(0.771)	(0.312)
ln population share > 65 (t-1)						-0.132	-0.132	0.0759	-0.204	-0.168
						(-0.665)	(-0.665)	(0.971)	(-1.078)	(-0.891)
Dummy 2009-12							-0.0600**	0.0194	-0.0681**	-0.0631**
							(-2.225)	(0.817)	(-2.117)	(-2.325)
ln institutional quality (Z) (t-1)									-0.0731	-0.156
									(-0.893)	(-0.737)
ln public debt x Z, β_5 (t-1)									0.0144	0.0351
									(0.665)	(0.598)
Observations	453	442	441	403	403	403	403	403	403	379
# countries	28	28	28	28	28	28	28	28	28	27
R-squared	0.635	0.635	0.641	0.645	0.646	0.647	0.646		0.648	0.650
Wald time dummies (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.090	0.000	0.000
AR(1) (p-value)								0.030		
AR(2) (p-value)								0.428		
Hansen (p-value)								0.450		
# instruments								26		

Note: The sample includes up to 28 EU countries covering the period 1980-2014 using annual data. All estimations include time dummies, which are not shown due to space constraints. Estimation approaches: (1) Fixed effects using heteroskedasticity-robust Huber-White standard errors; (2) two-step system GMM (SYS-GMM) estimator following Blundell and Bond (1998), controlling for endogeneity of the lagged dependent variable, public debt and the real GDP per capita. Due to the small sample size the set of internal instrumental variables is restricted to up to 5 lags and the matrix of instruments is "collapsed" to limit instrument proliferation. The standard errors are corrected following Windmeijer (2005). AR(1,2) and Hansen tests confirm the validity of the system GMM specifications. Since the results appear robust to the choice of estimator used (FE vs. SYS-GMM), priority is given to the simple fixed effects specification. This is further justified, since the bias identified by Nickell (1981) is rather small in a specification with a rather larger number of years (T=21). ***, ** and * denote respectively statistical significance at 1, 5 and 10%.
Source: Author's calculations.

$$\left.\frac{\partial \ln public\ inv}{\partial \ln public\ debt}\right|^{ST} = \beta_4 + \beta_5 \cdot Z_{i,t-1}$$

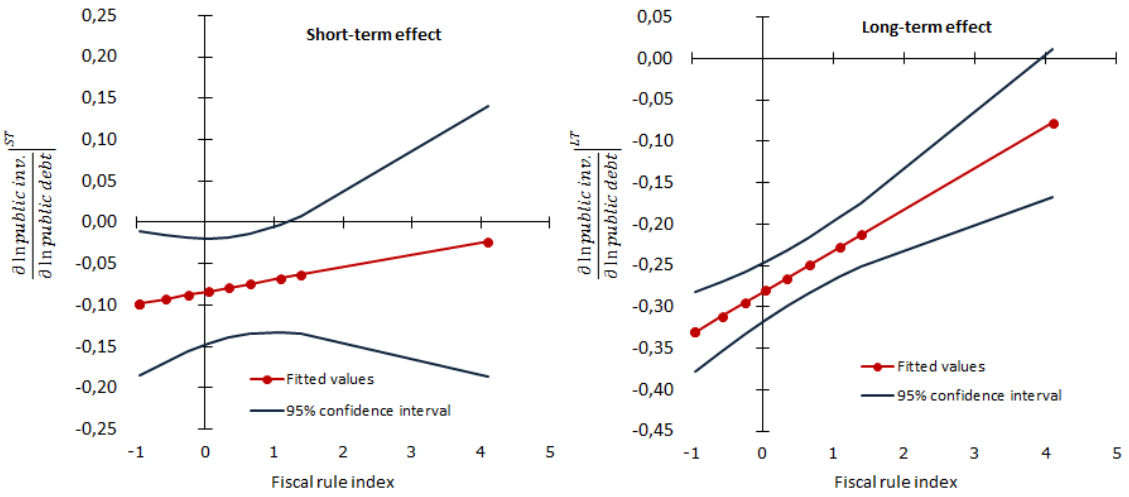
$$\left.\frac{\partial \ln public\ inv}{\partial \ln public\ debt}\right|^{LT} = \frac{\beta_4 + \beta_5 \cdot Z_{i,t-1}}{(1-\beta_1)}$$

These partial derivatives show that the impact of a change of public debt on investment depends on the institutional features (*Z*). This requires analysing the size and significance levels of the impact of public debt for the whole range of observed values of both institutional variables (Graph IV.3.1 and IV.3.2).

Stronger fiscal rules mitigate the negative impact from public debt on public investment. To be more precise, the negative impact from public debt on public investment becomes smaller, the stronger the fiscal rules index (Graph IV.3.1). The impact of public debt on public investment is therefore particularly strong for countries with very weak fiscal rules. For the highest observed value of the fiscal rules index (i.e. representing the strongest rules) the impact of public debt on public investment is no longer statistically significant in the short run, while it is only significant at the 10% level in the long run. Overall, the short-term effect of public debt is smaller than the long-term effect, because of the persistence of public investment (captured by the auto-regressive term).

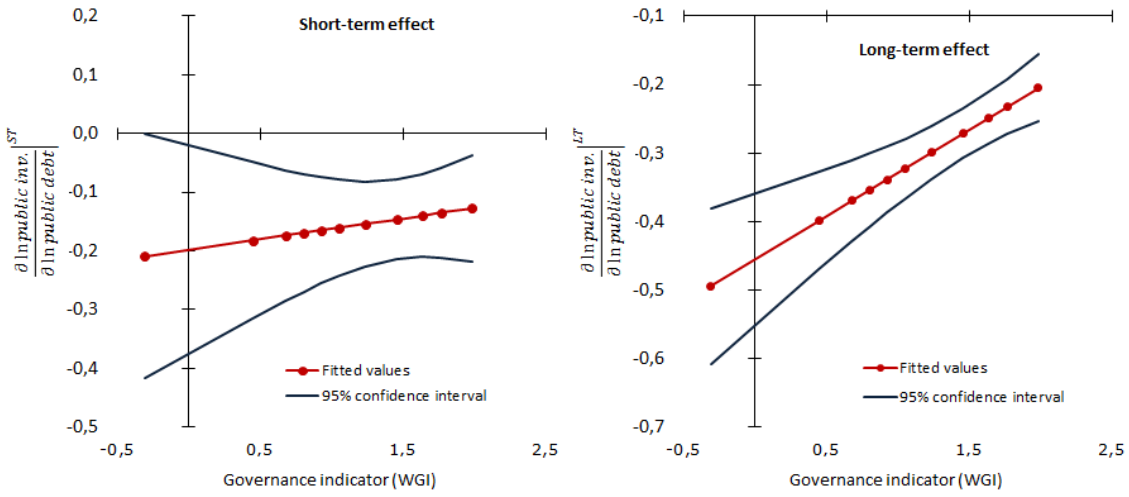
A higher quality of the governance framework reduces the negative impact of the public debt transmission channel (Graph IV.3.2). The long-term impact of public debt is more detrimental than the shorter-term impact.

Graph IV.3.1: **Reduction of debt impact through institutional quality - strength of fiscal rules**



Note: The figures show the impact of a change of public debt on public investment for changes of the institutional factors, which is measures by two indicators, namely: fiscal rule strength index (Graph IV.3.1) and governance quality (Graph IV.3.2). The fitted line and the confidence intervals are plotted for the whole range of observed variables, while the red circles on the fitted line indicate the distribution of the institutional factor starting from the minimum to maximum of observed values in intervals of 10%. The figures on the left (right) side refer to the short-term (long-term effects). The indicators of institutional quality are plotted for the observed range of values for the panel consisting of 28 EU countries for the period 1995 to 2016.
Source: Author's calculations.

Graph IV.3.2: **Reduction of debt impact through institutional quality - governance framework**



Note: The figures show the impact of a change of public debt on public investment for changes of the institutional factors, which is measures by two indicators, namely: fiscal rule strength index (Graph IV.3.1) and governance quality (Graph IV.3.2). The fitted line and the confidence intervals are plotted for the whole range of observed variables, while the red circles on the fitted line indicate the distribution of the institutional factor starting from the minimum to maximum of observed values in intervals of 10%. The figures on the left (right) side refer to the short-term (long-term effects). The indicators of institutional quality are plotted for the observed range of values for the panel consisting of 28 EU countries for the period 1995 to 2016.
Source: Author's calculations.

In brief, the regression analysis points to the importance of sound institutions for the provision of public investment.

Some caveats remain. First, like for every cross-country panel approach, the results reveal relationships which are valid only on average across countries, but may differ from on country to another. Second, the measures of institutional factors – namely the strength of the fiscal rules and the quality of the governance framework – are useful quantitative indicators. However, they cannot capture the full complexity of the institutional features at the country-specific level. This calls for supplementary case studies on the impact of the institutional factors on public investment.

Box IV.3.1: **Public investment gap**

Prolonged low levels of public investment can have a cost in terms of public capital or output growth but can also imply negative spillovers on neighboring countries. ([1])

Empirical evidence provides mixed indications regarding public capital undersupply. On the one hand, since the crisis, the current protracted reduction in government investment doesn't seem to have caused an increase of public capital productivity. ([2]) On the other hand, a large investment gap exists for the Euro area and for the OECD. ([3])

Three main methods are used to identify public investment gaps. A theoretical method identifies the gap between actual investment and its optimal level estimated using growth models. ([4]) An econometric method is based on the identification of the drivers of public investment (Chapter IV.3). The gap is measured in comparison to expected investment according to a selection of drivers. ([5]) A descriptive method compares investment with its level in a period of reference, for example pre-crisis. ([6])

The present estimation is based on the econometric approach. The main macroeconomic determinants of public investment are used to estimate the following panel regression:

$$gfcf_{it} = \beta_0 + \beta_1 y_{it} + \beta_2 r_{it} + \beta_3 debt_{it} + \beta_4 net\ lending_{it} + \beta_5 pop\ growth_{it} + \beta_6 stock_{it} + u_{it}$$

We use a time and country fixed effect estimator with clustered robust standard errors. In this way, both country-specific factors and events affecting, contemporarily, all countries are taken into account.

The sample covers EU Member States with annual data from 1995 to 2016. The sample is split between cohesion (CZ, EE, HU, LV, RO, HR, LT, PL, SK, SI, BG, CY, MT) and non-cohesion Members (AT, BE, DE, DK,EL, ES, FI, FR,IE, IT, NL, PT, SE, UK, LU). ([7])

The dependent variable (*gfcf*) is the ratio of gross fixed capital formation to GDP. The ratio to potential GDP as well as a broader concept of investment ([8]) still expressed in actual and potential GDP terms are used for robustness checks.

The explanatory variables are general economic and fiscal variables like the per capita real output (*y*), real long term interest rate (*r*), public debt ratio, fiscal balance ratio, all expressed in actual (or potential) GDP terms (consistently with the dependent variable). The level of per capita public capital stock (*stock*) and the demographic dynamic (*pop growth*) are added in order to better capture the investment needs. ([9])

In line with the literature, the coefficient of per capita output and population growth is positive in both samples, while all the others are negative (Table IV.3.a). The debt coefficient is the main difference between the two groups: the level of debt does not affect negatively investment in cohesion countries, it does so in non-cohesion countries (almost all characterized by a level of debt higher than 60%).

([1]) De Jong et al. (2017a,b).
([2]) De Jong et al. (2017a,b).
([3]) Baldi et al. (2014) find investment gaps of 0.5% and 2% over the 1999-2012 and 2010-2012 periods respectively in the Euro Area. Lewis et al. (2014) find, in 2013, an investment gap of 2.5pp of GDP for the OECD as a whole.
([4]) Auschauer (1989), (1998); Kamp (2005); Miller and Tsoukis (2001); De Jong et al. (2017a,b).
([5]) Baldi et al. (2014) and this Box.
([6]) Lewis et al. (2014).
([7]) The same distinction can be found in Mehrotra and Välilä (2006), in line with the considerable differences in public investment across these two groups in the sample years European Commission (2016a).
([8]) We adopt here a wider concept of investment including investment in human capital as the result of spending on health and education (investment in human capital), in innovation and technological development through spending in R&D and in infrastructure by spending in transport and communication.
([9]) The choice of variables follows in particular Turrini (2004) and Mehrotra and Välilä (2006), see also Annex IV.3 for a more detailed review of the variables used in such analysis.

(Continued on the next page)

Box (continued)

Investment gaps are obtained as a difference between the predicted investment rates for 2016 and the actual figures for the same year. ([10]) We focus on the existence of a gap rather than on its size because the latter depends on the model and the definition of investment considered (Table IV.3.b). ([11]) Depending on the persistence of a gap across models, countries are classified as suffering from an investment gap with certainty, almost certainty and no certainty.

Table IV.3.a: **Panel country-year fixed effect estimations**

	Cohesion	Non cohesion	Cohesion	Non cohesion	Cohesion	Non cohesion	Cohesion	Non cohesion
	GFCF (% of GDP)		GFCF (% of potential GDP)		Wider Investment concept (% of GDP)		Wider Investment concept (% of potential GDP)	
real_pca	1.637**	0.521	2.071**	0.792**	0.179	0.110	0.456**	0.403*
	(7.36)	(1.34)	(6.26)	(2.23)	(1.51)	(0.62)	(3.05)	(2.08)
real_intrate	-0.0103	-0.00944	-0.0119	-0.0129	0.00295**	0.00109	-0.000848	-0.00157
	(-1.77)	(-1.41)	(-1.73)	(-1.71)	(2.35)	(0.56)	(-0.35)	(-0.65)
capital_pca	-0.520**	-0.740**	-0.531**	-0.578	-0.103*	-0.301**	-0.0855	-0.184
	(-4.92)	(-2.41)	(-3.01)	(-1.71)	(-2.10)	(-2.24)	(-0.62)	(-1.19)
popgrowth	0.0685**	0.126**	0.0781**	0.182**	0.0234**	0.0171	0.0381**	0.0595**
	(2.29)	(2.58)	(2.66)	(3.45)	(3.22)	(1.32)	(3.14)	(3.60)
netlending	-3.404**	-1.767**			-1.377**	-1.333**		
	(-5.81)	(-4.99)			(-3.89)	(-5.53)		
debt	0.165**	-0.157*			-0.000592	-0.0272		
	(2.47)	(-1.81)			(-0.04)	(-0.84)		
netleding (% of potential GDP)			-3.735**	-1.751**			-1.388**	-1.252**
			(-4.28)	(-3.77)			(-2.58)	(-4.18)
debt(% of potential GDP)			0.227*	-0.106			0.0254	-0.00546
			(2.04)	(-1.07)			(0.83)	(-0.15)
_cons	5.680	11.67**	2.335	6.672*	8.069**	10.56**	4.804*	5.602**
	(1.47)	(3.80)	(0.45)	(1.96)	(4.27)	(7.82)	(1.85)	(3.41)
N	191	282	190	282	157	259	157	259
R^2	0.6105	0.5875	0.7772	0.6425	0.5510	0.7072	0.8381	0.8940

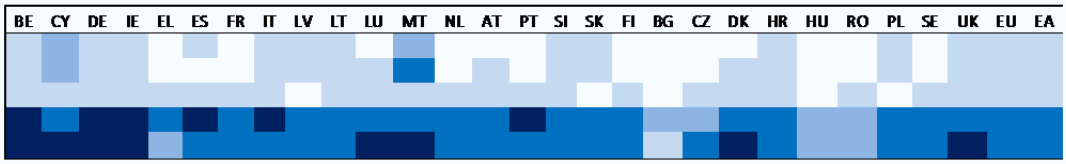
Note: All explanatory variables are in logarithm, except popgrowth and real_intrate. t-values in parentheses (significance:* p < 0.10, ** p < 0.05). Cluster robust standard errors and country-specific time trends and constants are used, although not displayed.
Source: Authors' calculations.

([10]) Because of missing data (in particular real interest rate) for EE the gaps for this country cannot be computed.
([11]) Estimation (7) of the baseline specification from Table IV.3.1 is also included to the analysis.

(Continued on the next page)

Box (continued)

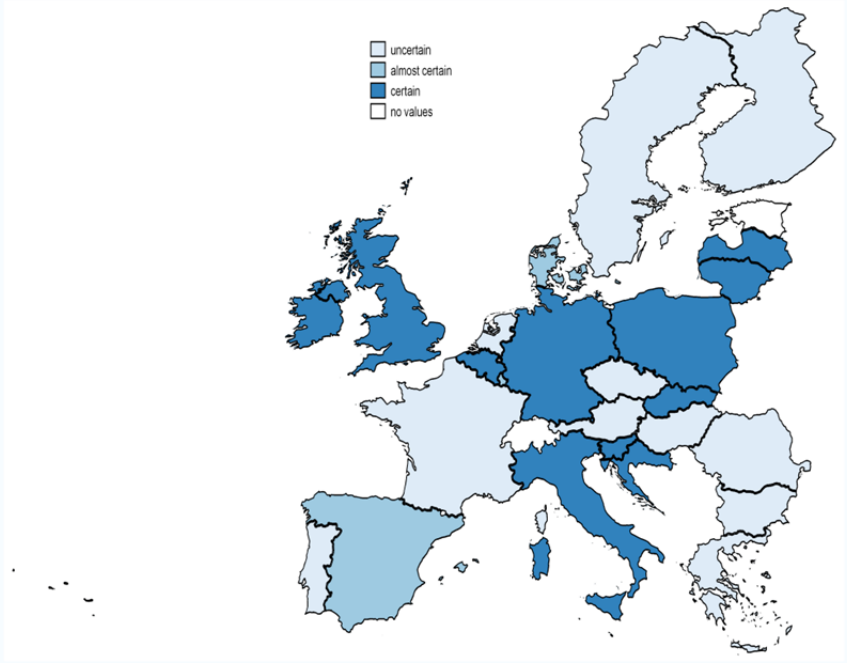
Table IV.3.b: **Heat map of investment gap intensity**



Note: The five models included are the four cases from Table IV.3.a and Estimation (7) of the baseline specification from Table IV.3.1.
Source: Authors' calculations.

An investment gap is found with certainty/almost certainty in more than half of the EU countries (Graph IV.3.a). This is in line with the observation that in almost all the EU members the 2016 level of government investment was still below its 1995-2007 average.

Graph IV.3.a: **Gap distribution**



Source: Authors' calculations.

4. FIVE CASE STUDIES ON INSTITUTIONAL FEATURES HAMPERING PUBLIC INVESTMENT

In order to have a deeper dive into the relevance of institutional factors, five case studies are proposed here examining the main institutional barriers (or drivers) of public investment in the selected EU Members. The views exposed in this Chapter do not constitute the official position of the Commission on the five Member States considered, but rather set out some tentative results. The descriptions below are not exhaustive but exemplify some of the key issues encountered at the different stages of the public investment process.

4.1. SELECTION OF COUNTRIES AND MAIN RESULTS

Selection of countries and contextual statistics

The selection of Member States aims at capturing a balanced mix of federal versus centralised Member States with different patterns of public investment. Germany and France were chosen as examples of a federal and unitary country, respectively, which experienced a sizeable long-term decline in investment, although at different levels. Spain was chosen as the example of a federal country and Ireland as a unitary one having experienced a pronounced property-led boom followed by a decline in public investment after the Great Recession. Finally, Romania was selected as a unitary country with a rather high and stable investment pattern, highlighting the role of EU funds in impacting public investment.

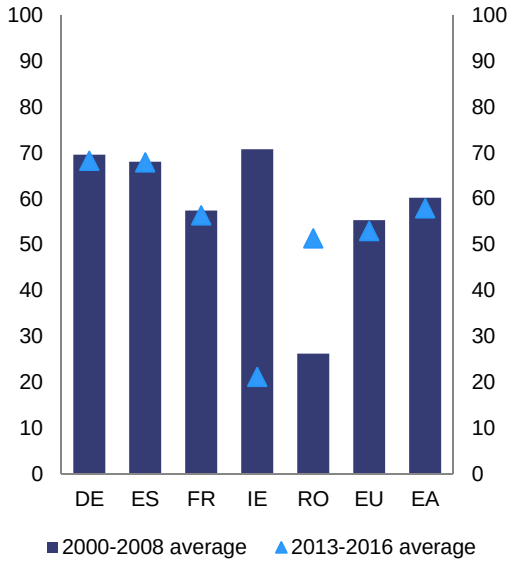
Table IV.4.1: **General government investment trends in the EU (% of GDP)**

Country/year	1990-1999	2000-2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
DE	2,4	2,1	1,9	2,1	2,4	2,3	2,3	2,2	2,2	2,1	2,1	2,1
ES	3,8	4,0	4,7	4,6	5,1	4,7	3,7	2,5	2,2	2,1	2,5	1,9
FR	4,3	3,9	3,9	3,9	4,3	4,1	4,0	4,1	4,0	3,7	3,5	3,4
IE	2,6	3,7	4,6	5,2	3,7	3,3	2,4	2,0	2,0	2,1	1,7	1,8
RO	2,8	3,4	6,3	6,7	6,0	5,7	5,4	4,8	4,5	4,3	5,2	3,6
EU28	n/a	3,1	3,2	3,4	3,7	3,5	3,3	3,1	3,0	2,9	2,9	2,7
EA19	3,2	3,1	3,2	3,3	3,6	3,4	3,1	2,9	2,8	2,7	2,7	2,6
New MS*	n/a	3,6	4,7	4,8	4,9	5,0	4,9	4,3	4,1	4,4	5,0	3,3
Cohesion 4**	n/a	4,2	4,5	4,7	4,9	4,5	3,4	2,4	2,3	2,3	2,5	2,0

Note: * joined the EU in 2004 and 2007, CY, CZ, EE, HU, LV, LT, MT, PL, SK, SI, BG and RO.
** EL, ES, IE and PT.
Source: Eurostat.

The share of sub-national public investment with respect to total public investment has followed different paths across the selected countries (Graph IV.4.1). In the EU on average as well as in Germany, Spain and France, the share of sub-national authorities in total public investment remained broadly constant before and after the Great Recession. By contrast, Romania decreased the share of public investment carried out by its sub-national governments, while Ireland's share of public investment at the sub-national level was reduced to the benefit of the central government.

Graph IV.4.1: **Sub-national investment as a share of total public investment**



Note: EU excludes the year 2000 for data availability reasons.
Source: Eurostat.

Main findings from the country cases

The five cases highlight that the efficiency can be improved across all phases of the investment process in most countries. Table IV.4.2 illustrates the topics discussed across the phases of the process of producing public investment: planning, financing, implementation and *ex post* evaluation phase (see also Section IV.2.5).

The case studies identify a clear need to improve planning. Issues relative to coordination across levels of government are exemplified in particular in the planning phase. While Spain seems to undergo formal and informal consultations of sub-national authorities, Ireland aims at doing the same by 2040 through a comprehensive review of its investment

programmes. *Ex ante* analysis is also found to be lacking in Spain. The definition of a long-term strategy is key in the planning phase. Romania is currently missing such a strategy, while Ireland is in the process of defining one. Some improvements in accounting for a longer horizon are also needed in the French case.

Table IV.4.2: **Topics discussed in the country analysis**

Country\ Phase	Planning	Financing	Implementation	*Ex post* evaluation	Throughout
Germany		Fiscal autonomy (-), Investment funds (+)			Administrative capacity (-)
Spain	Coordination (consultation) (+), *Ex ante* analysis (-)	Fiscal rules (=)	Public procurement (-)		
France	Impact assessment including long term (-)	Tansfers to SNG (-), Fiscal rules (=); Plurennial budgeting (+)		Ex-post evaluation (-)	Admin. capacity (-), Coordination (information sharing across levels of gov) (-), Territorial reform (+)
Ireland	New plans (+)	Sudden stop in financing (-), EU fiscal rules (=)	New spending code (+)		
Romania	Strategy (-)	EU Funds (+&-) and national program (PNDL) (+)	Public procurement (-)		Admin. capacity (-), Transparency-Political interference (-)

(+) are factors with a positive impact, (-) a negative impact, (=) neutral. For a same topic, both positive and negative sides can be discussed (+&-).
Source: Authors' elaboration.

Financing arrangements are an indispensable part of the functioning of the government investment cycle. They emerge as relevant in all cases. Transfers to sub-national governments have been cut in France, or on the contrary supported by national funds in Germany or both national and EU funds in Romania.

Public procurement influence the implementation phase. Romania and Spain suffer from weaknesses in public procurement. While Ireland aims at improving its project management with a new spending code.

***Ex post* evaluation can be improved.** In particular its lack is perceived as a problem in France where it is only optional at the local level.

Throughout the investment process, several issues constrain public investment. Capacity constraints at the sub-national level are a pressing issue in Germany, France and Romania and can have negative impact on all phases of investment projects. The lack of information sharing across government levels in France is also likely to affect the entire investment cycle. In Romania, lack of transparency and political considerations appear as particularly damaging throughout the phases of public investment.

4.2. DETAILED CASE STUDIES

4.2.1. Germany

Long-standing subdued municipal investment has resulted in a significant infrastructure investment backlog in Germany. Over the last decade, investment by the general government has only slightly increased to reach 2.1% of GDP and 4.8% of total public expenditure in 2016, and has inched back to the pre-crisis averages (Table IV.4.1) but remains below the averages of the EU/EA (2.7/2.6% of GDP). While public investment at the federal and federal states level as a proportion of GDP has remained largely constant since 1991, at municipal level it was on a downward trend during most of the 1990s and the first half of the 2000s and has only recently stabilised. Consequently, the municipal share in public investment has declined from 51% in 1991 to 35% in 2016. This decrease can partly be ascribed to strong infrastructure investment in East Germany in the early 1990s levelling off over time as well as to the privatisation of construction and operation of infrastructure. ([246]) In net terms, municipal investment has been negative since 2002, meaning that gross investment has fallen below depreciation. Efforts made in recent years to strengthen municipal investment have not yet resulted in a trend reversal. The longstanding investment weakness has contributed to an estimated investment backlog in municipal infrastructure of EUR 126 billion (3.9% of GDP), notably in terms of roads and schools. ([247])

A mismatch between available resources and investment responsibilities may have contributed to funding constraints for a number of municipalities. Federal legislation can impose tasks on lower levels of government without providing an adequate financial endowment. This is in line with the constitutional principle which stipulates that spending responsibility follows administrative responsibility, but may have contributed in particular to rising social expenditure and the financial distress of a number of

([246]) European Commission (2014a).
([247]) KfW Research (2017).

municipalities. ([248]) Moreover, limited revenue autonomy of federal states and municipalities reduces the scope for raising additional funds. In addition, it is observed that municipal fixed-capital formation tends to be lower the higher the overall indebtedness of municipalities. ([249]) The extent of short-term loans (*Kassenkredite*) also partly corresponds to investment activity. ([250]) A number of municipalities increasingly make use of short-term loans to finance structural deficits rather than for their purpose of bridging liquidity shortages. The use of short-term loans is higher in those federal states which are highly indebted and provide lower transfers to local authorities within their internal municipal equalisation scheme. ([251])

Measures have been taken to improve municipalities' fiscal situation and support their investment, though the uptake of extra funds has been so far limited. In recent years, the Federal Government has taken several steps to relieve municipalities of social expenditure ([252]) and to support investment spending of the federal states and municipalities in childcare facilities, transport infrastructure, urban development, social housing, energy-saving measures and broadband expansion. This included the creation of a special fund of EUR 3.5 billion (0.1% of GDP) in 2015 to support infrastructure investment of financially weak municipalities. ([253]) However, the special fund for financially weak municipalities has been used only to a limited extent. While by 30 June 2017 municipalities had budgeted almost EUR 3.1 billion (0.1% of GDP) for about 10,600 investment measures, amounting to 87% of the available funds, just 8% of the funds had actually been disbursed. This small fraction results partly from the necessary project planning and the fact that funds are disbursed only after billing. The reform of federal fiscal relations adopted in 2017 –with effect in 2020– should further improve the conditions for public investment at sub-national level. ([254])

Reduced planning capacity in many municipalities turns out to be an obstacle for a rapid increase in public investment. In municipal administrations, the number of employees dealing with construction, housing and transport –measured in full-time equivalents– has fallen by around one third between 1991 and 2011. These staff reductions can be partly explained by efficiency gains and the privatisation of planning services, but may also reflect the period of subdued municipal investment. ([255]) Inefficient administrative procedures and a lack of skilled staff, in particular civil engineers, also reduce the local planning capacity. ([256]) To this end, the reshaped consulting firm for public investment projects and the modernisation of public administration (Partner Deutschland PD) ([257]) offers extended consulting services with respect to infrastructure investment to the whole public sector from early planning steps up to project implementation.

The current high capacity utilisation in the construction sector may also temporarily limit increases in public investment. Production capacity in the construction sector has not kept up

([248]) Goerl et al. (2014); Sachverständigenrat (2004).
([249]) Expertenkommission im Auftrag des Bundesministers für Wirtschaft und Energie (2015).
([250]) The recourse to liquidity loans has been particularly pronounced in Saarland, Rhineland-Palatinate and North Rhine-Westphalia, while it has been virtually absent in Saxony, Baden-Württemberg, Bavaria and Thuringia. North Rhine-Westphalia and Saarland have also recorded the lowest municipal investment per inhabitant of all the federal states, European Commission (2016b).
([251]) Gröpl et al. (2010).
([252]) The federal government has partly or fully taken over expenditure relating to welfare benefits, accommodation allowances, basic security in old age and for people with reduced earning capacity, financial assistance for students and trainees, and the accommodation of asylum seekers and refugees.
([253]) The special fund was topped up in 2017 by additional EUR 3.5 billion for investment in school infrastructure.
([254]) In particular, extra revenue estimated at around EUR 9.7 billion in 2020 (0.3% of 2017 GDP), rising to EUR 13 billion by 2030, will be allocated to the federal states at the expense of the federal budget. However, the reform fell short of more fundamental changes in terms of increasing tax autonomy of federal states and municipalities, which could have further increased the scope for public investment, European Commission (2017).
([255]) Gornig and Michelsen (2017).
([256]) Public sector salaries make it difficult for local authorities to compete for high skilled workers. Lighter administrative procedures (digitisation) could release additional capacity. Moreover, providing more planning services centrally could relieve in particular smaller municipalities. Brand and Steinbrecher (2016).
([257]) The previously public-private consultancy firm to promote public private partnerships (ÖPP Deutschland AG) was transformed by the end of 2016 into a purely public body, with the Federal Government as the main shareholder. A number of other public entities have already indicated their interest in taking a share in the consultancy firm, including bigger and smaller municipalities, social insurances, public enterprises and federal states. It already employs almost 100 consultants specialised in various fields, Bundesministerium der Finanzen (2017).

with increased demand driven notably by the housing boom. Orders have reached record levels, and equipment utilisation has been higher than during the construction boom in the mid-1990s. ([258])

4.2.2. Spain

The share of Spain's general government investment over total investment is currently below both its pre-crisis and the EA average. In 2016, general government investment (1.9% of GDP) is considerably lower than its property-boom fuelled pre-crisis average (4.0% between 2000 and 2007), and also lower than the corresponding EU/EA averages (2.7/2.6%) (Table IV.4.1). Public investment is the spending category which experienced the largest reduction under the pressure of fiscal consolidation following the crisis (–61% between the 2009 peak and 2016).

The drop in total public investment after 2009 largely occurred at the sub-national level. In 2013-2016, regional and local governments accounted for 45% and 23%, respectively, of general government's investment (Graph IV.4.1). Over 2009-2016, the central government reduced its investment by 10.9% annually, but regions and local governments reduced investment by even more (11.2% and 16.5%, respectively).

There are concerns related to the historically low level of sub-national authorities' investment (1.3% of GDP in 2016). Protracted low levels of investment may compromise the quality of services provided by sub-national governments in the future. ([259]) It may also condition the regions' convergence capacity. The large drop in SNG investment could be seen as a correction of the high levels of investment in the pre-crisis period, as larger reductions were on average recorded in those regions which experienced a public investment boom in the pre-crisis period.

Existing national budget rules supporting fiscal consolidation in Spain do not differentiate public investment from other expenditures. Gross fixed capital formation falls under the scope of the spending rule set out in Spain's Stability Law, which in essence caps growth of government primary spending, net of non-discretionary expenditure on unemployment benefits and discretionary revenue measures, at the growth rate of Spain's medium term GDP. Dynamics in government investment are therefore called to contribute to ensuring compliance with the rule, as are other spending categories falling under its remit and/or additional revenue. In other words, the various tiers of governments are free to decide on the mix of revenues and / or current and capital expenditure which will enable them to comply with the Stability Law's expenditure rule. However, for local governments, which on aggregate have been running budget surpluses since 2012, special provisions apply, as those with sound public finances ([260]) can, under certain conditions, use their budget surplus to fund financially-sustainable investment. ([261])

A large share of investment at the sub-national level is directed to road and metropolitan transport. Investment on defence is a prerogative of the central government; health, education and general public services take a relatively large share in regional government investment; while for local governments housing and culture account for over a third of their investment. However, the majority of investment at all government levels goes into transport infrastructures. At the central level, spending goes to railways, maritime ports, airports and roads. Road and metropolitan transport accounts for the largest share of sub-national investment, the development and maintenance of the road network being a key competence for sub-national authorities. Indeed, 84% of the large road network of Spain – actually, one of the largest in the EU according to different metrics, ([262]) belongs to sub-national authorities.

The influence of sub-national entities in the planning of transport infrastructure goes beyond the projects they directly manage. While the planning and development of large transport infrastructure, covering airports, high speed trains and motorways, falls under the responsibility of the central government, sub-national governments can influence them. This can be done firstly

([258]) Gornig and Michelsen (2017).
([259]) De la Fuente (2016).

([260]) This includes, among others, compliance with the debt limits provided in the sectoral legislation and with the average payment rule to commercial suppliers.
([261]) The possible uses of budget surplus are set out in the sixteenth additional provision of Royal Legislative Decree 2/2004 on the local entities' financing system. Conditions to do so are set out in the sixth additional provision of organic law 2/2012 on budget stability and financial sustainability. The controller of the local government verifies compliance with the legal requirements.
([262]) European Commission (2015a).

through bilateral exchanges between representatives of the central and sub-national governments, and secondly, through the consultation processes set out in the sectoral legislation on each transport modality and on the environment.

Insufficient *ex ante* analysis of large infrastructure projects led to overinvestment in the pre-crisis years. Specifically, in the pre-crisis period, insufficient attention to cost-benefit analysis and undue emphasis on the territorial coverage led to inefficiently high levels of investments in roads, high speed trains and airports, implying welfare losses. ([263]) Examples include the Spanish high-speed rail (HSL) network which services only a limited number of passengers compared to the initial plan. Overestimation of demand and underestimation of costs (e.g. of expropriations) at the planning stage eventually resulted in the bankruptcy of nine motorway concessions. ([264])

In its EDP decision addressed to Spain in August 2016, the Council noted a series of irregularities in the application of procurement legislation in Spain. In particular, the Council pointed at disparities in the implementation of public procurement across Spain's contracting authorities and entities and insufficient *ex ante* and *ex post* control mechanisms. Moreover, Spain stands out for a low publication rate of contract notices and a relatively high use of the negotiated procedure without prior publication.

Sub-national authorities procure a large share of public work contracts, which are directly linked to government investment projects. Over 2013-2016, sub-national authorities accounted for 53% of the value of contract notices (*licitación*) of public work contracts in Spain. The bulk of sub-national authorities notices focused on roads, urbanisation, water supply and sanitation infrastructure. Spain's Court of Auditors points to irregularities with the application of procurement legislation at the local level, in particular on public work contracts. Such irregularities are concentrated in the pre-award stage of contracts, thus suggesting the need to increase *ex ante* controls. For example, based on a sample of audited contracts, the need to launch the procurement has in some cases, been insufficiently justified and the award criteria not properly spelled out, with the price not being considered an award criteria in some others. A non-negligible share of irregularities has also been found at the execution phase of public work contracts (e.g. delays in the execution of contacts and insufficient justification given to contract changes). ([265])

Several new measures aim to counter such irregularities. The recently adopted legislation transposing the latest package of public procurement directives ([266]) creates an Independent Office for Regulation and Supervision of Public Procurement, within the Ministry of Finance. This office will coordinate the supervision of all public contracting authorities and ensure the correct application of public procurement legislation. Moreover, an Office for National Evaluation (ONE) was created in October 2015 to assess the financial sustainability of public work concessions and service concession contracts. Regional governments are free to create their own office for evaluation or to adhere to ONE. However, at the time of writing, the office had not started its operations.

4.2.3. France

In France, the level of public investment is higher than in the EU and the euro area as a whole (Table IV.4.1). Public investment in France remains close to the pre-crisis level (3.9% of GDP) and has weathered well through the crisis. ([267]) Between 2008 and 2016, public investment has decreased by less in France (-0.5 pp.) than in the rest of the euro area and the EU (-0.7 pp.).

Public investment is broadly shared between the central and the sub-national level. The sub-national governments account for 57% of public investment (Graph IV.4.1), a share which has remained quite stable over time. ([268]) Local public investment can be further broken down among different categories of local authorities: in 2015, 57% of the local public investment was made by the communes, 22% by the *départements* and 20% by the regions. ([269])

([263]) De Rus (2015).
([264]) European Commission (2015a).
([265]) Tribunal de Cuentas (2016).
([266]) Law 9/2017 of 8 November on public sector contracts.
([267]) Cour des Comptes (2015).
([268]) Finances Publiques et Economie (FIPECO) (2017a) and Cour des Comptes (2015).
([269]) Finances Publiques et Economie (FIPECO) (2017b).

The recent cut in state transfers for local public investment had some temporary consequences on the local authorities' capacity to invest. In the aftermath of the economic crisis, the French government committed to substantially reduce its spending. This commitment concerned all levels of public administration and implied a cut in state transfers dedicated to local administrations starting from 2014. ([270]) A majority of sub-national authorities (71% of municipalities and 53% of *départements*) stressed that a continuous decrease in state grants could lead to a reduction of the number of newly implemented investment projects, ([271]) corroborated by the observed EUR 10 bn drop in local investments between 2013 and 2016.

The cut in state transfers and the budgetary discipline to which local administrations are subject, however, have not impeded local investment to accelerate in 2107. Local administrations are subject to a stricter budgetary discipline with respect to the central administration. First, functioning spending and investment spending need to be reported in two different sections of their budget. Second, local administrations need to follow a strict balanced budget rule, contrarily to the central government. In this perspective, local administrations have the possibility to take out a new loan only to finance a new investment. Existing debt (former loans) must be reimbursed through revenues coming from the functioning section or through certain resources from the investment section. However, these rules have not impeded local investment to rebound quickly after the drop observed in 2013-2016. This reduction in local investment proved to be short-lived, along with the fear that local authorities would have cut public investments rather than operating expenditures. Local investment is now expected to accelerate by 3.7% in 2017. ([272])

Local authorities are able to programme their investments through the adoption of multi-annual investment projects. Multi-annual investment projects require the adoption of an authorisation programme. Such authorisation programme indicates an upper threshold for investment spending. This allows them to spread the investment costs over several years. All regions, 55% of the municipalities, and 81% of the *départements* resort to multi-annual investment plans. ([273]) Also, a similar share of local administrations tends to finance investment activities as a whole rather than per project.

The effectiveness of local public investment, however, could still be improved by giving more priority to long-term projects. A precise evaluation of the long-term impact of investment projects can select the local public investments having a positive and lasting impact. ([274]) Local investment decisions should be taken with the aim to stimulate enterprises' production capabilities, increase living standards and public administrations' productivity.

Systematic information on local investment projects is lacking. In August 2012, the *Commissariat général à l'investissement* (CGI) was asked to compile an inventory of the currently implemented public investment projects. However, local investment projects were excluded from this inventory, so that the available information on local investment is still incomplete. ([275]) This omission points to a lack of coordination between the central and the local level of the public administration.

The evaluation of implemented investment projects remains voluntary at the local level. The 2012 public finance programming bill (*Loi de programmation des finances publiques*) made a socio-economic assessment of implemented projects mandatory. This assessment consists in identifying and evaluating the gains and costs of an investment project for all economic actors. However, it remains voluntary for local authorities, as they do not have the same financial means as the national administration to assess the impacts of their investments. Contrarily to *départements* and regions, only 25% to 30% of local authorities have experimented follow-up schemes or launched studies about their usefulness. This implies that the majority of local authorities still does not have a

([270]) Cour des Comptes (2015).
([271]) Caisse des Dépôts (2014). Moreover, 76% of the municipalities and 65% of the *départements* pinpointed even that such a decrease could delay the implementation of already validated projects or put their existence at risk. The study also predicted a 7.4% decrease (i.e. between EUR 10.8 mn and EUR 11.8 mn) in the amount annually spent by *départements* on investment between 2015 and 2020.
([272]) La Banque Postale (2017).
([273]) Caisse des Dépôts (2014).
([274]) Cour des Comptes (2015).
([275]) Cour des Comptes (2015).

follow-up scheme for investment projects or does not assess the savings enabled by new equipment or their efficiency by comparing their achievements with the initial goals. ([276])

The 2015 territorial reform is expected to progressively increase the efficiency of local public investments and to allow local authorities to systematically evaluate projects. Municipalities will have the opportunity to pool their human and financial means to provide more and better investment. ([277]) Pooling of resources may allow decreasing the costs of local investments and hence to increase the level of investment. It may also increase the quality of investment, by allowing local administrations to select projects with a longer-term horizon as well as to provide an evaluation of selected projects.

4.2.4. Ireland

Following the pre-crisis boom, government investment in Ireland collapsed during the Great Recession. Over the last five decades, the general government's gross fixed capital formation has displayed large fluctuations: it peaked above 5% of GDP in 1974, 1980 and 2008, while falling below 2% of GDP both at the end of the 1980s and in 2015-2016. ([278]) During the 1990s, government investment steadily increased, fuelled also by the housing boom. The trend reverted abruptly with the Great Recession, as cuts in public fixed capital formation were one of the main drivers behind the fiscal consolidation. As a result, government investment averaged 1.9% of GDP over 2013-2016 (Table IV.4.1), much below both the EU average and Ireland's pre-crisis average levels (1990-1999 and 2000-2006). The crisis led to a structural shift in the composition of public expenditure in favour of current spending. ([279])

The halt of government investment affected the quality and adequacy of infrastructure. Cuts in government investment in Ireland mainly focused on environmental protection, housing, transport, public order and safety, and, to a lesser extent, defence, education and R&D. As a consequence, pressure points have emerged in a number of areas, against the backdrop of a resumption in economic growth. In particular, housing, water services and public transport have been facing interrelated challenges. By the same token, the unprecedented increase of government capital expenditure until 2008 called into question the efficiency and the *value for money* of this investment. ([280]) Maintaining competitiveness on the global level for a small and very open economy such as Ireland partly hinges on addressing these infrastructure congestions and bottlenecks through a sustainable, efficient and well planned public investment strategy.

Against this background, a new Infrastructure and Capital Investment Plan was published in order to set the ground for an envisaged trend reversal. The plan, announced in September 2015, has defined priority needs in transport, education, housing and health care and also envisages additional investments by semi-state companies. The government allocated close to 10% of GDP over 2016-2021. At the end of 2016, sustained economic growth and the stabilisation of public finances have enabled the government to commit to an additional 1.8% of GDP. While 0.8% of GDP has already been pre-committed to support the Government's Action Plan on Housing and Homelessness, the remaining additional funding was planned to be allocated in budget 2018. Furthermore, the government intends to redirect part of the planned "rainy-day fund" to finance additional investment in physical and social infrastructure. ([281]) Capital expenditure is now expected to reach 2.3% of GDP in 2021, up by 85% compared to 2016 levels. ([282]) A ten-year National Investment Plan for the period 2018-2027 is scheduled to be published in the course of 2018. However, there are some doubts over the degree to which the construction industry, as a key stakeholder in the delivery of publically funded infrastructure, has the capacity to respond to such plans, with access to credit representing a much cited constraint for the industry in the aftermath of the financial crisis.

([276]) Caisse des Dépôts (2014).
([277]) Martin et al. (2015).
([278]) The effect of globalisation and the operations of multinationals increasingly distort GDP as a measure of the size of the economy, in particular after the exceptional GDP surge in 2015.
([279]) In 2013-2016, investment spending averaged only 6.5% of the total expenditure (net of interest expenditure and other capital transactions), 2.5pps lower than Ireland's 1990-2015 average.
([280]) Scott and Bedogni (2017).
([281]) Department of Public Expenditure and Reform (2017).
([282]) Using the modified gross national income (GNI*), which accounts for the impact of globalisation, public investment is projected to meet the 3% historical level from 2019 onward.

Over a longer horizon, the authorities are preparing a national planning framework to cope with coordination issues (*Ireland 2040*). Ireland has a poor track record in terms of spatial planning at a national level, while the planning system can lead to excessive delays in bringing forward individual projects at a local level. In 2017, the government launched a consultation for the preparation of a strategic planning and development framework for Ireland and its regions for the years ahead. Heavy emphasis is put on better coordination (between national, regional and local authority) to avoid the mistakes made in the past. The Plan, a draft of which was published for consultation in September 2017, is intended to consider different dimensions (regional, social, economic and environmental) over a longer horizon.

A centrally-led review of capital programmes is meant to ensure coherence between local and national priorities. Government's funding allocation in Ireland follows a review process led by the Department of Public Expenditure and Reform (DPER) on the basis of analysis undertaken by the newly established Irish Government's Economic and Evaluation Service (IGEES), central Government Departments and agencies with sectoral responsibilities. The analysis includes a detailed assessment of demand requirements and priorities for capital spending. Claims from sub-national government level are collected and managed by the Department of the Environment, Community and Local Government. These departments also ensure that projects comply with the appropriate regulatory requirements including those related to planning law and environmental impact assessments.

Efforts to improve quality and effectiveness of public spending need to be supported with institutional reforms. The Public Spending Code launched by the DPER in late 2013 is intended to improve project management. Its objective is to ensure a comprehensive and uniform approach to project appraisal and evaluation under the new Capital Plan. All Government Departments and agencies are responsible for ensuring that value for money appraisal and evaluation is carried out in relation to the planning, management and delivery of Government expenditure programmes and projects. ([283]) At any stage a project can be abandoned if its continuation would not represent value for money. ([284]) Reforms also occurred in other government bodies and notably in the transport area, where the National Roads Authority and the Railway Procurement Agency were merged into the new Transport Infrastructure Ireland (TII). This new agency is now the core of expertise in Ireland for the planning, delivery and management of capital transport projects. It is intended to transfer the PPP procurement functions of the National Development Finance Agency into TII.

Despite the above described policy efforts, calls to prioritise on public investment have grown. The most recent official budgetary plans imply that capital investment to GDP will remain subdued for the coming years. Business and employer associations have already stressed that they see a greater need for public sector infrastructure development on top of what is provided by the private sector. ([285])

([283]) For proposals over EUR 5 million, a preliminary appraisal should be undertaken by a Sponsoring Agency. The Sponsoring Agency has the overall responsibility for the proper appraisal, planning and management of projects/schemes. Sponsoring Agencies are also responsible for post-project review. The Sponsoring Agency may be a Government Department, local authority, health agency, University or other State body. In some instances the Sponsoring Agency and the Sanctioning authority, in relation to individual projects, may be the same body, e.g. the National Roads Authority or non-Exchequer funded commercial State Companies.

([284]) The sequence of decisions is meant to lead to progressively greater commitment of resources, but an irrevocable commitment to a proposal should only be made after all appraisal stages have been passed, and final approval obtained by the Sanctioning Authorities. The Sanctioning Authority is responsible for granting the approvals required as projects/schemes, funded with public assistance, proceed through the project/expenditure life cycle. The Sanctioning Authority is normally the Government Minister or Department or public body with sectoral responsibility for implementing Government policy and for providing public financial assistance in that sector. In the case of major projects the sanctioning authority may be the Government. As a rule the Government will be the Sanctioning Authority for very large projects, costing more than EUR 100 million, but the Government could also be the Sanctioning Authority for projects below this value.

([285]) In a recent publication, the national authorities estimated that the existence of an expenditure rule at the EU level had decreased the ratio of gross fixed capital formation to GDP by almost 0.6%, which was reported to be robust and statistically significant across all their estimated models. See for details: Department of Public Expenditure and Reform (2016). However, it is worth recalling that, while EU rules already take into account some degree of flexibility, at the same time they allow to increase investment spending as long as it is financed by raising

4.2.5. Romania

Romania, as one of the catching-up economies in the EU, has one of the highest public investment ratios both before and after the crisis. Public investment exceeded 6% of GDP before the outbreak of the crisis in 2008, well above the EU average for the same period (Table IV.4.1). Despite the sharp correction observed in 2016, which is mainly due to the end of the 2007-2013 programming period and the slow start of the new generation of European Structural and Investment Funds (ESIF) supported programmes, Romania's long term average remains above that of the EU. The central government still accounts for nearly 50% of the total public investment over 2013-2016 despite a decentralisation movement since the pre-crisis period (Graph IV.4.1).

EU funds account for a significant share of public investment in Romania despite the delayed start of the new generation of EU-funded programmes. ([286]) The share of EU-funded investment over total general government investment stood at more than 35% on average between 2013 and 2016, despite the drop observed in 2016. This decline is nevertheless expected to be reversed in the future once the implementation of the current generation of EU-funded programmes picks up. ([287])

Long-term planning of public investment spending was enhanced but results are still to come. In key infrastructure such as transport and networks, a strategic framework for investment is either non-existent or fragmented and often dependant on changing political priorities. A Public Investment Evaluation Unit was set up in 2013 within the Ministry of Finance with the aim to evaluate and prioritise large infrastructure projects. The Unit became functional in 2016 and this is a first step to address the lack of planning, prioritisation, implementation and monitoring of investment projects. Its role has been positive in amending the relevant legislation to oblige line ministries to finance the most important projects according to the prioritisation. ([288]) The Unit's role is to maintain and update annually the criteria to define the list of large projects (currently 123 of them) receiving financing either from the state budget, EU funds or both. In this context, the Unit also started a pilot project aiming to define a new methodology for rationalizing investments. However, the allocation of funds by line ministries to the many projects in the priority list remains under their appreciation within the legal framework. Control over whether the choice of projects follows the prioritisation is ensured by the Court of Auditors and the Economic and Financial Inspection division from the Ministry of Finance upon input of the above-mentioned Unit. Whether actually the control is put in place and pressure on line ministries towards the prioritization is exerted, requires thereby constant will by the finance minister. Notwithstanding these positive developments, the list of priority projects is still very long and contains 50 projects that are older than 10 years.

A partnership agreement setting out the planned use of the ESI Funds sought to partly address the lack of strategic focus. The partnership agreement, signed with the Commission ahead of the implementation of the new seven-year programme period for 2014-2020, seeks to concentrate resources on a limited number of clearly defined thematic objectives. To ensure an efficient and effective use of ESI funds, a set of *ex ante* conditionality conditions (EACs) had to be fulfilled at an early stage of the programming period. The EACs requested not only the improvement of the framework conditions for investment, such as public procurement, but also the preparation of long-term strategic plans for sectors such as transport, public administration and health.

The implementation of EACs has stimulated reforms, but progress remains slow. While EACs helped steering structural reforms in Romania over recent years, the country still faces

revenues or reducing other expenditure. Similar considerations have been presented by the annual report of the Irish fiscal council (Irish Fiscal Advisory Council, 2016) who emphasizes the need to carefully balance the desires for relaxed rules on capital spending with the sustainability of public finances, given the need to bring the debt down and to provision for future demographic pressures.

([286]) "EU funds" include ESI Funds as well as other directly managed EU funds.

([287]) For a discussion on the role of EU funds supporting public investments in a regional perspective, see European Commission (2016a).

([288]) The ranking of the largest projects for Romania decided by the government is based on a set of efficiency indicators developed by the Unit on the basis of a score assigned by the line ministries. New projects can be considered by line ministries when promoted through a specific legal procedure.

difficulties in implementing a number of EACs in areas such as public procurement, transport, environment, research infrastructure and public administration. The execution of the action plans for the fulfilment of these EACs is significantly delayed (formal deadline was December 2016) and this could result in the suspension of payments to a number of operational programmes.

The difficulties in fulfilling the EACs reflect a broader difficulty in planning on a longer-term horizon. This is a key element for the preparation and implementation of large infrastructure projects whose life cycles are longer than the political ones. As a consequence, Romania is currently facing a worrying paradox: despite the very high need for infrastructure development, there are very few mature investment projects in the pipeline to be supported by EU funds or other sources such as the EIB.

The financing from ESI Funds requires (close) monitoring. As for other EU Member States, the implementation of ESI funds is managed jointly by the Commission and Romania. In order to monitor progress towards the objectives defined at the beginning of the programming period, each operational programme uses a set of indicators for which clear and measurable milestones and targets are defined. Progress is reported annually by the Member States. In 2019, the Commission will review the performance of all operational programmes up to the end of 2018. Following this performance review a performance reserve of 5–7% shall be allocated to the programmes that had achieved their milestones at the end of 2018.

The setting up of the National Programme for Local development (PNDL) seeks to tackle the fragmentation of investment spending by local authorities. The PNDL represents one of the main public investment tools financed by the state budget, under the management of the Ministry of Regional Development and Public Administration (MDRAP). The programme was created in 2013 by grouping several investment programmes financing local infrastructures which were previously independent from one another. The PNDL generally finances small and medium size infrastructure projects that do not fulfil the eligibility criteria for EU funds. Similarly to the operational programmes financed by ESI Funds, the PNDL is a multiannual programme, though not framed by multi-annual financial programming, unlike EU-funded programmes.

At national level the disbursement of funds to local authorities seems to be impacted to a large extent by political considerations. The selection process of local investment projects financed through transfers from the state budget could benefit from higher transparency. Decisions approving the disbursement of financing appear at times to be timed with the political calendar or other short-term priorities unrelated to technical aspects.

The implementation of the 2014-2020 ESI funds programmes started with a considerable delay. This delay is mainly due to the late adoption of the new legal basis, delays in the implementation of previous programmes and lack of viable new projects. The managing and certifying authorities have been only notified in the summer 2017, which means that Romania can now submit payment application for eligible expenditure actually incurred on the ground (interim payments). The accumulated delays could elevate the risk of lost development opportunities against the backdrop of the de-commitment rule applicable to ESI Funds. ([289]) The purpose of the rule is to ensure that implementation of projects progresses at a reasonable speed. Such a mechanism does not appear to exist for the investment programmes financed exclusively from the state budget.

Low implementation rates for ESI funds together with high investment rates at national level suggest the existence of a substitution effect. The funding made available via the ESI funds is meant to reduce economic, social and territorial disparities, complementing national sources. The very low absorption so far (reimbursements of expenditure were approximately 8% of the ESIF envelope for Romania against some 11% for EU overall) in the context of an insufficient and largely inadequate infrastructure raises several questions regarding the administrative capacity of national authorities in applying the rules governing access to ESI funds.

([289]) Funds made available under the ESI Funds are subject to an automatic de-commitment rule which foresees that a commitment made in year N has to be covered by pre-financing and interim payments by the end of year N+3. The amount unclaimed is lost for the Member State concerned.

5. CONCLUSIONS

Government investment remains at the top of the policy agenda in the EU. Last year's edition of the Report on Public Finance in EMU dedicated a full part to government investment. It concluded to the existence of investment gaps in the EU and that higher investment was needed to achieve both short and long term benefits. The current edition of the report analyses possible drivers for such poor increase in government investments, with a focus on the role of key institutional factors, the institutional arrangements across levels of government, the quality of governance and national fiscal rules.

Governance quality is a key element to improve the value for money. This is the case both at the national and the sub-national level in all Member States. Improvements are possible in all phases of the investment process, in particular with respect to the administrative capacity, coordination, evaluation, secured plurennial financing, as exemplified in the selected case studies.

Sub-national governments are at the forefront of public investment. Sub-national authorities are major providers of public investment but rely for a sizeable share on central government financing. Local governance, institutional arrangements and coordination across levels of governance are therefore key elements for the proper provision of public investment.

A solid fiscal framework can support public investment. Government investment is hampered by high debt levels and used as an adjustment variable in times of fiscal consolidation. On the contrary, strengthened fiscal rules mitigate the depressionary effect of public debt and allow for a smooth financing of public investment.

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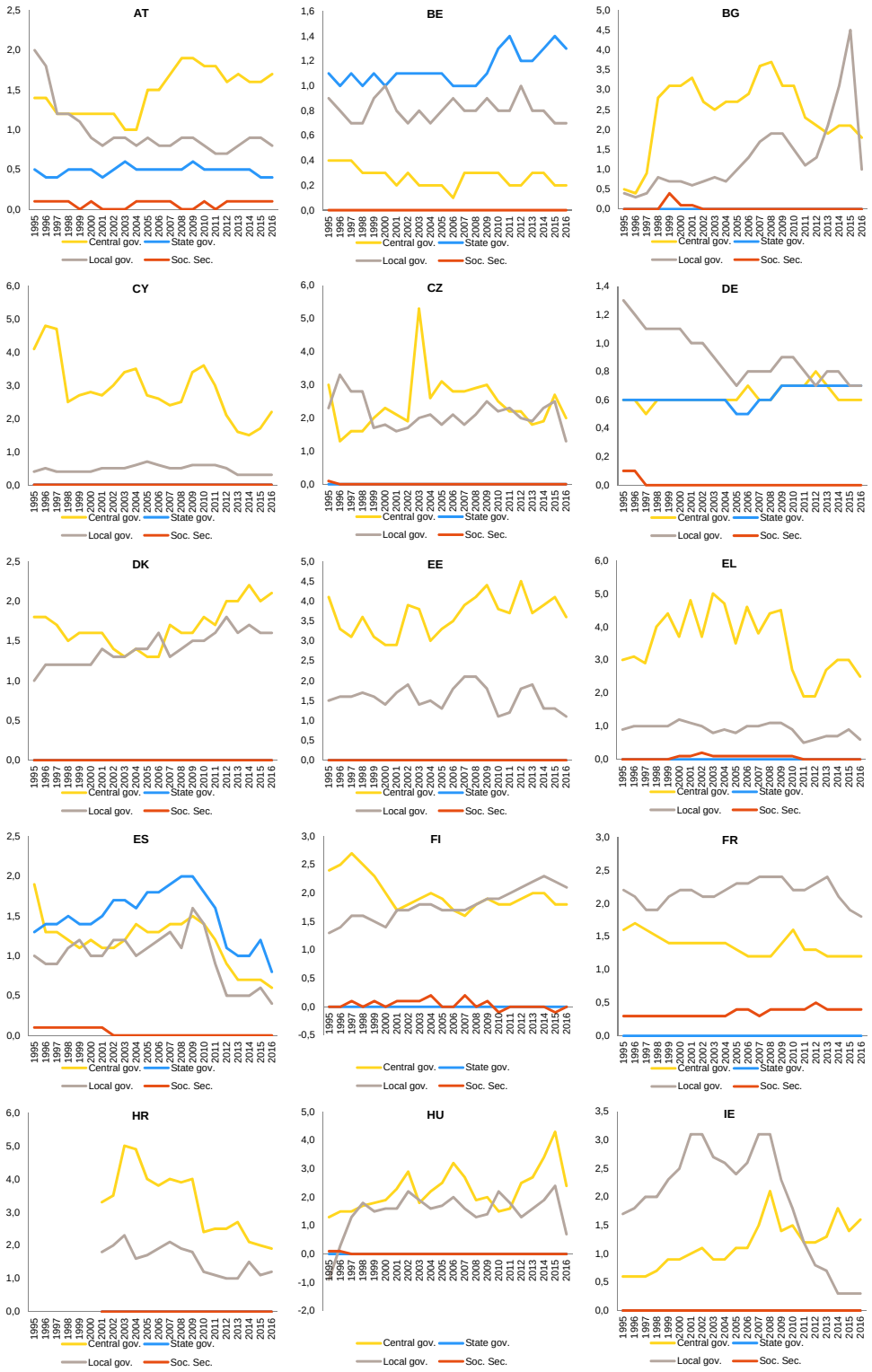
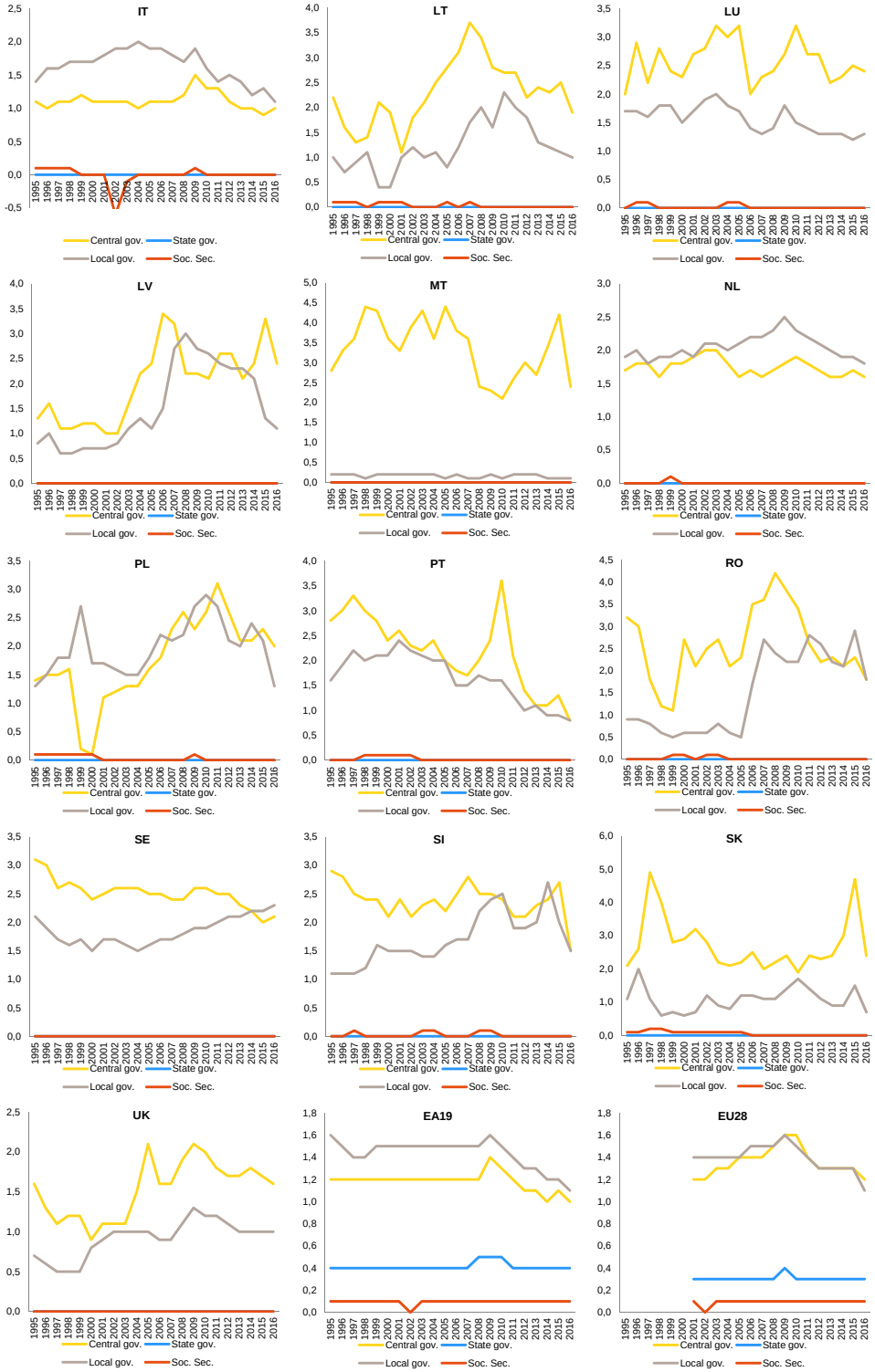
ANNEX 1

Public investment (% of GDP) by the different levels of government in the EU countries

Graph IV.A1.1: **Public investment (% of GDP) by the different levels of government in the EU countries**



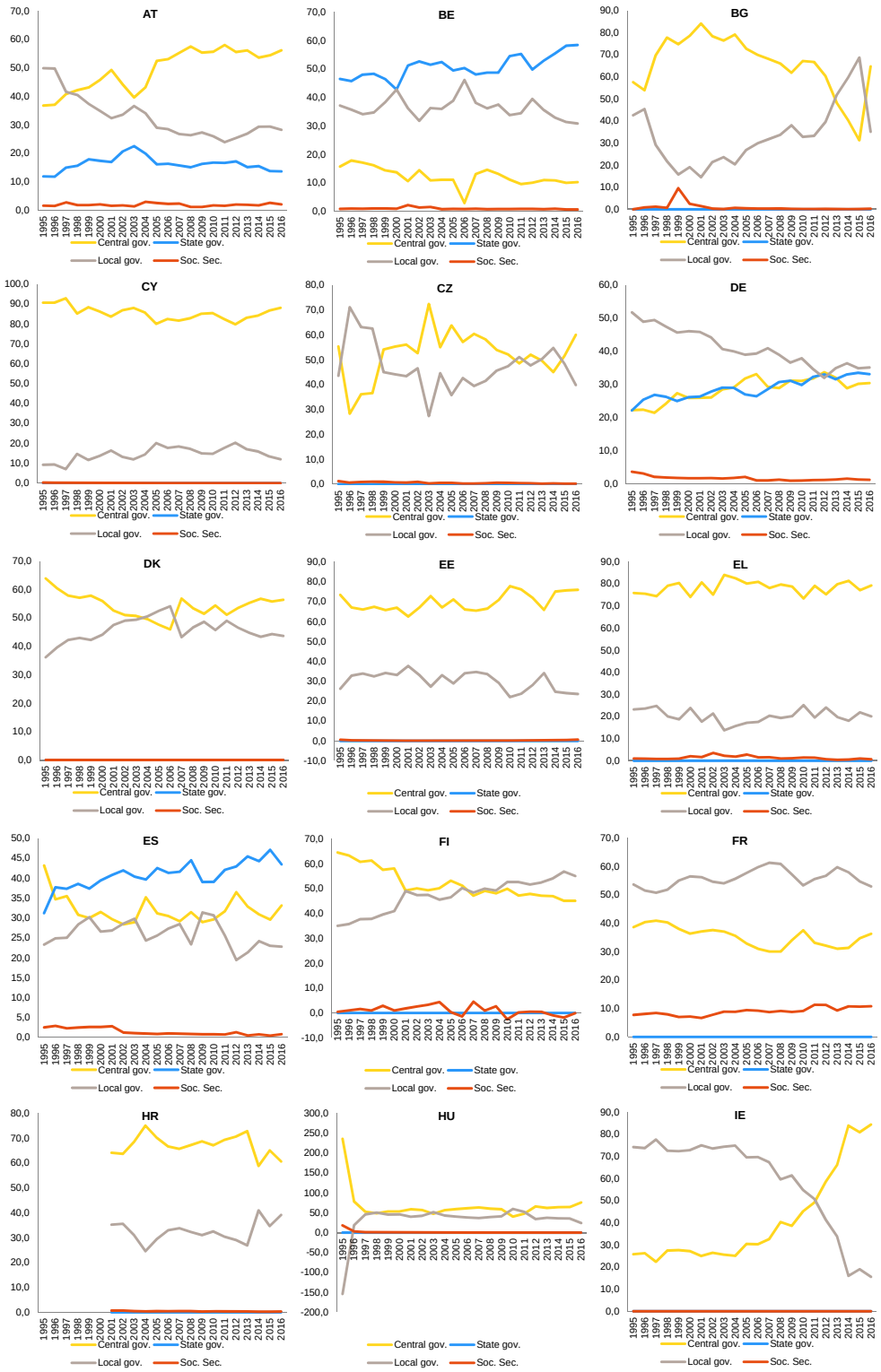


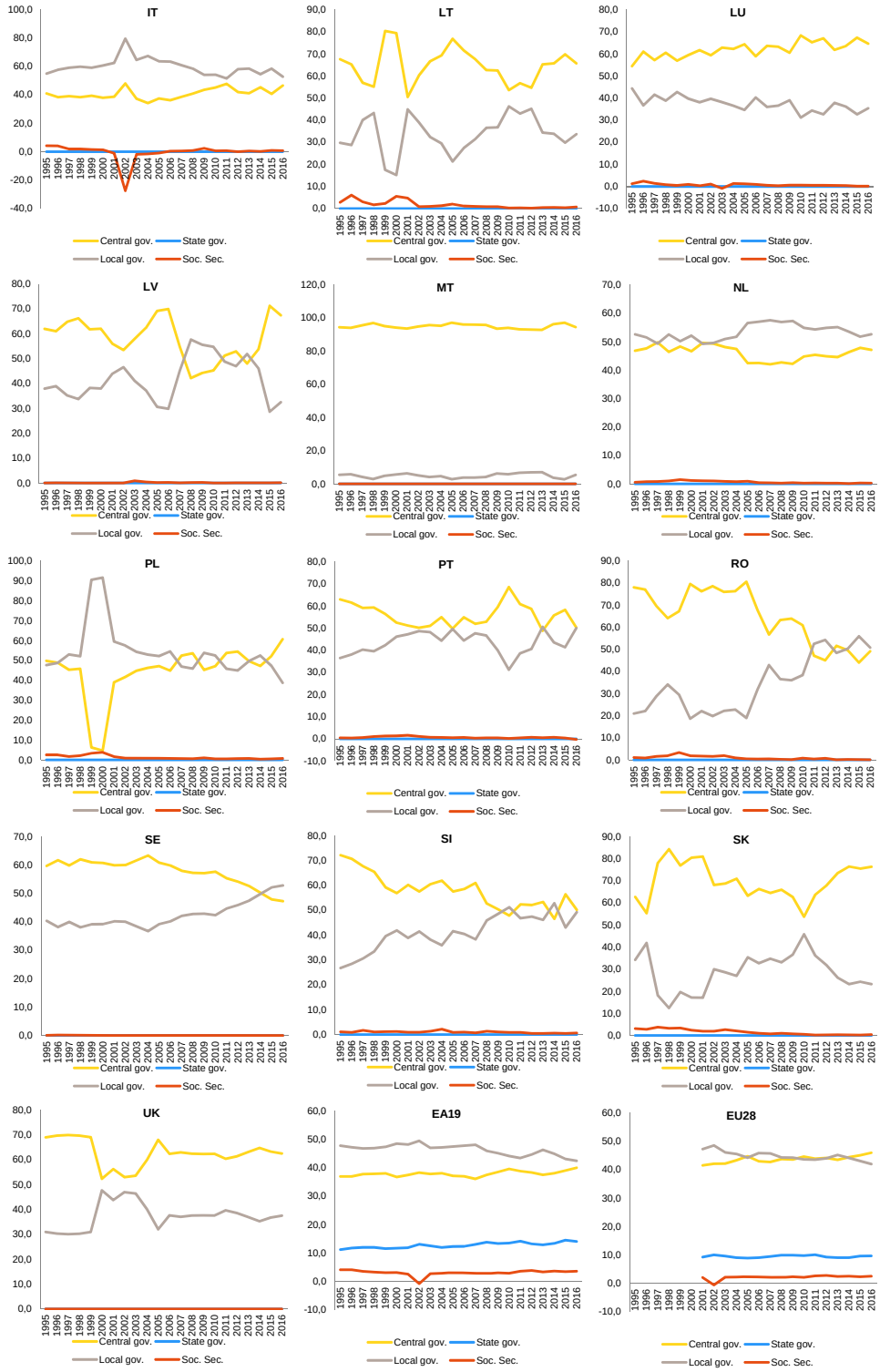
Note: State government is the federated state level where applicable, local government combines regional and municipal authorities.
Source: Eurostat.

ANNEX 2

Shares of public investment by the different levels of government in the EU countries

Graph IV.A2.1: **Shares of public investment by the different levels of government in the EU countries**





Note: State government is the federated state level where applicable, local government combines regional and municipal authorities.
Source: Eurostat.

ANNEX 3

Synoptic literature review of public investment drivers

Table IV.A3.1: **Synoptic literature review of public investment drivers**

Authors	Variables used	Method	Sample and Horizon
	Government		
De Haan, Sturm and Sikken (1996)	Lagged investment ratio Lagged investment share of total expenditure Real growth rate Growth rate of civil servants Fiscal stringency dummy Structural deficit Political cohesion index Colour of government Political stability Private investment Centralization of taxes Election year	Panel analysis	22 OECD countries for 1980–1992
Rodrik (1998)	Per capita GDP Dependency ratio in the population Urbanization rate Dummy for socialist countries Dummy for OECD members Dummies for geographical regions Ratio of trade to GDP	Panel fixed effect	Penn world countries (version 5.6a) 1985–89 1990–92
Sturm (2001)	*Structural variables degree of urbanization population growth *Economic variables real economic growth government budget deficit government debt interest payment of government private investment foreign aid openness foreign direct investment *Politico-institutional variables: Ideology electoral cycles coalition variables Economic and political freedom Political instability	Panel fixed effect	123 non-OECD countries
Galí and Perotti (2003)	Output gap General government debt to potential GDP ratio	Panel fixed effect	19 OECD countries 1980-2002
Turrini (2004)	Per-capita trend real GDP Output gap Adjusted tax revenues over trend real GDP Current expenditure over trend real GDP Debt gross of interest expenditure over trend real GDP Primary CAB over trend real GDP	Panel fixed effects	14 EU countries 1970-2002
Mehrotra and Välilä (2006)	Net lending Real GDP Long-term interest rate Public debt Net lending Current disbursement and revenues Output gap EMU dummy	Panel fixed effect Cointegration analysis	EU14 1970-2003

(Continued on the next page)

Table (continued)

Heinemann (2006)	GDP OECD Debt-GDP-level Unemployment rate OECD Output gap OECD Real interest rates Government receipts/GDP OECD Index financial market regulation Years since liberalisation of capital account transactions FDI/GDP Capital flows/GDP Openness, (imports + exports)/GDP Property income received by the government *Proxies return on investment Fertility rate Population share<14 years Government net capital stock/GDP GDP p.c. (in PPP) USD *Proxies political stability Polarization Share government seats Dropping veto players *Election cycle Years left in current term Election year *Political preferences: Dummy left leading government party Dummy right leading government party *Country groupings EU and EMU member dummies post-Maastricht dummy EMU qualification dummy	Panel fixed effect	20 OECD countries 1961-2001
Vuchelen and Caekelbergh (2010)	* Consolidation process Interest payments Deficit Primary deficit Debt *Stabilization goal Cyclically adjusted total deficit Cyclically adjusted primary deficit * Discontent of voters Expenditure gap variables	OLS	14EU countries 1972-2004
Keman (2010)	Public expenditure on investment (1980) Investment expenditure change (1980-2004) Inflation Z-scores Deficit Spending Z-scores Gross Public Debt Z-scores Change in welfare spending(1980-2004) Left policy legacy (1951-1980) Right parties in the government (1980-2004)	OLS	18 OECD 1980-2004
Bacchiocchi, Borghi and Missale (2011)	General government gross financial liabilities Real GDP growth Output gap Deficit ratio	Panel fixed effects	29 OECD countries 1990–2008
Grigoli and Mills (2014)	Institutional quality Population Leftist party Investment price relative to US GDP growth per capita (in PPP) Ongoing conflicts ODA (net disbursements as a share of GDP) Volatility of public revenues Rents from natural resources	SYS-GMM	144 countries over the period 1984–2008

(Continued on the next page)

Table (continued)

Afonso and Jalles (2015)	LHS = public and private investment (in % of GDP) Public revenue and expenditure variables by categories (controls: Real GDP per capita, age dependency ratio, labour force participation rate, and population growth)	Panel fixed effect and SYS-GMM	95 countries 1970-2008
Jäger and Schmidt (2016)	Elderly voter share Debt-to-GDP ratio Real GDP per capita Total population	Pooled D-OLS and FM-OLS	EU13 1971 - 2007
Economy			
Baldi et al (2014)	GDP per capita ppp Real growth Saving rate Employment rate Industry rate Market capitalization Loans by domestic banks to the private sectors Real effective exchange rate Inflation rate	Panel analysis	33 OECD countries 1999-2012
Regional level			
Kappeler and Välilä (2008)	LHS = GG investment for 4 COFOG functions share of tax revenue attributed to sub-national levels of government (regional and local governments) investment grants from the central government to sub-national levels of government (cap) GDP per capita Public debt and deficit Population density (ns: unemployment, birth rates, migration rates, and mortality rates)	GMM	EU10 countries (EU15 less the Cohesion countries less Luxembourg) during the period 1990–2005 (unbalanced)
Kappeler, Solé-Ollé, Stephan and Välilä (2013)	LHS = SNG investment in (1) Economic affairs (transport) (2) Redistribution (investment in housing, recreation and social protection) Tax decentralisation Capital grants GDP per capita Public debt and deficit	Corrected Least Squares Dummy Variable (LSDVC)	20 European countries over the period 1990–2009 (unbalanced)
Becker, Egger and von Ehrlich (2013)	LHS= regional investment per capita or GDP growth per capita EU funds (Objective 1) Human Capital Quality of government	Pooled OLS and panel fixed effects Regression discontinuity design (RDD) heterogeneous local average treatment effects (HLATE)	186 to 251 NUTS2 regions; EU programming periods: 1989–1993, 1994–1999, and 2000–2006
Rodriguez-Pose and Garcilazo (2013)	LHS = regional growth EU structural and cohesion policy funds with interaction term with quality of governance (controls: motorway km per capita, education, employment rate and density, GDP per capita)	two-way fixed effect panel regression model	169 European regions during the period 1996 to 2007
Crescenzi, Di Cataldo and Rodríguez-Pose (2016)	LHS = regional growth Transport infrastructure investment with interaction term with quality of governance (controls: region and year dummies, population, human capital, employment in agriculture, patents)	Panel fixed effects	166 European regions, period 1995–2009

Source: Authors' elaboration.

ANNEX 4

Additional tables to Chapter IV.3.

Table IV.A4.1: **Summary statistics**

Variable	Source	Unit	Obs	Mean	Std. Dev.	Min	Max
Fiscal variables							
Public investment	Ameco	% GDP	610	3,7	1,1	0,6	7,3
Public debt	Ameco	% GDP	609	55,4	32,3	3,7	179,7
Headline balance	Ameco	% GDP	609	-2,8	3,3	-15,1	6,9
Primary balace	Ameco	% GDP	609	-0,1	3,2	-12,5	9,6
Total revenue	Ameco	% GDP	610	42,0	6,5	27,5	58,4
Total expenditure	Ameco	% GDP	610	44,9	6,7	28,0	65,3
Macro control variable							
Real GDP per capita	Ameco	1,000 US Dollar	588	29,6	19,9	3,8	111,1
Output gap	Ameco	in %	594	-0,2	3,2	-14,5	14,4
Long-term interert rate	Ameco	in %	533	2,4	3,0	-12,4	24,5
Pop share > 65	Ameco	% tot. population	588	15,8	2,5	10,1	22,4
Political economy control variables							
Election year	Comparative Political Data Set		560	25,0	30,8	0,0	99,5
Govt. left	Comparative Political Data Set	cabinet posts of social democr. & other left parties in % of total cabinet posts	555	21,5	19,6	0,0	65,9
Dummy variables							
EA membership		dummy (0, 1)	616	0,4	0,5	0,0	1,0
2009-12		dummy (0, 1)	616	0,2	0,4	0,0	1,0
Interaction terms							
WB governance index (interpolated)	Worldbank	Index	540	1,1	0,5	-0,3	2,0
Fiscal rules index	DG Ecfin	Index	588	0,2	1,0	-1,0	4,1

Note: The table shows the summary statistics for the sample of 28 EU countries for the time period 1995 to 2016 using annual data. The headline/primary balance for Ireland in 2010 of -32.1/-29.3% of GDP is considered to be an outlier and dropped from the whole regression analysis.
Source: Authors' elaboration.

Table IV.A4.2: **Correlation matrix**

	Fiscal variables	Public investment	Public debt	Primary balace	Total revenue	Total expenditure	**Macro variable**	Real GDP per capita	Output gap	L-t interert rate	Pop share > 65	**Pol. economy variabl**	Election year	Govt. left	**Dummy variables**	EA membership	2009-12	**Interaction terms**	WB governance index	Fiscal rules index
Fiscal variables																				
Public investment		1																		
Public debt		-0,36	1																	
Primary balace		-0,24	-0,03	1																
Total revenue		-0,09	0,32	0,34	1															
Total expenditure		-0,06	0,50	-0,12	0,86	1														
Macro variable																				
Real GDP per capita		-0,33	0,32	0,03	0,21	0,22		1												
Output gap		0,14	-0,31	0,34	-0,10	-0,29		-0,02	1											
Long-term interert rate		-0,17	0,33	-0,23	0,06	0,26		0,00	-0,55	1										
Pop share > 65		0,02	0,39	0,05	0,37	0,35		0,37	-0,16	-0,05	1									
Pol. economy variables																				
Election year		0,08	-0,03	-0,06	-0,03	0,01		-0,03	0,04	0,00	0,01		1							
Govt. left		-0,11	0,09	0,08	0,12	0,13		0,09	0,03	0,09	0,04		-0,01	1						
Dummy variables																				
EA membership		-0,16	0,39	0,03	0,21	0,18		0,27	-0,07	-0,04	0,28		-0,01	0,01		1				
2009-12		0,10	0,10	-0,43	-0,01	0,16		0,02	-0,37	0,21	0,20		0,05	-0,18		0,16	1			
Interaction terms																				
WB governance index (interpol.)		-0,19	-0,05	0,33	0,51	0,31		0,21	0,09	-0,11	-0,07		-0,03	0,06		0,29	-0,01		1	
Fiscal rules index		-0,09	0,04	0,11	0,19	0,06		0,28	-0,16	-0,12	0,42		-0,06	0,02		0,19	0,04		0,16	1

Note: The table shows the correlation matrix for the sample of 28 EU countries for the time period 1995 to 2016 using annual data. The headline/primary balance for Ireland in 2010 of -32.1/-29.3% of GDP is considered to be an outlier and dropped from the whole regression analysis.
Source: Authors' elaboration.

Part V

Resources

1. ABBREVIATIONS AND SYMBOLS USED

Member States

BE	Belgium	HU	Hungary
BG	Bulgaria	MT	Malta
HR	Croatia	NL	The Netherlands
CZ	Czech Republic	AT	Austria
DK	Denmark	PL	Poland
DE	Germany	PT	Portugal
EE	Estonia	RO	Romania
EL	Greece	SI	Slovenia
ES	Spain	SK	Slovakia
FR	France	FI	Finland
IE	Ireland	SE	Sweden
IT	Italy	UK	United Kingdom
CY	Cyprus	EA	Euro area
LV	Latvia	EU	European Union
LT	Lithuania	EU-28	European Union, 28 Member States
LU	Luxembourg	EA-19	Euro Area, 19 Member States

Other

AMECO	Macro-economic database of the European Commission
AWG	Ageing Working Group
CAB	Cyclically Adjusted Budget Balance
CAPB	Cyclically-adjusted primary balance
COFOG	Classification of the functions of government
COM	Commission
CSR	Country-Specific Recommendations
DBP	Draft Budgetary Plan
DFE	Discretionary Fiscal Effort
DG ECFIN	Directorate-General Economic and Financial Affairs
DRM	Discretionary Revenue Measures
EB	Expenditure Benchmark
EC	European Commission
ECB	European Central Bank

ECOFIN	Economic and Financial Affairs Council configuration
EDP	Excessive Deficit Procedure
EERP	European Economic Recovery Plan
EFC	Economic and Financial Committee
EFSF	European Financial Stability Facility
EMU	Economic and Monetary Union
EPC	Economic Policy Committee
ESA	European System of National and Regional Accounts
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
HICP	Harmonized Index of Consumer Prices
IMF	International Monetary Fund
MTO	Medium-Term budgetary Objective
NCPI	National Consumption Price Index
NAIRU	Non-Accelerating Inflation Rate of Unemployment
NAWRU	Non-Accelerating Wage Rate of Unemployment
OECD	Organisation of Economic Co-operation and Development
OG	Output Gap
OGWG	Output Gap Working Group
PFR	Public Finance Report
Pp(s)	Percentage Point(s)
R&D	Research and development
SB	Structural Balance
SCPs	Stability and Convergence Programmes
SDP	Significant Deviation Procedure
SGP	Stability and Growth Pact
SPB	Structural primary balance
TSCG	Treaty on Stability Coordination and Governance
TFEU	Treaty on the Functioning of European Union (TFEU)

2. GLOSSARY

Asset management company: Public or private body aiming at restructuring, recovering or disposing of nonperforming assets.

Automatic stabilisers: Features of the tax and spending regime which react automatically to the economic cycle and reduce its fluctuations. As a result, the budget balance in per cent of GDP tends to improve in years of high growth, and deteriorate during economic slowdowns.

Budget balance: The balance between total public expenditure and revenue in a specific year, with a positive balance indicating a surplus and a negative balance indicating a deficit. For the monitoring of Member State budgetary positions, the EU uses general government aggregates. See also structural budget balance, primary budget balance, and primary structural balance.

Budgetary rules: Rules and procedures through which policy-makers decide on the size and the allocation of public expenditure as well as on its financing through taxation and borrowing.

Budgetary sensitivity The variation in the budget balance in percentage of GDP brought about by a change in the output gap. In the EU, it is estimated to be 0.5 on average.

Close-to-balance: requirement A requirement contained in the "old" Stability and Growth Pact, according to which Member States should, over the medium term, achieve an overall budget balance close to balance or in surplus; was replaced by country-specific medium-term budgetary objectives in the 2005 reform of the Stability and Growth Pact.

Code of Conduct: Policy document endorsed by the ECOFIN Council of 11 October 2005 setting down the specifications on the implementation of the Stability and Growth Pact and the format and content of the stability and convergence programmes.

COFOG (Classification of the Functions of Government) A statistical nomenclature used to break down general government expenditure into its different functions including general public services, defence, public order and safety, economic affairs, environmental protection, housing and community amenities, health, recreation, culture and religion, education and social protection.

Convergence programmes: Medium-term budgetary and monetary strategies presented by Member States that have not yet adopted the euro. They are updated annually, according to the provisions of the Stability and Growth Pact. Prior to the third phase of EMU, convergence programmes were issued on a voluntary basis and used by the Commission in its assessment of the progress made in preparing for the euro. See also stability programmes.

Crowding-out effects: Offsetting effects on output due to changes in interest rates and exchange rates triggered by a loosening or tightening of fiscal policy.

Cyclical component of budget balance: That part of the change in the budget balance that follows automatically from the cyclical conditions of the economy, due to the reaction of public revenue and expenditure to changes in the output gap. See automatic stabilisers, tax smoothing and structural budget balance.

Cyclically-adjusted budget balance: See structural budget balance.

Demand and supply shocks: Disturbances that affect the economy on the demand side (e.g. changes in private consumption or exports) or on the supply side (e.g. changes in commodity prices or technological innovations). They can impact on the economy either on a temporary or permanent basis.

Direct fiscal costs (gross, net) of a financial crisis: The direct gross costs are the fiscal outlays in support of the financial sector that increase the level of public debt. They encompass, for example, recapitalisation, purchase of troubled bank assets, pay-out to depositors, liquidity support, payment when guarantees are called and subsidies. The direct net costs are the direct gross cost net of recovery payments, such as through the sale of acquired assets or returns on assets. Thus, the net direct fiscal costs reflect the permanent increase in public debt.

Direct taxes: Taxes that are levied directly on personal or corporate incomes and property.

Discretionary fiscal effort: indicator that measures the fiscal effort made by governments. It is composed by the sum of the estimated values of the discretionary revenue measures and the difference between the growth rate of an appropriate expenditure aggregate in real terms and average potential GDP growth.

Discretionary fiscal policy: Change in the budget balance and in its components under the control of government. It is usually measured as the residual of the change in the balance after the exclusion of the budgetary impact of automatic stabilisers. See also fiscal stance.

Economic and Financial Committee (EFC): Formerly the Monetary Committee, the EFC is a Committee of the Council of the European Union set up by Article 114 of the. Its main task is to prepare and discuss (ECOFIN) Council decisions with regard to economic and financial matters.

Economic Policy Committee (EPC): Group of senior government officials whose main task is to prepare discussions of the (ECOFIN) Council on structural policies. It plays an important role in the preparation of the Broad Economic Policy Guidelines, and it is active on policies related to labour markets, methods to calculate cyclically-adjusted budget balances and ageing populations.

Effective tax rate: The ratio of broad categories of tax revenue (labour income, capital income, consumption) to their respective tax bases.

Effectiveness: The same concept as efficiency except that it links input to outcomes rather than outputs.

Efficiency: Can be defined in several ways, either as the ratio of outputs to inputs or as the distance to a production possibility frontier (see also Free Disposable Hull analysis, Data Envelope analysis, stochastic frontier analysis). Cost efficiency measures the link between monetary inputs (funds) and outputs; technical efficiency measures the link between technical inputs and outputs. Output efficiency indicates by how much the output can be increased for a given input; input efficiency indicates by how much the input can be reduced for a given input.

ESA2010/ESA95/ESA79: European accounting standards for the reporting of economic data by the Member States to the EU. As of 2000, ESA95 has replaced the earlier ESA79 standard with regard to the comparison and analysis of national public finance data. ESA2010 standards entered into force in 2014 and changed the treatment of R&D expenditures into investments.

European semester: New governance architecture approved by the Member States in September 2010. It means that the EU and the euro zone will coordinate *ex ante* their budgetary and economic policies, in line with both the Stability and Growth Pact and the Europe 2020 strategy. Based on previous discussions on Commission Annual Growth Survey, each summer, the European Council and the Council of ministers will provide policy advice before Member States finalise their draft budgets.

Excessive Deficit Procedure (EDP): A procedure according to which the Commission and the Council monitor the development of national budget balances and public debt in order to assess and/or correct the risk of an excessive deficit in each Member State. Its application has been further clarified in the Stability and Growth Pact. See also stability programmes and Stability and Growth Pact.

Expenditure rules: A subset of fiscal rules that target (a subset of) public expenditure.

Fiscal consolidation: An improvement in the budget balance through measures of discretionary fiscal policy, either specified by the amount of the improvement or the period over which the improvement continues.

Fiscal decentralisation: The transfer of authority and responsibility for public functions from the central government to intermediate and local governments or to the market.

Fiscal governance: Comprises all rules, regulations and procedures that impact on how the budget and its components are being prepared. The terms fiscal governance and fiscal frameworks are used interchangeably in the report.

Fiscal impulse: The estimated effect of fiscal policy on GDP. It is not a model-free measure and it is usually calculated by simulating an econometric model. The estimates presented in the present report are obtained by using the Commission services QUEST model. See also fiscal stance.

Fiscal rule: A permanent constraint on fiscal policy, expressed in terms of a summary indicator of fiscal performance, such as the government budget deficit, borrowing, debt, or a major component thereof. See also budgetary rule, expenditure rules.

Fiscal stance: A measure of the effect of discretionary fiscal policy. In this report, it is defined as the change in the structural primary budget balance relative to the preceding period. When the change is positive (negative) the fiscal stance is said to be expansionary (restrictive).

General government: As used by the EU in its process of budgetary surveillance under the Stability and Growth Pact and the excessive deficit procedure, the general government sector covers national government, regional and local government, as well as social security funds. Public enterprises are excluded, as are transfers to and from the EU Budget.

Government budget constraint: A basic condition applying to the public finances, according to which total public expenditure in any one year must be financed by taxation, government borrowing, or changes in the monetary base. In the context of EMU, the ability of governments to finance spending through money issuance is prohibited. See also stock-flow adjustment, sustainability.

Government contingent liabilities: Obligations for the government that are subject to the realization of specific uncertain and discrete future events. For instance, the guarantees granted by governments to the debt of private corporations bonds issued by enterprise are contingent liabilities, since the government obligation to pay depend on the non-ability of the original debtor to honour its own obligations.

Government implicit liabilities: Government obligations that are very likely to arise in the future in spite of the absence of backing contracts or law. The government may have a potential future obligation as a result of legitimate expectations generated by past practice or as a result of the pressure by interest groups. Most implicit liabilities are contingent, i.e., depend upon the occurrence of uncertain future events.

Growth accounting: A technique based on a production function approach where total GDP (or national income) growth is decomposed into the various production factors and a non-explained part which is the total factor productivity change, also often termed the Solow residual.

Indirect taxation: Taxes that are levied during the production stage, and not on the income and property arising from economic production processes. Prominent examples of indirect taxation are the value added tax (VAT), excise duties, import levies, energy and other environmental taxes.

Interest burden: General government interest payments on public debt as a share of GDP.

Maastricht reference values for public debt and deficits: Respectively, a 60% general government debt-to-GDP ratio and a 3% general government deficit-to-GDP ratio. These thresholds are defined in a protocol to the Maastricht Treaty on European Union. See also Excessive Deficit Procedure.

Maturity structure of public debt: The profile of total debt in terms of when it is due to be paid back. Interest rate changes affect the budget balance directly to the extent that the general government sector has debt with a relatively short maturity structure. Long maturities reduce the sensitivity of the budget balance to changes in the prevailing interest rate. See also public debt.

Medium-term budgetary objective (MTO): According to the reformed Stability and Growth Pact, stability programmes and convergence programmes present a medium-term objective for the budgetary position. It is country-specific to take into account the diversity of economic and budgetary positions and developments as well as of fiscal risks to the sustainability of public finances, and is defined in structural terms (see structural balance).

Minimum benchmarks: The lowest value of the structural budget balance that provides a safety margin against the risk of breaching the Maastricht reference value for the deficit during normal cyclical fluctuations. The minimum benchmarks are estimated by the European Commission. They do not cater for other risks such as unexpected budgetary developments and interest rate shocks. They are a lower bound for the medium-term budgetary objectives (MTO).

One-off and temporary measures: Government transactions having a transitory budgetary effect that does not lead to a sustained change in the budgetary position. See also structural balance.

Output gap: The difference between actual output and estimated potential output at any particular point in time. See also cyclical component of budget balance.

Policy-mix: The overall stance of fiscal and monetary policy. The policy-mix may consist of various combinations of expansionary and restrictive policies, with a given fiscal stance being either supported or offset by monetary policy.

Potential GDP: The level of real GDP in a given year that is consistent with a stable rate of inflation. If actual output rises above its potential level, then constraints on capacity begin to bind and inflationary pressures build; if output falls below potential, then resources are lying idle and inflationary pressures abate. See also production function method and output gap.

Primary budget balance: The budget balance net of interest payments on general government debt.

Primary structural budget balance: The structural budget balance net of interest payments.

Pro-cyclical fiscal policy: A fiscal stance which amplifies the economic cycle by increasing the structural primary deficit during an economic upturn, or by decreasing it in a downturn. A neutral fiscal policy keeps the cyclically-adjusted budget balance unchanged over the economic cycle but lets the automatic stabilisers work. See also tax-smoothing.

Production function approach: A method to estimate the level of potential output of an economy based on available labour inputs, the capital stock and their level of efficiency. Potential output is used to estimate the output gap, a key input in the estimation of cyclical component of the budget.

Public debt: Consolidated gross debt for the general government sector. It includes the total nominal value of all debt owed by public institutions in the Member State, except that part of the debt which is owed to other public institutions in the same Member State.

Public investment: The component of total public expenditure through which governments increase and improve the stock of capital employed in the production of the goods and services they provide.

Public-private partnerships (PPP): Agreements that transfer investment projects to the private sector that traditionally have been executed or financed by the public sector. To qualify as a PPP, the project should concern a public function, involve the general government as the principal purchaser, be financed from non-public sources and engage a corporation outside the general government as the principal operator that provides significant inputs in the design and conception of the project and bears a relevant amount of the risk.

Sensitivity analysis: An econometric or statistical simulation designed to test the robustness of an estimated economic relationship or projection, given various changes in the underlying assumptions.

Significant divergence: A sizeable excess of the budget balance over the targets laid out in the stability or convergence programmes, that triggers the Early warning procedure of the Stability and Growth Pact.

Size of the public sector: Typically measured as the ratio of public expenditure to nominal GDP.

"Snow-ball" effect: The self-reinforcing effect of public debt accumulation or de-cumulation arising from a positive or negative differential between the interest rate paid on public debt and the growth rate of the national economy. See also government budget constraint.

Social security contributions (SSC): Mandatory contributions paid by employers and employees to a social insurance scheme to cover for pension, health care and other welfare provisions.

Sovereign bond spread: The difference between risk premiums imposed by financial markets on sovereign bonds for different states. Higher risk premiums can largely stem from (i) the debt service ratio, also reflecting the countries' ability to raise their taxes for a given level of GDP, (ii) the fiscal track record, (iii) expected future deficits, and (iv) the degree of risk aversion.

Stability and Growth Pact (SGP): Approved in 1997 and reformed in 2005 and 2011, the SGP clarifies the provisions of the Maastricht Treaty regarding the surveillance of Member State budgetary policies and the monitoring of budget deficits during the third phase of EMU. The SGP consists of two Council Regulations setting out legally binding provisions to be followed by the European Institutions and the Member States and two Resolutions of the European Council in Amsterdam (June 1997). See also Excessive Deficit Procedure.

Stability programmes: Medium-term budgetary strategies presented by those Member States that have already adopted the euro. They are updated annually, according to the provisions of the Stability and Growth Pact. See also Convergence programmes.

Stock-flow adjustment: The stock-flow adjustment (also known as the debt-deficit adjustment) ensures consistency between the net borrowing (flow) and the variation in the stock of gross debt. It includes the accumulation of financial assets, changes in the value of debt denominated in foreign currency, and remaining statistical adjustments.

Structural budget balance: The actual budget balance net of the cyclical component and one-off and other temporary measures. The structural balance gives a measure of the underlying trend in the budget balance. See also primary structural budget balance.

Sustainability: A combination of budget deficits and debt that ensure that the latter does not grow without bound. While conceptually intuitive, an agreed operational definition of sustainability has proven difficult to achieve.

Tax elasticity: A parameter measuring the relative change in tax revenues with respect to a relative change in GDP. The tax elasticity is an input to the budgetary sensitivity.

3. USEFUL INTERNET LINKS

European Union

European Commission	ec.europa.eu
Directorate-General for Economic and Financial Affairs	ec.europa.eu/info/business-economy-euro_en
Eurostat	epp.eurostat.ec.europa.eu
European Council	consilium.europa.eu
European Parliament	www.europarl.europa.eu

Economics and Finance Ministries

Belgium	www.treasury.fgov.be/interthes	Ministère des Finances - Ministerie van Financen
Bulgaria	www.minfin.bg	Ministry of Finance
Croatia	www.mfin.hr	Ministry of Finance
Czech Republic	www.mfcr.cz	Ministry of Finance
Denmark	www.fm.dk	Ministry of Finance
Germany	www.bundesfinanzministerium.de	Bundesministerium der Finanzen
Estonia	www.fin.ee	Ministry of Finance
Ireland	www.irlgov.ie/finance	Department of Finance
Greece	www.mnec.gr/en/	Ministry of Economy and Finance
Spain	www.mineco.es/	Ministerio de Economía y Hacienda
France	www.finances.gouv.fr	Ministère Économie, Finances et l'Industrie
Italy	www.tesoro.it	Ministero dell'Economia e delle Finanze
Cyprus	www.mof.gov.cy	Ministry of Finance
Latvia	www.fm.gov.lv	Ministry of Finance
Lithuania	www.finmin.lt	Ministry of Finance
Luxembourg	www.etat.lu/FI	Ministère des Finances
Hungary	www.p-m.hu	Ministry of Finance
Malta	finance.gov.mt	Ministry of Finance and Economic Affairs
Netherlands	www.minfin.nl	Ministerie van Financien
Austria	www.bmf.gv.at	Bundesministerium für Finanzen
Poland	www.mofnet.gov.pl	Ministry of Finance
Portugal	www.min-financas.pt	Ministério das Finanças
Romania	www.mfinante.ro	Ministry of Finance
Slovenia	www.gov.si/mf	Ministry of Finance

Slovak Republic	www.finance.gov.sk	Ministry of Finance
Finland	www.vn.fi/vm	Ministry of Finance
Sweden	finans.regeringen.se	Finansdepartementet
United Kingdom	www.hm-treasury.gov.uk	Her Majesty's Treasury

Independent Fiscal Institutions

Belgium	http://www.plan.be/	Federaal Planbureau/Bureau Fédéral du Plan (Belgian Federal Planning Bureau)
	http://www.docufin.fgov.be/intersalgfr/hrfcsf/onzedienst/onzedienst.htm	Hoge Raad van Financiën/Conseil Supérieur des Finances (Belgian High Council of Finance)
Bulgaria		
Croatia	http://www.mfin.hr/en/fiscal-policy-committee	Odbor za fiskalnu politiku (Croatian Fiscal Policy Committee)
Czech Republic		
Denmark	http://www.dors.dk/	De Økonomiske Råd (Danish Economic Councils)
Germany	http://www.stabilitaetsrat.de/DE/Beirat/Beirat_node.html	Unabhängiger Beirat des Stabilitätsrates (German Independent Fiscal Advisory Council to the Stability Council)
Estonia	http://www.eelarvenoukogu.ee/en	Eelarvenõukogu (Estonian Fiscal Council)
Ireland	http://www.fiscalcouncil.ie/	Irish Fiscal Advisory Council (IFAC)
Greece	http://www.pbo.gr/	Greek Parliamentary Budget Office
Spain	http://www.airef.es/	Autoridad Independiente de Responsabilidad Fiscal (AIReF)
France	http://www.hcfp.fr/	Haut Conseil des Finances Publiques (French High Council of Public Finance)
Italy	http://www.parlamento.it/1122	Ufficio Parlamentare di Bilancio (Italian Parliamentary Budget Office)
Cyprus	www.fiscalcouncil.gov.cy	Fiscal Council of Cyprus
Latvia	www.fiscalcouncil.lv	Fiskālās disciplīnas padome (Latvian Fiscal Discipline Council)
Lithuania	www.vkontrole.lt	Lietuvos Respublikos Valstybes Kontrole (National Audit Office of Lithuania)
Luxembourg	www.statec.public.lu	National Statistical Office (STATEC, Luxembourg)
		Conseil National des Finances Publiques (CNPF, Luxembourg)
Hungary	http://www.parlament.hu/kt/tagok.htm	Költségvetési Tanács (Hungarian Fiscal Council)

Malta		
Netherlands	www.raadvanstate.nl	Raad van State (Dutch Council of State)
	www.cpb.nl	Centraal Planbureau (Netherlands Bureau for Economic Policy Analysis)
Austria	http://www.fiskalrat.at/	Fiskalrat (Austrian Fiscal Advisory Council)
	http://www.wifo.ac.at/	Österreichisches Institut für Wirtschaftforschung (WIFO - Austrian Institute for Economic Research)
Poland		
Portugal	http://www.cfp.pt/	Conselho das Finanças Publicas (Portuguese Public Finance Council)
Romania	http://www.consiliulfiscal.ro/	Consiliul Fiscal (Romanian Fiscal Council)
Slovenia	http://www.umar.gov.si/	Urad RS Slovenije za makroekonomske analize in razvoj (Slovenian Institute of Macroeconomic Analysis and Development -IMAD)
Slovak Republic	http://www.rozpoctovarada.sk/	Rada pre rozpočtovú zodpovednosť (Slovak Council for Fiscal Responsibility)
Finland	www.vtv.fi/	Valtiontalouden Tarkastusvirasto (Finnish National Audit Office)
Sweden	http://www.finanspolitiskaradet.com/	Finanspolitiska Rådet (Swedish Fiscal Policy Council)
United Kingdom	http://budgetresponsibility.org.uk/	Office for Budget Responsibility (OBR)

Central banks

European Union	www.ecb.int	European Central Bank
Belgium	www.nbb.be	Banque Nationale de Belgique / Nationale Bank van België
Bulgaria	www.bnb.bg	Bulgarian National Bank
Croatia	www.hnb.hr	Croatian National Bank
Czech Republic	www.cnb.cz	Czech National Bank
Denmark	www.nationalbanken.dk	Danmarks Nationalbank
Germany	www.bundesbank.de	Deutsche Bundesbank
Estonia	www.eestipank.info	Eesti Pank
Ireland	www.centralbank.ie	Central Bank of Ireland
Greece	www.bankofgreece.gr	Bank of Greece
Spain	www.bde.es	Banco de España

France	www.banque-france.fr	Banque de France
Italy	www.bancaditalia.it	Banca d'Italia
Cyprus	www.centralbank.gov.cy	Central Bank of Cyprus
Latvia	www.bank.lv	Bank of Latvia
Lithuania	www.lb.lt	Lietuvos Bankas
Luxembourg	www.bcl.lu	Banque Centrale du Luxembourg
Hungary	www.mnb.hu	National Bank of Hungary
Malta	www.centralbankmalta.com	Central Bank of Malta
Netherlands	www.dnb.nl	De Nederlandsche Bank
Austria	www.oenb.at	Oestereichische Nationalbank
Poland	www.nbp.pl	Narodowy Bank Polski
Portugal	www.bportugal.pt	Banco de Portugal
Romania	www.bnro.ro	National Bank of Romania
Slovenia	www.bsi.si	Bank of Slovenia
Slovak Republic	www.nbs.sk	National Bank of Slovakia
Finland	www.bof.fi	Suomen Pankki
Sweden	www.riksbank.com	Sveriges Riksbank
United Kingdom	www.bankofengland.co.uk	Bank of England

EU fiscal surveillance framework

Stability and Growth Pact:

http://ec.europa.eu/economy_finance/economic_governance/sgp/index_en.htm

Draft Budgetary Plans:

http://ec.europa.eu/economy_finance/economic_governance/sgp/budgetary_plans/index_en.htm

Excessive deficit procedure:

http://ec.europa.eu/economy_finance/economic_governance/sgp/corrective_arm/index_en.htm

Stability and convergence programmes:

http://ec.europa.eu/economy_finance/economic_governance/sgp/convergence/index_en.htm

Sustainability of public finances:

http://ec.europa.eu/economy_finance/articles/eu_economic_situation/article15994_en.htm

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  (the main reports, e.g. Economic Forecasts)
- http://ec.europa.eu/economy_finance/publications/occasional_paper/index_en.htm
  (the Occasional Papers)
- http://ec.europa.eu/economy_finance/publications/qr_euro_area/index_en.htm
  (the Quarterly Reports on the Euro Area)

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Open data from the EU
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