The macroeconomic and fiscal path in Greece during the economic adjustment programmes: 2010-2018

August 2020

Authors:

Cyrille Lenoël   (NIESR)
Corrado Macchiarelli (NIESR)
Garry Young   (NIESR)

With inputs from Cinzia Alcidi (CEPS) and Angela Capolongo (CEPS)

ABSTRACT

At the beginning of 2010, the fiscal situation of Greece was unsustainable, and an ambitious but costly adjustment plan had to be put in place. It took three consecutive adjustment programmes, including debt relief, to restore confidence in the economy and to achieve a budget surplus. The cost of the adjustment in terms of GDP loss and other economic measures like unemployment was much larger than expected. In this report, we analyse the macroeconomic and fiscal impact of the adjustment on the Greek economy to draw some lessons.

We first consider whether the programmes could have been adjusted to reduce their social cost. We observe that putting more focus on cutting public consumption rather than public investment and lengthening the adjustment period might have produced better results, but our assessment is that any improvement would have been marginal because the adjustment required was very large and would have to have come at some stage.

We find that what would have made the biggest difference is if the risk premium on Greek government debt had not risen. A more moderate increase in the risk premium would have resulted in a smaller loss in GDP and limited the increase in debt to GDP ratio. It is difficult to say exactly what the authorities could have done to prevent an increase in risk spreads, but better communication and coordination would probably have helped restore confidence earlier. An earlier debt restructuring would also have helped restore confidence but it would have been at the expense of lenders in other countries.

Supply-side reforms did seem to be effective in reducing wages and so setting up the conditions for production to pivot towards exports. But rather than prices falling, margins rose and exports did not expand as was hoped.

Table of contents

LIST OF FIGURES

LIST OF TABLES

LIST OF BOXES

EXECUTIVE SUMMARY

- After losing financial market access at the beginning of 2010, the Greek government requested international financial assistance. The fiscal situation was unsustainable, and an ambitious but also costly adjustment plan had to be put in place. It took three consecutive adjustment programmes, including debt relief, to restore confidence in the economy and to achieve a budget surplus.

- The cost of the adjustment in terms of GDP loss and other economic measures like unemployment was much larger than expected. But the only possible alternatives to an official programme were likely to have been disorderly and almost certain to have resulted in the economic performance of Greece being significantly worse and with even higher social cost than the actual experience.

- In this report, we analyse the macroeconomic and fiscal impact of the adjustment on the Greek economy. Our study uses new empirical analysis of price and wage adjustment, macroeconomic model simulations, and stakeholder engagement through focused interviews and a stakeholder workshop.

- The reduction in public investment turned out to be much larger and more persistent than planned. Public investment was reduced by about 2 per cent of GDP during 2010-2011. This is a substantial difference compared with the first and second adjustment programmes that called for a reduction of only about 0.2 per cent of public investment. Public investment possibly served as an adjustment variable to improve the budget balance more rapidly, as the government was faced with political pressure to prevent the level of public consumption from decreasing unnecessarily. This was confirmed in our stakeholders' interviews, as well as previous analyses which noted that the government found it easier to cut investment in infrastructures than to cut wages or pensions immediately.

- Based on our first simulation about the demand-side and supply-side effects of a decrease in public investment, we argue that it was economically ill-advised to reduce public investment given its impact on the long-term prosperity of the country. In

retrospect, the adjustment programmes should have included measures to ring-fence public investment.

- A large part of the fall in GDP and the accompanying increase in debt-to-GDP can be explained by the loss of confidence in the Greek economy. It took about ten years for households and businesses to go back to the confidence levels observed before the first programme. If the authorities had managed to restore confidence earlier, as their counterparts did with programmes in other EU countries, the risk premium might have been lower. Our simulation shows that Greek GDP would have been up to 7 per cent higher and the ratio of debt-to-GDP would have been lower by close to 25 percentage points if the Greek risk premium had stayed at the already high level of Portugal, the country with the second-highest risk premium in the euro area at the time. This would have moderated the fall in investment and the economy's capacity.

- Several measures could have helped to shape expectations towards a more favourable equilibrium. One is an earlier debt restructuring. Another is an earlier intervention by the European Central Bank to calm markets by promising to "do whatever it takes" and ensuring that the survival of the Euro was not in question. It would also have been helpful for there to have been a more united front between Greek and European institutions that the plan to restore debt sustainability would be implemented in full and without delay.

- We do not find any compelling evidence that a longer adjustment path would have improved the trade-off between GDP growth and fiscal consolidation. We observe that fiscal consolidation mostly occurred at a regular pace between 2010 and 2016. In a counterfactual of a longer adjustment path, we do not find that the severity of the recession would have been significantly reduced. This is because the fiscal multiplier was probably not higher in 2010 than in the later years and the scale of the adjustment required meant that the consolidation had to start at a good pace from day one.

- Looking at labour markets, nominal wage growth consistently adjusted to economic performance particularly since 2010, in

response to the Programme negotiations. In 2012 Greek ministers agreed on deep cuts to the minimum wage in return for the second rescue package, imposing nominal reductions on the standard minimum monthly wages and public-sector wage freezes conditional on unemployment falling by more than half (from 25 per cent to 10 per cent). Such interventions reduced labour market nominal rigidities which would have otherwise prevented a fuller wage adjustment, particularly if looked in the perspective of previous recession episodes. Panel estimation results also suggest that Greek wage adjustment tended to behave differently from the average wage reaction in other adjustment programmes post-2010.

- We find that Employment Protection Legislation (EPL) reforms had little to none marginal negative impact on output and productivity in the Programme countries, as these countries were already in recession. Wages and employment did react significantly following EPL changes in regular and part-time contracts. By contrast, estimates suggest that both employment and labour productivity increased after product market reforms (PMR). Using discrete changes in PMR, as recorded by the OECD, also suggests that deregulation efforts have been successful in prompting wages (downwards-) and employment (upwards-) adjustments – albeit these results should be taken with care as there is no clear-cut evidence on their statistical significance across the different indicators employed.

- Looking at the behaviour of wages in Greece over time, we find that, not only the efficiency of the labour market has changed after 2012, but also – based on our previous results – that the austerity measures impacted wages and employment by a similar degree. On the contrary, inflation expectations did not seem to be a key driver of nominal wage developments in Greece. In the light of the labour market adjustment, margins rose and exports did not expand as was hoped.

- The results paint a mixed picture which calls for a deeper reflection of the Greek experience. While across the three programmes progress has been uneven (see also Alcidi and Capolongo (2020) on the same issue), the results of this exercise

suggest that at the macro-level both the fiscal and the labour market adjustments were achieved. This, however, came at a high social cost and at the expense of some key areas, such as government investment, hence putting at risk confidence and the economy's long-run potential. The exercise also suggests there were errors in judgement in overlooking some structural/long term issues, such as the size of the tradable sector in Greece – besides the magnitude of the multipliers – thereby impeding a quicker GDP pick-up. We speculate that had international and local authorities acted in a concerted way earlier some of the macroeconomic costs would have possibly been avoided.

1. INTRODUCTION

The design and implementation of the Greek adjustment programmes constituted one of the largest economic challenges since the creation of the euro area. Ten years after the first programme, this study commissioned by the European Commission evaluates the macroeconomic and fiscal path that Greece followed in 2010-2018. We address the relevance, effectiveness, efficiency and coherence of the three adjustment programmes, and compare and contrast the experience of Greece with other euro area countries that underwent similar adjustment programmes.

There have been several questions about the restructuring process in Greece. Were the adjustment programmes well-calibrated? Was the mix of reforms aimed at consolidating the budget and reforming the economy well-thought-through? Was there enough leeway to make the programmes robust to the risk of new shocks hitting the Greek and European economies? The purpose of this study is to address some of these issues.

During the adjustment period, Greece was faced with some critical trade-offs concerning the timing of adopting several (sometimes competing) tools: (i) using labour market reforms versus fiscal consolidation, as well as (ii) using public spending reduction versus tax hikes. The critical points in calibrating an adjustment programme such as the Greek one concern the economic and financial context, the instruments available, the intended speed of the reforms and the sequencing of policy changes.

The analysis presented here first focuses on the fiscal consolidation programmes and asks whether there could have been alternative trade-offs between restoring budget balance and pushing the economy into a recession. This question is mainly answered by building on counterfactual scenarios based on the National Institute Global Econometric Model (NiGEM), where key macroeconomic factors of the adjustment programmes are altered: the length of the adjustment, the composition of public spending cuts and the interaction between fiscal consolidation and confidence. The study then evaluates how effective the labour and product market reforms were in affecting wages and prices, in particular by exploring the role of structural reforms during those years, as well as paying particular attention to the role of inflation expectations, productivity and imports.

Part of the study also entailed engaging with relevant stakeholders with direct experience of the Greece adjustment programmes and their effects, including

from institutions such as the European Stability Mechanism (ESM), the European Commission, the International Monetary Fund (IMF) and its Independent Evaluation Office, the European Central Bank (ECB), as well as representatives from the Greek local authorities and academia, both in Greece and in London (e.g. London School of Economics' Hellenic Observatory). In partnership with the Centre for European Policy Studies (CEPS), NIESR conducted an extensive representative stakeholder consultation to provide the current study with informed programme-specific feedback and context. In particular, we organized experts interviews and a stakeholder workshop to collect both qualitative and quantitative information on the facts, processes and dynamics behind the different adjustment programmes. The stakeholder workshop also provided an opportunity to qualify the different aspects of the current study and embed the results contained herein in a broader appraisal framework.

This study aims to balance a full understanding of the intervention with a retrospective judgement. At the time, many decisions were taken with uncertainty and imminent financial stability concerns, as well as a considerable number of political, economic, social or legal constraints, within the framework of the assistance programmes. The study thus attempts to determine not only whether the decisions taken on the different programmes were plausible given the available information at the time, but also which are the lessons to be learned to date.

Any judgements made on the Greek programmes in this study are based on two categories of analysis. The first one is an *evidence-based* analysis. Assessments are carried out through drawing on the scientific literature and evidence available. Public data are used, including Eurostat and Ameco, and related ECB, ESM and IMF studies, as well as information from the Greek literature, other international organisations, and the private sector and academic research. As the analysis is taking place about five years after the launch of Greece last bailout programme (2015), with some of the objectives for debt reduction still being in place, empirically, the analysis focuses more on the short-term effects. There is not yet enough data to evaluate the medium to long-term effects of the programmes with confidence.

The second category is a *model-based* analysis. An assessment of the adjustment path should quantitatively measure the action taken in conjunction with the feasible alternatives. Thus, an essential part of this study is focused on counterfactual scenarios based on the National Institute's Global

Econometric Model (NiGEM). The use of a structural macroeconomic model is appropriate in the context of an *ex-post* assessment of such an articulated programme given the extraordinary nature of the events unfolding from the 2010 sovereign debt crisis up until recently. While it is not always easy to take into consideration the impact of the political context and other unobservable or exogenous factors (e.g., confidence) as well as other complexities, the exercise allows for a much broader range of aspects to be taken into account, which can produce results that are more relevant in terms of *ex-post* analysis.

2. THE THREE ADJUSTMENT PROGRAMMES

Starting from late 2009, the Greek government quickly lost access to international market funding, as it emerged that Greece had previously underreported its budget deficit and debt stock. As a result, foreign investors lost confidence in the government's ability to withstand its obligations, and between 2010 and 2012, the 10-year bond yield on Greek government debt increased dramatically from around 5 per cent to close to 30 per cent. That corresponded also to a period during which the debt stock accelerated in Greece. The sovereign debt crisis turned into an economic recession, with GDP declining by 28 per cent from its 2007 peak, making it one of the worst episodes ever suffered by a developed economy.

The financial crisis revealed structural weaknesses in the Greek economy. As explained in Box 1, it was clear very early on that Greece's fiscal position was unsustainable without any external assistance. Greece required three multilateral bailout loans: two three-year loans agreed in 2010, 2012 from the consortium of the International Monetary Fund, the European Commission, and the European Central Bank (ECB). As the first two programmes proved insufficient to deal with the structural weaknesses of the Greek economy, in 2015, a third multilateral loan was agreed among the Hellenic authorities, the European Commission, the ECB and the European Stability Mechanism (ESM). The loans agreed over the different programmes were all granted on the condition of the Greek government adopting far-reaching demand and supply-side reforms – contained in the so-called *Memoranda of Understanding* – intended to enable the Greek government to regain access to international debt markets. The Greek government enacted several rounds of spending cuts and tax increases together with structural reforms from 2010 to 2016.

> **BOX 1 - THE OUTLOOK FOR GREECE IN THE ABSENCE OF A PROGRAMME**
>
> The purpose of this study is to assess the extent to which the three Greece adjustment programmes met their aims and whether there were alternative policy settings that might have achieved these aims at a lower cost. As part of this assessment, we compare estimated counterfactual alternatives with actual outcomes and conclude that the balance of evidence is that only slightly better outcomes could have been achieved within the same overall fiscal envelope.
>
> An alternative we do not consider in detail in this study is what might have been the economic consequences for Greece if it had not entered a programme at all in 2010. In other words, what would the no-programme counterfactual look like?

A key reason for not considering this alternative is that it is unnecessary to do so for the purposes of this exercise. We are perfectly able to assess the effect of alternative feasible policy settings against the benchmark of actual outturns and this is sufficient for assessing whether better policies were available.

Another reason for not considering the no-programme counterfactual in detail is that there is no reliable way to estimate it. The only possible alternatives to an official programme were likely to have been disorderly and almost certain to have resulted in the economic performance of Greece being significantly worse and with even higher social cost than the actual experience.

The reason for this is that it was clear by late 2009 that Greek government debt was on an unsustainable path and a radical adjustment was needed. As described in Alcidi and Capolongo (2020), market confidence in Greek government debt had been lost once vulnerabilities became apparent in an economy with a general government deficit of over 13 per cent of GDP and largely foreign-held debt of 115 per cent of GDP. Most rating agencies downgraded the sovereign and spreads increased sharply. Against this background, in the spring of 2010, the Greek government requested international financial assistance, preferring that to a no-programme alternative.

There were effectively two alternatives to an official programme such as that agreed with the European Commission, the ECB and the IMF.

First, a self-imposed fiscal consolidation that would attempt to put fiscal policy back onto a sustainable path. Second, a unilateral default by the Greek government on its sovereign debt that would have led to an immediate exit of Greece from the single currency (Grexit).

On the first of these alternatives, without confidence in the sovereign, the scale of fiscal adjustment that would have been required in a self-imposed fiscal consolidation would have been much larger than under the programme. The intention under the first programme was for the general government balance to fall from -13.6 per cent of GDP in 2009 to -2.6 per cent of GDP in 2014, a reduction of 11 percentage points of GDP over five years. But against a baseline of increasing interest expenditure and negative GDP growth where the deficit was set to grow to - 15.6 per cent of GDP by 2014, a fiscal consolidation worth 18 per cent of GDP was estimated in 2010 to be required over 2010 to 2014 (DGECFIN, 2010, para 17). This was a substantial adjustment.

But in the absence of the first programme, the Greek government would have been unable to borrow at all in 2010. Going it alone would have meant reducing its deficit to such an extent that it did not need to issue any new debt at all. With estimated gross financing needs over May 2010 to June 2013 of €193 billion, around 25 per cent of GDP over those three years, it would have needed a significant budget surplus not to have issued any new debt, whereas under the programme the deficit was planned to be 8 per cent of GDP in 2010. Achieving a budget surplus would have required much more austerity and sacrifice than under the programme. This was not a practical alternative and there was not any serious discussion of this possibility in 2010.

On the second alternative, the possible effect of Grexit has been notably analysed by Zettelmeyer et al. (2013) and Gourinchas et al (2016). But Gourinchas et al (2016) do not produce a Grexit counterfactual. They say that 'ideally one would like to analyse how the Greek economy would have performed had it left the euro and been able to depreciate its own currency. Yet this is not a counterfactual that we can easily analyse, at least without auxillary assumptions. For instance, under a 'Grexit' scenario, one needs to specify what would happen to euro-denominated liabilities'. This possibility was not discussed seriously before 2012 and is outside the scope of this study which is focused on alternative policy settings within the context of the programmes and Greece remaining within the euro area.

Most of the serious debate in 2010 was about the form of the programme, rather than whether there should be one. In particular, whether there should have been debt restructuring once Greece revealed the extent of its disastrous fiscal situation. IMF (2016) sets out the main internal debate as being whether Greece would be able to manage the crisis successfully without debt restructuring or not.

In May 2010, the first economic adjustment programme for Greece was agreed in the form of a Memorandum of Understanding (MoU) totalling EUR 110 billion. The bailout loan, with interest payments set at 5.5%, was conditional on the implementation of fiscal consolidation measures, structural reforms and the privatization of many government assets. To increase credibility, the Greek government created in July 2010 the Hellenic Statistics Authority, an independent body in charge of producing official statistics, spun off from the Ministry of Finance.

The first adjustment programme managed to improve the country's primary fiscal balance by cutting spending and increasing taxes, but at the cost of

worsening the ongoing economic recession. The sovereign debt crisis also affected several other euro area countries including Ireland and Portugal which also received emergency lending. As the Greek economy moved deeper into recession, in the context of a euro area-wide slump, the adjustment path proved unreachable and a second adjustment programme was agreed in March 2012. The new programme consisted of an extension of the maturity of the bailout loan from 7 years to 15 years and a reduction in the interest rate from 5.5 to 3.5 per cent. Private institutional investors, including banks, also agreed in March 2012 to write-off half of the Greek debt they held as part of the private sector involvement (PSI) programme to lighten Greece's overall debt burden. This programme helped prevent Greece exiting the euro area, which could have destabilized the whole euro area by laying bare the limits of an incomplete monetary union (De Grauwe, 2018). One of the objectives of the second adjustment programme was an ambitious reduction in the debt-to-GDP ratio from 160% in 2012 to 120% by 2020. Once again, the severity of the recession, fuelled by the spending cuts and the tax increases, made that objective impossible to reach within the three years.

Figure 1: Greece government bond 10-year yield
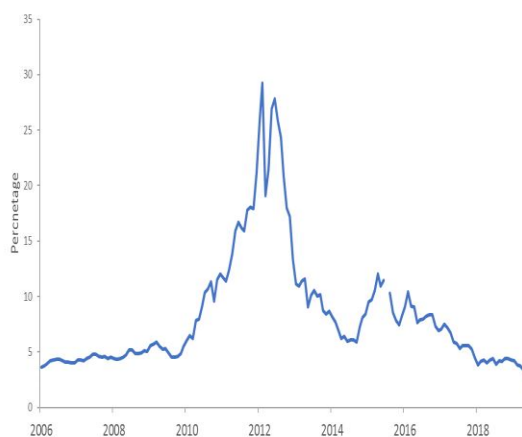
Source: Bank of Greece and NIESR

Figure 2: Greece annual GDP growth
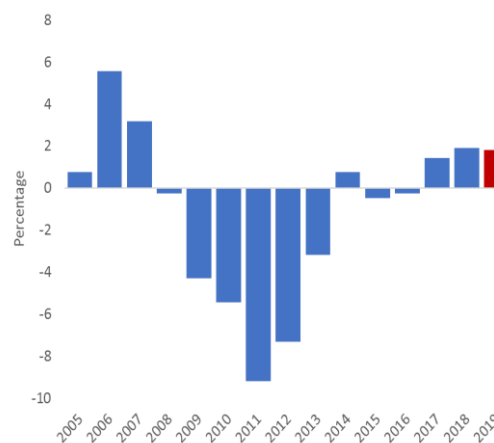
Source: Eurostat, and European Commission Autumn 2019 forecast for 2019 (in red)

Figure 3: Greece primary balance and debt to GDP

Figure 4: Greece GDP per capita as a percentage of the euro area average
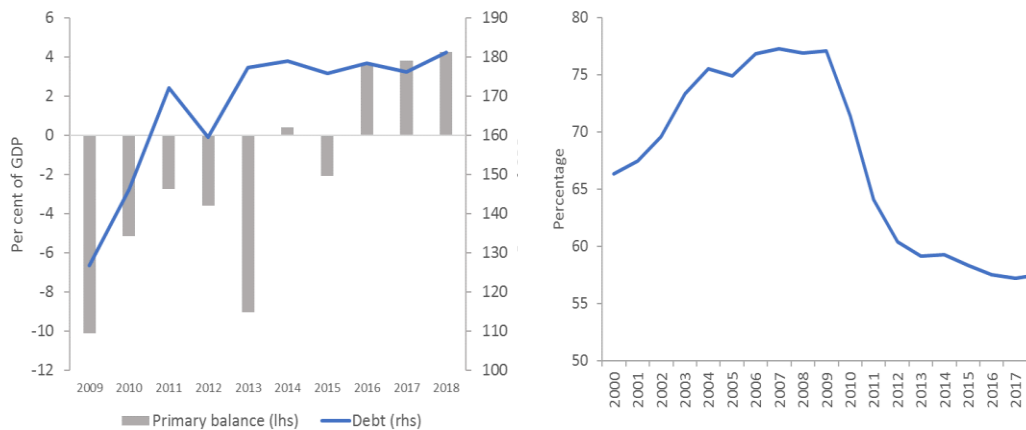
Source: European Central Bank (GFS)   Source: Eurostat and NIESR calculations

A third adjustment programme was agreed in 2015 for an amount of EUR 86 billion. The adjustment programme included a wide range of reforms, including tax, pension and justice reforms. The EU also committed to extra investment in Greece as part of the "Juncker plan". Economic growth finally started to resume in 2017 (Figure 2), as deflationary policies enacted during the previous years finally gained traction. The primary balance turned to a surplus that reached more than 4 per cent of GDP in 2018 (Figure 3). Greece was able to repay early part of its debt to the IMF in 2019 and raise funding from international debt markets at a lower cost compared to the cost of servicing debt from the IMF, ESM or, its predecessor, the European Financial Stability Facility (EFSF). However, the damage that the Greek economy suffered from the Great Recession and its follow-up sovereign debt crisis was considerable: GDP per capita declined from 77% as a percentage of the euro area average in 2009 to 57% in 2018. In addition, the debt-to-GDP ratio rose to 180% in 2018, and according to the European Commission Autumn 2019 forecast, was expected only moderately to decline to about 170% in 2020 (before the COVID-19 shock).

Figure 5: Product market regulation
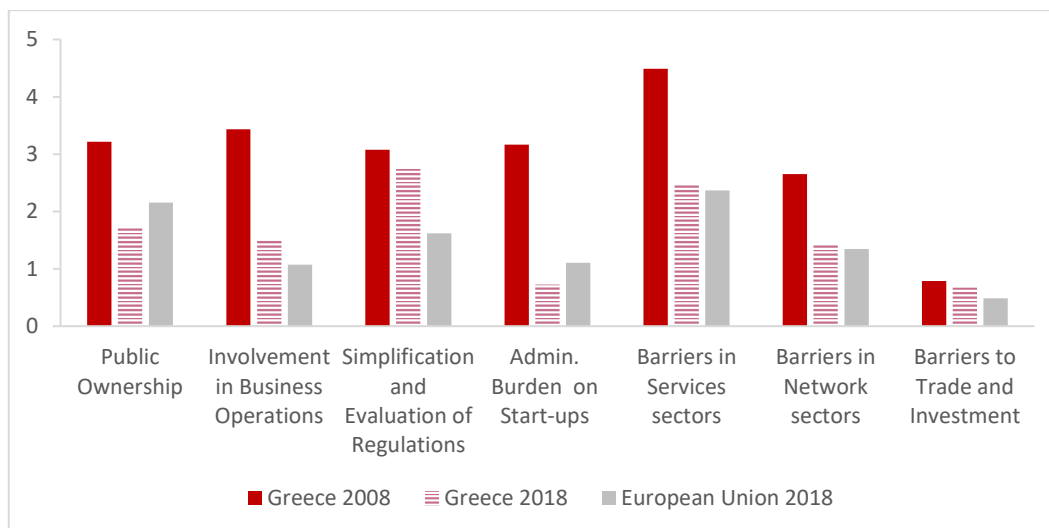
Source: OECD

The reforms implemented as part of the adjustment were successful in making the Greek economy less heavily regulated. The OECD publishes every five years measures of labour and product market flexibility to allow cross-country comparisons. Figure 5 displays the measures of product market regulation (PMR) for Greece and the average of the European Union countries in 2008 and 2018, which covers approximately the period of the Greek adjustment programmes. The lower the measures, the more business-friendly the country is. The figure shows that in 2008, Greece was a highly regulated country, but the reforms have been successful in reducing the regulatory burden to the European Union average. In 2018, Greece has even managed to reduce public ownership and administrative burden on start-ups to below the European Union average.

Having said that, the different adjustment programs in Greece had, short-term, a significant adverse effect on the country's growth prospects. The GDP dynamics ended up being worse than those initially envisaged by the European Commission over the period 2009-2013, i.e. up until the second programme (Figure 2; see also Efthimiadis et al. 2013). The question thus dominating the Greek adjustment programme debate is whether the adjustment could have been done less painfully. For this purpose, we look at the key economic issues that underpin the macroeconomic and fiscal path during an adjustment programme.

Figure 6: Real GDP growth and vintages of EC forecasts during the revisions of the first, second and third Greek Programmes
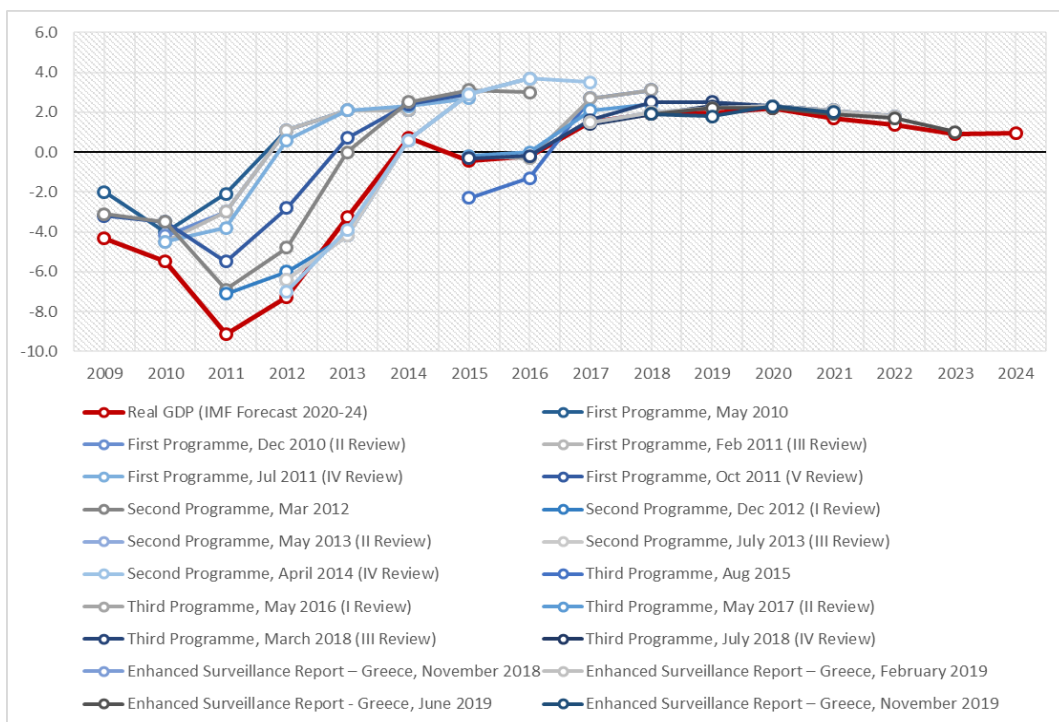
Source: European Commission (2010 through to 2019), IMF WEO and NIESR

Legend:
- Real GDP (IMF Forecast 2020-24)
- First Programme, May 2010
- First Programme, Dec 2010 (II Review)
- First Programme, Feb 2011 (III Review)
- First Programme, Jul 2011 (IV Review)
- First Programme, Oct 2011 (V Review)
- Second Programme, Mar 2012
- Second Programme, Dec 2012 (I Review)
- Second Programme, May 2013 (II Review)
- Second Programme, July 2013 (III Review)
- Second Programme, April 2014 (IV Review)
- Third Programme, Aug 2015
- Third Programme, May 2016 (I Review)
- Third Programme, May 2017 (II Review)
- Third Programme, March 2018 (III Review)
- Third Programme, July 2018 (IV Review)
- Enhanced Surveillance Report – Greece, November 2018
- Enhanced Surveillance Report – Greece, February 2019
- Enhanced Surveillance Report - Greece, June 2019
- Enhanced Surveillance Report – Greece, November 2019

3. LITERATURE REVIEW

In this section, we review the academic literature and official reports that help understand the macroeconomic and fiscal path that Greece went through in the last 10 years. We identify some empirical evidence on product and labour market reforms. We also gather evidence from the literature about fiscal policy adjustment, focusing on the changes in multipliers in time of crisis, as was relevant for Greece. This evidence review gives us some benchmarks to compare our analysis against alternative scenarios. An exhaustive review official documents, including reports from the European Commission, the IMF and the ESM has been done in a companion study by Alcidi and Capolongo (2020). These constitute an important body of information, which has been the starting point for the present study.

3.1   STRUCTURAL REFORMS

On the interplay between debt consolidation and structural reforms, Cacciatore et al. (2016) examine the consequences of labour and product market reforms in a New Keynesian small open economy model with labour market friction and entry of endogenous producers. They show that it takes time for reforms to pay off, typically a few years. They document, at the same time, that reforms, such as job protection cuts, might even temporarily increase unemployment but they might not necessarily have deflationary effects. They conclude that monetary policy's inability to deliver significant stimulus following the reforms – for instance in the case of zero lower bound or membership of a currency union, such as in Greece – may not constitute an essential obstacle for reforms either.

The response of wages and prices is, therefore, a critical factor in the study of the performance of the adjustment programmes in Greece (see Wolff, 2015). This process is called 'internal devaluation' and is described in more detail in Box 4.

Labour and product market policies played a crucial role in internal devaluation. Ioannides and Pissarides (2015) made a strong case for structural, supply-side, reform in Greece. At the same time, Gourinchas et al (2017) argued that mark-up shocks in the product market contributed significantly to the lack of Greek recovery in 2014 and 2015.

As part of its adjustment programme, Greece legislated a range of different structural reforms (OECD, 2018). These were intended to make the economy more flexible and facilitate supply-side adjustments. According to the OECD, wages fell substantially during the adjustment programme, but the impact on exports was limited. An unpublished report, co-authored by two members of

this project team, analysed the effect of the first two adjustment programmes on Greek exports (Gros et al., 2015). They found that those exports of goods and services that might benefit from an 'internal devaluation' amount to only 12% of GDP, compared to about 25% for Portugal and much higher values for most other small euro area countries. This could imply that, even if the intended adjustment in wages and prices materialized, the extent to which the economy of Greece could recover quickly was limited anyway.

Anderson et al (2014) using the IMF's Global Integrated Monetary and Fiscal Model estimated the macroeconomic impact of implementing labour and product market reforms in the Euro periphery (Greece, Ireland, Italy, Portugal, and Spain). In particular, assuming that the Euro periphery reduces half of its Product Market Regulation (PMR) gap to the OECD frontier, the authors find that the reforms would boost GDP by 4.2% in 5 years. They also find that product market reforms would increase GDP significantly more than labour market reforms or tax reforms, although there would be some positive spillover from doing all the reforms simultaneously. Such a study raises the question: since Greece has implemented such growth-friendly structural reforms, why did it go through such a large economic contraction? This may have to do with the sequencing of fiscal and labour market reforms, as well as the size of the multipliers at the time.

3.2 FISCAL MULTIPLIERS

There is a large economic literature on the interaction between fiscal policy and economic growth. The literature often uses the concept of the fiscal multiplier. The fiscal multiplier is defined as the ratio of the change in national income arising from an exogenous change in government spending or revenue plans. Multipliers are computed to evaluate the macroeconomic impact of a government stimulus or austerity plan.

The idea, originally expressed by Richard Kahn in 1931, relates to the extent which a change in government spending plans raises income for households and firms and causes them also to change their expenditure, which amplifies the impact of the original 'injection' or 'withdrawal' (Kahn, 1931).

The economic consensus on the fiscal multiplier in normal times is that it tends to be small, typically smaller than 1. This is for two reasons: first, increases in government expenditure need to be financed and thus come with a negative 'wealth effect', which crowds out consumption and decreases demand. Second, a fiscal expansion, increasing inflation and output, triggers a response by the

central banks, which raises interest rates, offsetting some of the expansionary effects of fiscal policy.

However, there are many factors which may impact the multiplier, and some of those factors were at play in the case of the Greek adjustment.

One crucial economic phenomenon that may impact multipliers is the role of expectations. Giavazzi and Pagano (1990) argued that the conventional contractionary impact of fiscal consolidation can be misleading because it neglects policy expectations: if the private sector sees fiscal consolidation as a signal that the share of government spending in GDP will continuously be reduced, households will revise their estimates of their permanent income upwards; in this sense, there could be substitution between private and public consumption. Equally, Perrotti (1999) looking at the 1980s experience of some countries found that, in many cases, private consumption boomed rather than contracted during government debt or corrective budget deficit reduction, contrary to the traditional wisdom. This would seem to go in the direction of the above, albeit Perrotti explained that it might relate to appropriately accounting for cyclical adjustment in debt. He split the analysis by "good" and "bad" times by discussing the role of credit constraints in the transmission of fiscal shocks. During bad times, he found shocks to government spending to have significant expansionary effects only in countries with high loan-to-value ratios (LTV), which is a measure of credit leverage.

There is a large literature on fiscal policy that shows that it is not just the size of the public sector that matters, but also its composition. For example, Fournier and Johannsson (2016) show that cross-country differences in the size and the composition of spending can potentially explain sizeable differences in the level and distribution of income. Governments in the OECD spend on average about 40% of GDP on the provision of public goods, services and transfers. At 47 per cent in 2018, Greek public expenditure to GDP was still higher than the OECD average, despite the considerable effort achieved in the last 10 years. The sheer size of the public sector has prompted a large amount of research on the link between the size of government and economic growth (see Bergh and Henrekson, 2011 for an overview).

Perotti (2004) says there is no evidence to suggest that tax cuts work faster or more successfully than increases in spending. Over time, the impact of government spending shocks and tax cuts on GDP and its components have become significantly weaker-especially in the post-1980 era when those effects have even become negative. In the context of a study of 9 European countries

and 47 US States, Canova and Pappa (2007) look empirically at the relation between fiscal shocks and regional price differentials in monetary unions. The fiscal multipliers they obtain for public expenditure shocks has a median of 0.8 in the EMU per annum. Such figures are comparable to those obtained by Roeger and in't Veld (2002) and to Hunt and Laxtón (2002) for Italy, France and Germany and by Kilponen et al. (2015) who employ several dynamic macroeconomic models maintained within the European System of Central Banks. In the latter, the short-run multiplier obtained for Greece is slightly above one (in absolute terms) for capital tax increases over a two-year horizon, but somewhat below 1 one for public sector expenditure, even when the zero lower bound is considered. A recent review of literature by Mineshima et al., (2013), updating Spilimberg et al.'s (2009) earlier figures shows first-year multipliers for public spending of approximately 0.8 and of roughly 0.3 for taxes. Hernadez de Cos et al. (2003), who used a variety of euro area Central Bank's models and the Areawide model of the ECB find a range of yearly output multipliers to public expenditure shocks between 0.4 and 1.4.

Reinhart and Rogoff (2010) argued that high level of debt is detrimental to growth and estimated that the effect is particularly significant when the ratio of debt to GDP is above 90 per cent, with median growth rates slipping by 1 percentage point in that case. Baum et al. (2012) updated these results using data up to 2010 to find that the debt's inhibitive level was lower pre-crisis and slightly higher during the crisis (96 per cent). Despite some evidence in this direction (Checherita and Rother, 2010; 2012; Baum *et al*., 2012), the consensus that debt creation is harmful to growth has been challenged more recently (Panizza and Presbitero, 2012; Cotarelli and Jaramillo, 2012), suggesting that the link between growth and debt may be more complex.

Blanchard and Leigh (2013a) noticed that forecasts of the recessionary impact of debt consolidation programs in Europe had been underestimated. Their results suggested that tax multipliers were between 0.9 and 1.7, much higher than previously thought, i.e. around 0.5. Several recent analytical studies have found that if the nominal interest rate is near the lower nominal boundary of zero per cent, the tax multiplier may increase by a factor of 2X or 3X.[1]

---

[1] On the other hand, however, heightened macroeconomic uncertainty may promote precautionary savings for consumers, decrease their marginal consumption's propensity and thus, reduce the size of the multiplier (see e.g. Spilimbergo et al., 2011).

An alternative method of reducing debt is to restructure it, as was done for Greek debt during the second programme. This also has macroeconomic consequences. Holland and Kirby (2011) studied the impact of debt restructuring on the debt premium. Defaulting, or restructuring enables debtor countries to reduce the size and/or lengthen the maturity of their repayments, reducing current interest liabilities, which may act as a temporary fiscal stimulus. However, there are also costs associated with default. By hurting the confidence of investors, it raises the cost and ability of defaulters to access future finance. Ozler (1993) found that defaulters were still paying a premium more than 40 years later. De Paoli, Hoggarth and Saporta (2009) identified evidence that the size of bond spreads is correlated with the magnitude of past haircuts, suggesting that a bigger default is more costly than a smaller default. They also find evidence in support of pre-emptive action, as the output costs of pre-arrears restructuring of debt tend to be smaller than those of post-arrears restructuring. Using NiGEM model, Holland and Kirby (2011) estimated that the Greek debt restructuring would lead to an expected decline in GDP of about 0.5 percentage point against the baseline within three years because of a reduction in private sector wealth and bank capital (figure 7). The loss of capital by euro area banks that held Greek government bonds would also lead to a loss of GDP of about 0.1 percentage point in the euro area within three years.

Figure 7: Impact on output of Greek debt restructuring
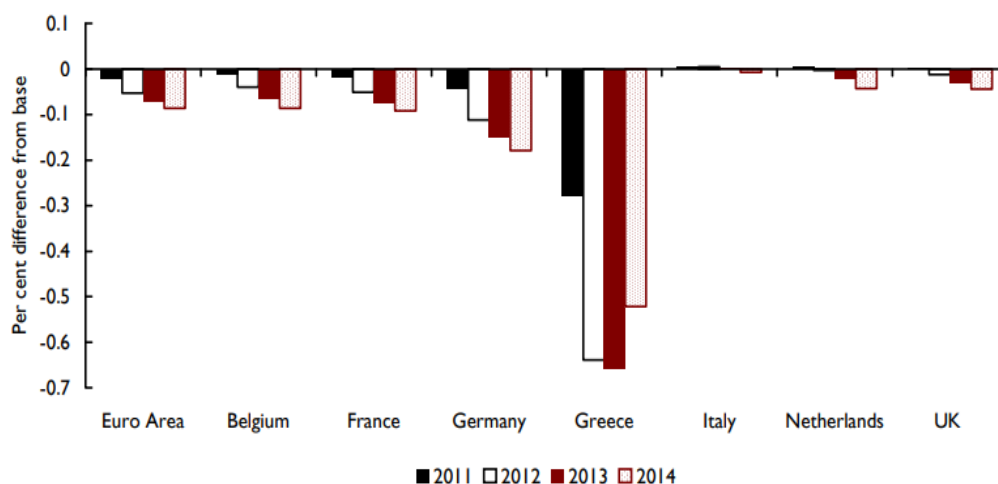
Source: Holland and Kirby (2011)

The degree of liberalization on the financial market as well as general macroeconomic conditions in the domestic economy represent other factors that may affect the fiscal multiplier. A relatively small degree of financial

intermediation generally indicates the inability of liquidity constrained households and companies to inter-temporarily smooth consumption and investment. In those instances, a fiscal stimulus will lead to higher consumption and less (precautionary) saving. In't Veld (2013) using the Commission's QUEST model with seven countries (Germany, France, Italy, Spain, Ireland, Portugal and Greece, and the remainder of the euro area as one block), under the assumption of a high share of constrained households, concluded that the impact of GDP is crucially dependent on the consolidation composition and how rapidly expectations are affected.

Table 1: Fiscal impact multipliers and factors affecting them

	Temporary spending multiplier	Temporary income tax multiplier	Import penetration	Income elasticity
Austria	−0.52	−0.13	0.50	0.23
Belgium	−0.62	−0.12	0.80	0.17
Finland	−0.61	−0.06	0.39	0.00
France	−0.67	−0.27	0.30	0.51
Germany	−0.48	−0.26	0.39	0.68
Greece	−1.35	−0.53	0.34	0.48
Ireland	−0.36	−0.08	0.72	0.17
Italy	−0.63	−0.13	0.27	0.14
Netherlands	−0.59	−0.20	0.70	0.23
Portugal	−0.73	−0.11	0.38	0.08
Spain	−0.81	−0.11	0.37	0.00
UK	−0.54	−0.09	0.29	0.17
US	−0.92	−0.19	0.16	0.15
Spending correlation			0.43	−0.12
Tax correlation			0.22	−0.73

Note: Import penetration is measured as the volume of goods and services imports as a share of GDP in 2005. Income elasticity is the estimated response of consumption to current changes in income, from the consumption equations in NiGEM.

Source: Holland and Portes (2012)

As Holland and Portes (2012) further underlined, multipliers tend to be smaller, the more open an economy is, and dependent on the elasticity of consumption on current income (Table 1). Greece, itself, presents a moderate degree of import penetration and higher current income elasticity. This may vary depending on the number of liquidity constrained consumers, which may indeed increase at the zero-lower bound (ZLB) or if the system of banking is compromised. The multiplier used by Holland and Portes (Table 1) is not far from the multiplier implicit in Gourinchas et al. (2016) and other studies on Greece – around 1.5.

Another key factor that is found to affect the multiplier is whether the economy is in a recession or not. Auerbach and Gorodnichenko (2010) and Bachmann and Sims (2011) estimated spending multipliers to be approximately zero in expansions and as high as 2 or 3 in recessions. Using statistics for Germany, Baum and Koester (2011) also considered that fiscal spending multipliers are much higher in periods of a negative output gap but only have a 'somewhat limited' effect during periods of a positive output gap. Similarly, Shoag (2010) examined trends in government spending at the state level and found that the multiplier is about 3.0-3.5 if labour markets have a slack, compared to about 1.5 if there is no slack. Batini et al. (2012) argued that the cumulative multiplier during a recession to be -2.5 and -0.4 for expenditure cut and tax hike respectively and -0.4 and 0.2 during expansions. Gechert et al. (2013) demonstrated that multipliers of general government expenditures range between 0.4 and 0.7 across the different specifications, and all differ significantly from zero. In recessions, however, they tend to be higher by 0.6 to 0.8 than the average.[2]

Batini et al. (2012) and Jorda and Taylor (2013) suggest that even when achieved during an expansionary period, consolidations can make recessions more likely. From a political point of view, this is particularly relevant for positive but mild-growth periods. Batini et al. (2012) argue that frontloading consolidations during the early stages of a crisis risk to intensify the costs of consolidation itself, thus delaying any efforts of reduction in the debt-to-GDP ratio. Such an effect can exacerbate the market sentiment, increasing calls for more fiscal austerity. Instead, a more progressive fiscal adjustment with a balanced composition of spending reductions and targeted tax increases might improve the chances of a quicker, more successful consolidation. The optimal adjustment path is, of course, arduous to find in practice.

Born et al (2019), using a small open economy model that they calibrate on Greece with downward nominal wage rigidity, find that government spending is asymmetric: a spending cut lowers output but does not alter the real effective exchange rate; a spending increase appreciates the REER but does not significantly change output unless there is slack in the economy. Empirically,

---

[2] In addition, Riera-Crichton et al (2014) suggest that the notion of automatic stabilizers may need rethinking. Contrary to what commonly thought, it is not always the case that government spending is acting countercyclically. Since the economy does not respond symmetrically to government spending increases or decreases, the "true" long-run multiplier for recessions may thus turn up to be much larger compared to expansions.

their finding implies a public expenditure and tax multiplier of about 0.7 and 1.3, respectively, in line with previous studies.

There is a consensus on both theoretical and scientific grounds that multipliers are thus time-and state-dependent, as Barrell et al. (2009) show: reported multipliers are dependent on the method of calculating them, on the business cycle (expansions and recessions) and on the countries (in particular on consumption-income elasticity and the degree of trade openness).

While the latter findings are in overall agreement with earlier Keynesian arguments in favour of using discretionary fiscal policy in recessionary periods to stimulate aggregate demand, Gechert (2015) and Cogan at al. (2009) suggested that reported multipliers depend also on the model classes employed. Real Business Cycle models (i.e. without price inertia), for instance, produce significantly lower multipliers (close to zero), compared to backwards-looking macroeconomic models which tend to report significantly higher multipliers. Dynamic Stochastic General Equilibrium-New Keynesian models produce multipliers reasonably consistent with the recent literature, with these results only applying when incorporating a ZLB problem in the models (e.g., large-scale estimated DSGE models à la Smets and Wauters (2003) would typically yield significantly lower multipliers compared to the ones obtained from any Keynesian models; see Cogan at al., 2009).

Monetary policy could in general help to alleviate some of the pain of a fiscal contraction. But this tool is not so much available in a currency union. In the case of Greece, the adjustment was attempted at a time when the euro area economy was already in recession, and when Greek's product and labour markets were not flexible enough. In the short term, the effect of sharp fiscal adjustment on aggregate demand dominated any offsetting effect from improved international competitiveness. The fiscal policy multiplier turned out to be large, causing a significant contraction in demand. The economic literature suggests that the multiplier tends to be higher during crisis periods, which makes a fiscal consolidation more costly.

Alesina et al. (2019) examined the effect of austerity policies implemented since the 1970s in sixteen advanced countries using a common framework. Despite being generally favourably disposed to fiscal consolidations efforts, the authors were critical of the fiscal actions and objectives pursued in Greece for the reasons outlined above. In the same token, Holland and Portes (2012) highlighted the potentially "self-defeating" nature of austerity measures when implemented at unpropitious times, for example, in the presence of liquidity

constrained consumers. They showed how aggressive austerity policies could lead in some cases to increases in the debt-to-GDP ratio when the level of GDP declines and that this could have a destabilising impact on sovereign yields and fiscal sustainability. Of course, austerity is not always a policy choice but may be required by the loss of market access, as was the case in Greece in 2010.

4. FISCAL AND MACROECONOMIC ANALYSIS

In this section, we study how Greek economic performance might have been different had alternative adjustment programmes been implemented. We do this by building informative counterfactuals for the Greek adjustment programmes using NiGEM. The NiGEM model is described in Box 2. The objective of the counterfactual analysis is to identify areas where the trade-off between restoring government finances and reducing the size of the economy could have been improved upon. The choice of the counterfactual scenarios is the result of our analysis of the macroeconomic and fiscal path followed by Greece since the beginning of the first adjustment programme, informed by discussions with the European Commission during this study. The scenarios are centred around a discussion of the mix between spending cuts and tax increases within the same overall programme budget and a discussion of the sequencing of reforms. The main criteria for evaluating the programme(s) and their counterfactuals are the path of GDP and the return to debt sustainability.

In calibrating our simulation exercises, the results of previous academic research have been supplemented by available publicly accessible data, reports from the Commission, the ECB and the IMF, information released by the Greek authorities and other international organisations as well as the private sector.

BOX 2 - THE NIGEM MODEL

The National Institute Global Econometric Model (NiGEM) is a multi-country macro-econometric model linked through trade in goods and services and integrated capital markets. Greece is one of the countries modelled in NiGEM, as are nearly all of the euro area countries. An overview of the model can be found in Hantzsche et al. (2018). NiGEM is particularly fitting for policy analysis because it provides the main characteristics of the main macroeconomic variables, including their dynamics while allowing for the construction of forecasts and what-if scenarios. For example, NiGEM was used to simulate the impact of the UK exiting the EU (Hantzsche, Kara and Young, 2019), to evaluate the impact of the fiscal reform package in France under President Macron (Lenoel, 2017) and to simulate the effect of Greece leaving the euro area (Suni, 2014).

NiGEM uses a 'New-Keynesian' framework in that agents are presumed to be forward-looking, but nominal rigidities slow the process of adjustment to external events. All country models contain the determinants of domestic demand, export and import volumes, prices, current accounts and net assets. In the short run, the dynamic properties of the model are consistent with the

---

data and well-determined. In the long run, output is tied down by factor inputs and technical progress, interacting through production functions. The equations are estimated in equilibrium correction form.

Households in the model are assumed to choose consumption in accordance with life-cycle considerations as a function of their current and expected future real disposable income as well as wealth from housing and financial assets, all net of taxes. In the long run, consumption depends on a dynamic adjustment path around real disposable income and real wealth. Human wealth is a forward-looking component in the consumption model and is defined as a function of the expectations of future real disposable income. The dynamics of adjustment to the long run are data-based and differ between countries to take account of differences in the relative importance of types of wealth and liquidity constraints.

Aggregate supply in the individual country models is based around an underlying constant-returns-to-scale CES production function with labour-augmenting technical progress. This is embedded within a Cobb-Douglas relationship to allow the factors of production (capital and labour) to interact with energy usage. This relationship underpins the factor demand equations in the model, forms the basis for total unit costs and provides a measure of capacity utilisation, which then feeds into the price system. The prices set by firms depend on the cost of production inputs and a mark-up over the marginal cost. Firms are assumed to choose factors to minimise the cost of production given the production function.

In the labour market, the level of real wages is determined in a bargaining process between workers and firms. The higher the unemployment, the lower is the bargaining power of workers. We assume a Phillips curve relationship between real wage growth and unemployment. Profit maximisation on behalf of firms also requires wages to move in line with productivity over time. Expectations are consistent with model predictions. Nominal rigidities in prices ensure that monetary policy has real effects.

Each country has a set of equations for the public sector. Both direct and indirect taxes depend upon their respective tax bases and on the tax rate. Corporate taxes also depend upon the corporate tax rate and the level of profits, but with lags related to the collection process. Government spending on current goods and services and investment spending depend in part on current plans, and by default rise with trend output. Transfer payments depend upon unemployment and the dependency ratio as well as on policy. Government

interest payments are determined by a perpetual inventory model based on the flow deficit and the stock of debt, with the appropriate structure of short and long-term interest payments on the debt stock.

The wealth and accumulation system allow for flows of saving onto wealth and for revaluations of existing stocks of assets in line with their prices determined as above. In the medium term, personal sector liabilities are assumed to rise in line with nominal personal incomes, and if there are no revaluations, gross financial wealth will increase by the nominal value of net private sector saving plus the net increase in nominal liabilities.

Greek monetary policy in the model is tied to the ECB and can thus be considered as exogenous because it only responds to euro area aggregate shocks.

4.1 ALTERNATIVE SCENARIOS OF FISCAL CONSOLIDATION

The first adjustment programme had planned for a large but necessary fiscal consolidation amounting to 13 per cent of GDP in 5 years, compared to the baseline of no adjustment programme[3]. Figure 8 shows the evolution of the budget balance according to the baseline, the plan and the actual path. It is possible to see that the planned first-year consolidation did not occur, as the deficit was 11%, very close to the baseline scenario. However, in the following years, a very aggressive consolidation was implemented. It was only in the year 2013 that the fiscal consolidation was missed. At the end of the programme, in 2014, the budget balance was at -3.6 per cent of GDP, quite close to the planned -2.6 per cent. In that regard, one can consider that the consolidation was successfully implemented according to plan.

Greece had at the start of the adjustment a very large public sector and one of the objectives of the adjustment was to decrease its size. The ratio of public expenditure to GDP declined from the 4th highest in the OECD in 2009 at 54 per cent to the 9th highest in 2018 at 47 per cent, equivalent to an 'effort' of 7 per cent of GDP. Naturally, it is not just the size of the public sector that matters but also the efficiency of public spending (see also Fournier and Johansson,

---

[3] The baseline of no adjustment programme is described in European Commission (2010a). It is a theoretical scenario that assumes no fiscal consolidation and doesn't address the problem of how the required funding is obtained. We discuss this baseline in Box 1.

2016). While it is difficult to measure the efficiency of public spending – and how much progress the Greek government made with external help – it can be argued that a government's efficiency may be negatively correlated with its size. Reductions in the size of the state are normally expected to have long-term benefits on the economy by freeing resources to the more productive private sector. For example, Bergh and Henrekson (2011) in a survey of the empirical literature concluded that a decrease in government size by 10 percentage points is generally associated with an increase of 0.5 to 1 per cent of economic growth.

Figure 8: Greece budget balance to GDP during the first adjustment programme
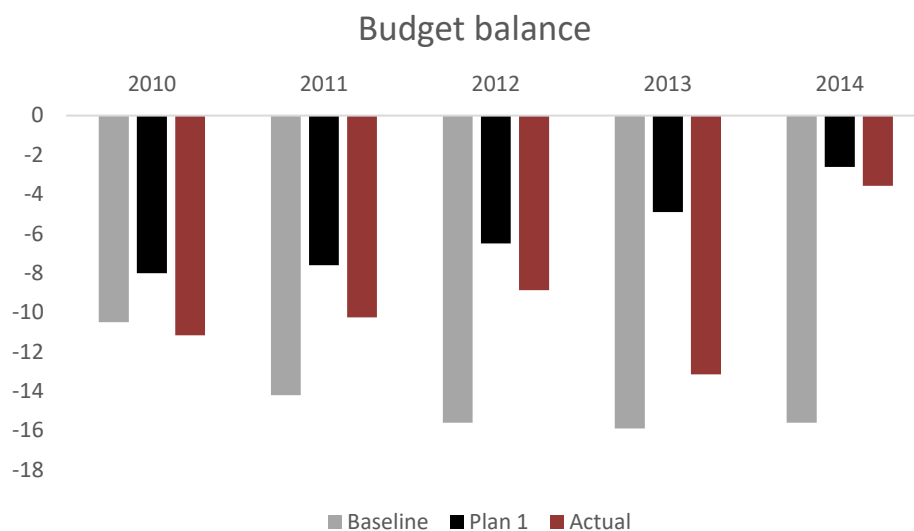
Source: NIESR

The adjustment programme was initially heavily geared towards spending cuts rather than tax increases. The total effort in the first programme between 2010 and 2014 was 13 per cent, split between 4.8 per cent for revenue measures and 8.1 per cent for expenditure measures.[4] Figure 9 shows that over 9 years from 2009 to 2018, government expenditures were reduced by EUR 38 billion, whereas revenues stayed essentially flat.

Because GDP declined in the meantime, this meant that there was still an effort to collect more revenues as government revenues to GDP increased by 10

---

[4] See note in Figure 10 for the details of the calculation

percentage points from 38 to 48 per cent. Looking at the year-by-year variations and how revenues and expenditures changed as a percentage of GDP compared to 2009, figure 10 shows that revenues increased much more as a share of GDP than the corresponding decrease in expenditure. Overall, this paints a mixed picture of a plan that initially focused more on the expenditure side, but as the economic background worsened, it turned out making an even larger effort on revenues.

Figure 9: Greece general government expenditure and revenues
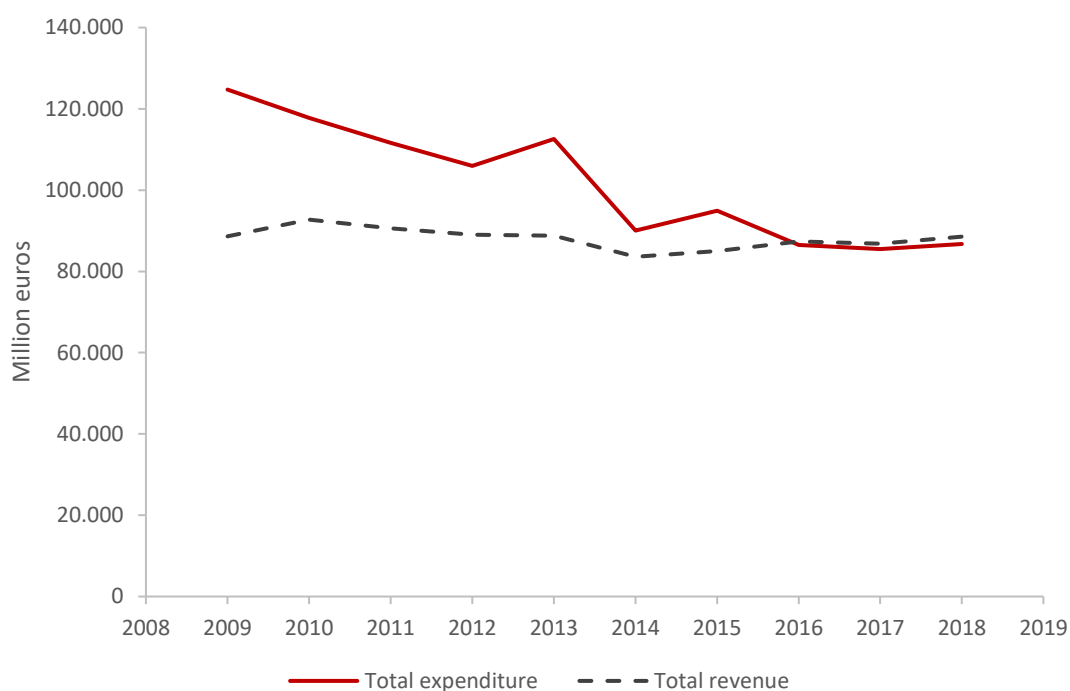
Source: NIESR

One of the explicit objectives of the adjustment programmes was to reduce the large current account deficit that was seen as a symptom of a society dubbed to be "living beyond their means". The very quick rebalancing of the current account from a deficit, -13 per cent of GDP in 2009, to balance in 2014 was achieved quasi-exclusively through a reduction in imports, not an increase in exports. Households' real personal disposable income dropped by 35 per cent over that period. Consumers tried to smooth their consumption and households' savings reached a record low of -15 per cent of real personal disposable income. This ratio was by far the lowest among all OECD countries (figure 11). In that sense, the objective of balancing the current account by increasing the size of the trading sector was not immediately successful (see also Gros et al., 2015).

Figure 10: Greece general government expenditure and revenues (percentage points of GDP change since 2009)
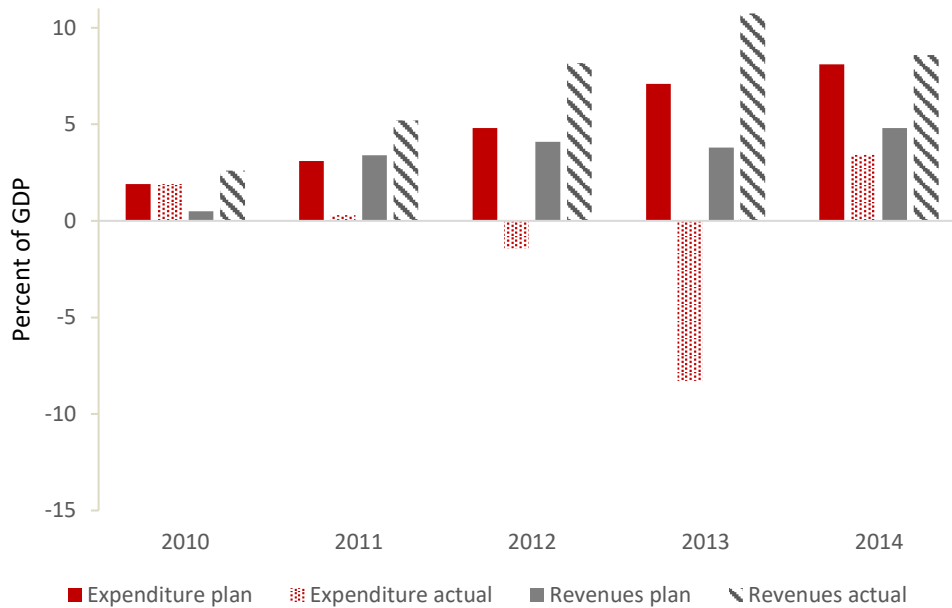
Note: Measures represent the effort planned in the first adjustment programme [1] and actual are the actual efforts. For the year 2014, the plan only includes a budget balance effort of 2% without distinguishing between expenditure and revenues, so we assume that the effort is equally split between 1 per cent for expenditure and 1 per cent for revenues.

Source: NIESR

It is possible to challenge the need to aim for a balanced current account position particularly since Greece did not go through a balance of payment crisis (often called 'sudden stop') like other countries requiring IMF funding outside the euro area. Indeed, being part of the euro as a currency area meant that Greece benefitted from the possibility for the Bank of Greece (as part of the Eurosystem) to provide/create hard currency-liquidity against even (very) low-quality domestic collateral. Consequently, the size of its current account deficit had at best a subordinate importance for the country's capacity to finance it. Klitgaard and Higgins (2014) and Cecchetti and Schoenholtz (2018) contain a description of the balance of payment crisis in the euro area periphery.

Figure 11: Greek households' savings ratio among OECD peers
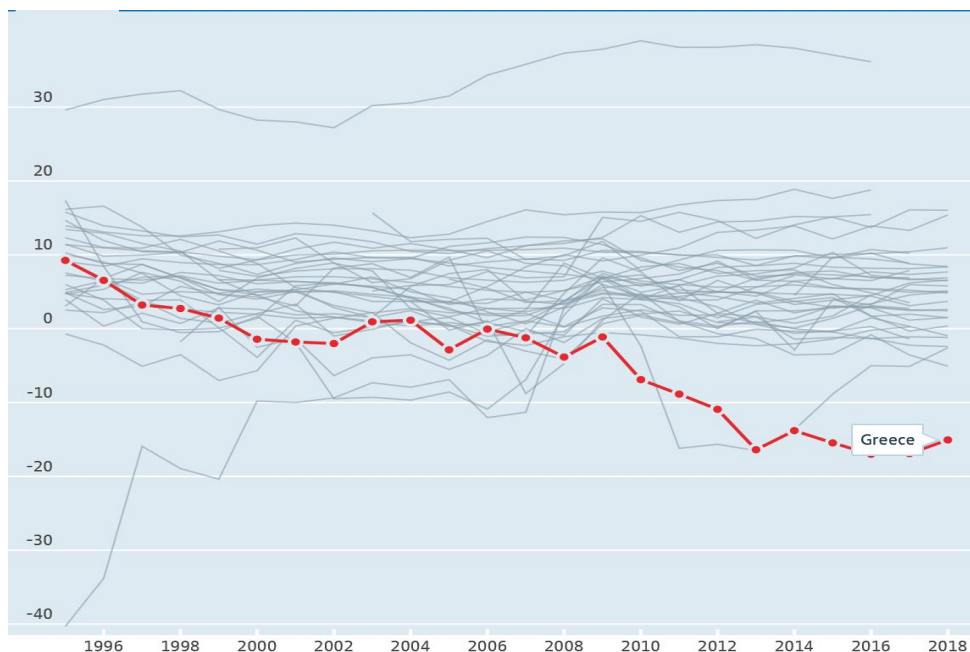
Source: OECD

4.1.1 Scenario 1: Protecting Greek public investment

The reduction in public investment turned out to be much larger and more persistent than planned. Public investment was reduced by about 2 per cent of GDP in 2010-2011 (figure 12). Such a difference is substantial if one thinks that the first and second adjustment programmes only called for a reduction of about 0.2 percentage points of public investment. The most likely explanation is that investment served as an adjustment variable to improve the budget balance faced with political pressure to keep the level of public consumption from decreasing unnecessarily. This was confirmed in our stakeholders' interviews which noted that the government found it easier to cut investment in roads or stadiums than to cut wages or pensions. The OECD (OECD, 2018) also criticized Greece for making drastic cuts in particular in its railway infrastructure. They noticed that the average infrastructure spending on railways declined by 71 per cent between 2000-08 and 2009-15 whereas the average spending on roads fell by less than 10 per cent.

The large reduction in public investment had large and persistent economic consequences in a country where public investment accounts for nearly a third of overall investment (compared to an average of 1 eighth in the OECD). The channels through which lower public investment impacts the economy are two-fold.

Figure 12: Ratio of public investment to GDP in Greece

Figure 13: Impact on GDP and potential GDP of a permanent reduction of government investment of 2% of GDP in Greece
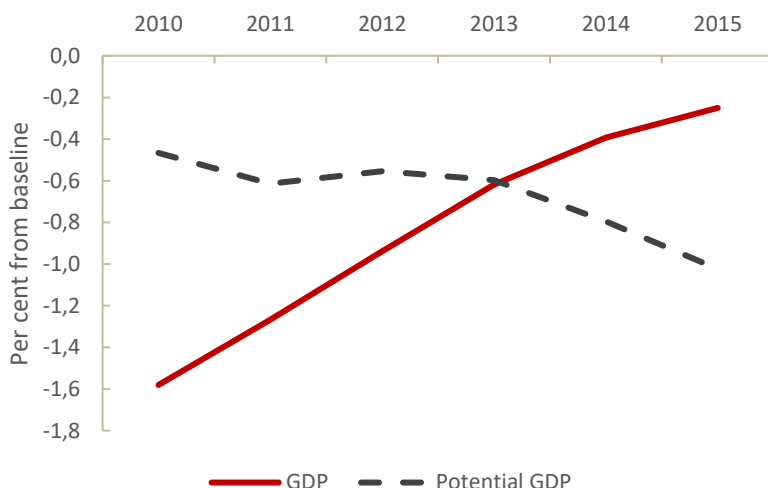
Note: The shock is a permanent reduction in government investment of 2% of GDP. Solvency rule is off so that there are no offsetting measures on taxes. NiGEM Simulations.

First, reducing public investment leads directly to a reduction in GDP through its effect on aggregate demand. Secondly, this affects also supply, through a reduction in the capital stock leading to a permanent reduction in potential output.

Figure 13 shows an illustrative simulation done in NiGEM of a permanent reduction in government investment by 2 per cent of GDP. The demand effect is larger in the first year, with GDP declining by 1½ per cent and potential GDP declining by only about half a per cent. The first year multiplier is therefore

about 0.8 and inflation declines by 0.1 percentage point in the first year and 0.3 percentage points in the second year. In the simulation, lower inflation increases real income for households and consumption progressively increases to offset some of the reduction in government investment. Starting from the second year, the demand effect of the reduction in government investment diminishes up to the point where it is outweighed by the supply effect in the fifth year (2014 in our simulation).

The large effect of public investment on the economy was also highlighted in the academic literature. Using data from 17 OECD countries between 1985 and 2015, Abiad et al (2016) found that increased public investment raised output, both in the short term and in the long term, crowded-in private investment, and reduced unemployment. They found that those effects depended on several factors including economic slack, public investment efficiency and how public investment was financed.

Because the multiplier for public investment tends to be larger than for other fiscal measures (see for example Abiad et al, 2016), it was economically not ideal to focus such a large part of the deficit reduction on public investment. One important consideration with regards to public investment in Greece is that a significant part of the projects is co-financed by the European Union. Between 2010 and 2017, public investment co-financed by the EU accounted for about 8 tenths of total public investment. Some of the EU-funded projects were not implemented because of a lack of funding from the Greek-side. In retrospect, the adjustment programmes should have included a measure on ring-fencing public investment that is essential to the long-term prosperity of the country. To illustrate this proposition, we present in the following section a simulation of an alternative adjustment programme that would have included less weight on public investment cuts.

In a first counterfactual scenario, we look at an alternative fiscal consolidation where government investment would have stayed at the same level as the pre-adjustment programme level, and the reduction in public consumption would have been made more severe to keep the deficit reduction target unchanged. We, therefore, assume that government investment would be higher by 2 percentage points of GDP than the baseline for 5 years and government consumption lower by the same amount for the same time. The main difference with the previous simulation is that the new shock is neutral on the side of the deficit.

Figure 14: Simulation of higher public investment and lower public consumption (2% of GDP each) for Greece
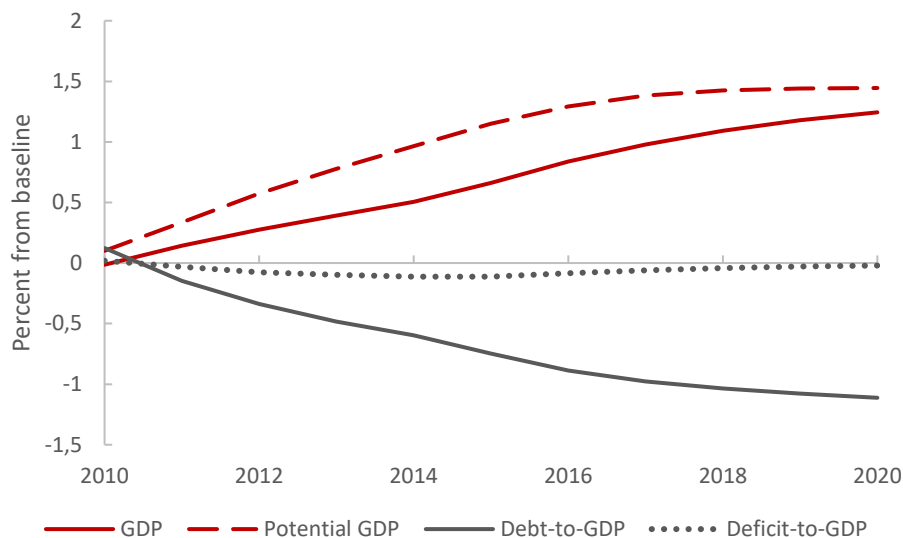
Note: Debt-to-GDP and Deficit-to-GDP are expressed in percentage points from baseline. The shocks are a 5-year increase in public investment by 2% of GDP and a similar size decrease in public consumption. Simulation is done in NiGEM.

Source: NIESR

Figure 14 shows the response of GDP, potential GDP, deficit and debt to this fiscally neutral shock. In the first year, the effects of higher public investment and lower public consumption fully offset each other and the net effect on GDP and the deficit is null. In the following years, the supply-side effects of investment that we had shown in the first simulation gradually phase-in and act as a boost to the economy. The increase in public investment is not only a demand shock but also a supply shock which increases the equilibrium level of capital to GDP by reducing the user cost of capital. Private investment also benefits from the lower user cost of capital (in a process called crowding in effect). Potential GDP increases by up to 1.5 per cent over 10 years compared to the baseline and GDP progressively catches-up to the higher potential of the economy. The opening of the output gap leads to lower consumer prices that benefit households by increasing their real personal disposable income.

Despite the shock being neutral on the deficit-side, debt decreases by 1 percentage points of GDP over the same period thanks to the increase in gross domestic product. While reducing the ratio of debt to GDP by 1 point would have been welcome, it is not much compared to the 50 basis points increase observed between 2009 and 2014 (see figure 3).

4.1.2 Scenario 2: An earlier and more decisive intervention to restore confidence

One of the limitations of the first programme is that it did not fully take into account the recessionary impact of the programme on GDP growth. It did indeed assume a contraction in GDP in the first two years, but it did not clarify if this contraction was a carry-over from the previous years, if it was related to an increase in risk premium related to a general loss of confidence, or if it was the endogenous response of the economy to the fiscal contraction.[5] This point is however crucial in understanding the limitations of the adjustment programmes. Assuming an alternative GDP growth profile would possibly help understand what it would have taken to make the programme more "sustainable", particularly if one takes into account the fact that fiscal multipliers were possibly larger.

Figure 15 shows that indeed the contractionary effect of the programme was importantly underestimated (including, partly, the size of the multiplier; Blanchard and Leigh, 2013a). Of course, one should keep in mind that external shocks like the euro area debt crisis may explain part of this deviation between GDP growth forecast and outturn.

Based on this analysis, another factor that was possibly economically misguided was the fact that an aggressive fiscal consolidation would not necessarily be associated with a reduction or at least stabilisation of the debt to GDP ratio. The reason for that is that the fiscal multiplier turned out to be larger than one, hence, GDP was expected to decline by more than the reduction in the budget deficit. In normal times, one would expect the multiplier to be less than one.

As the government stopped providing some services to households and increased taxes, then households would have been expected to reduce their savings to smooth their consumption to their lower real personal disposable income. However, in this case, the adjustment was so severe, that it contributed to a generalized loss of confidence by businesses and households. Figure 16 shows that it took about 10 years to restore the confidence lost by

---

[5] European Commission (2010a) includes the following statement: "The short-term real growth outlook is unfavourable. Real GDP growth is set to contract significantly in 2010-2011 and to recover only slowly thereafter. The economic programme assumes negative growth of 4 percent in 2010 and 2½ percent in 2011. High uncertainties, expensive external financing, tight credit conditions and fiscal consolidation will weigh on the private sector in 2010-11. A rebound will only be possible when market and private sector confidence returns and the effects of structural reforms start to materialize."

households and businesses in both the industrial production and services' sector.

Figure 15: Real GDP growth during the first adjustment programme

Real GDP growth
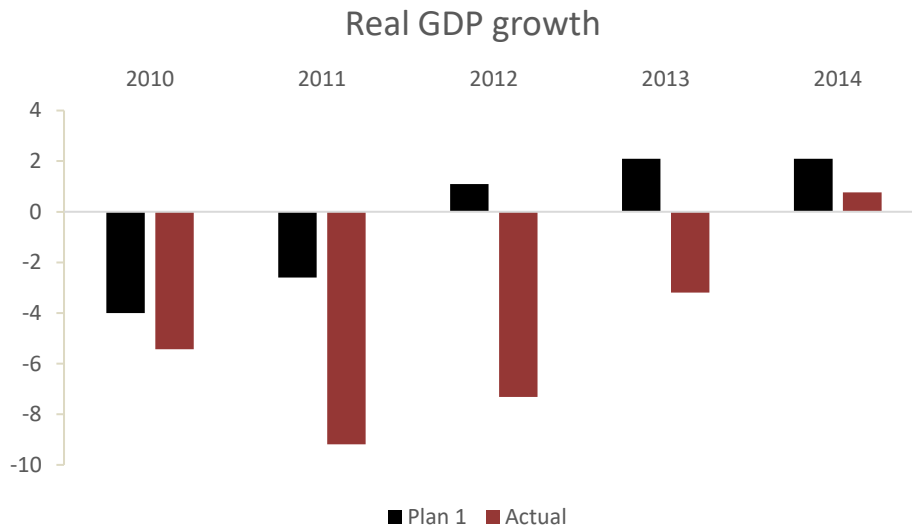
Source: NIESR

In our view, Greek and European authorities failed to pass the message essentially on three main points: (i) that the deficit would be brought under control, (ii) that the "costly but required" structural reforms would have helped the economic dynamism and (iii) that the euro area institutions would be supportive of this effort. Between January 2010 and February 2012, the Greek 10-year government bond yield increased from 6 to 36 per cent (figure 17). Such a punitive rate illustrated the fact that despite being for 2 years in an adjustment programme supported by the IMF, the European Commission and the European Central Bank, investors had lost confidence in the ability of the Greek government to service its debt.

Figure 16: The loss in consumer and business confidence
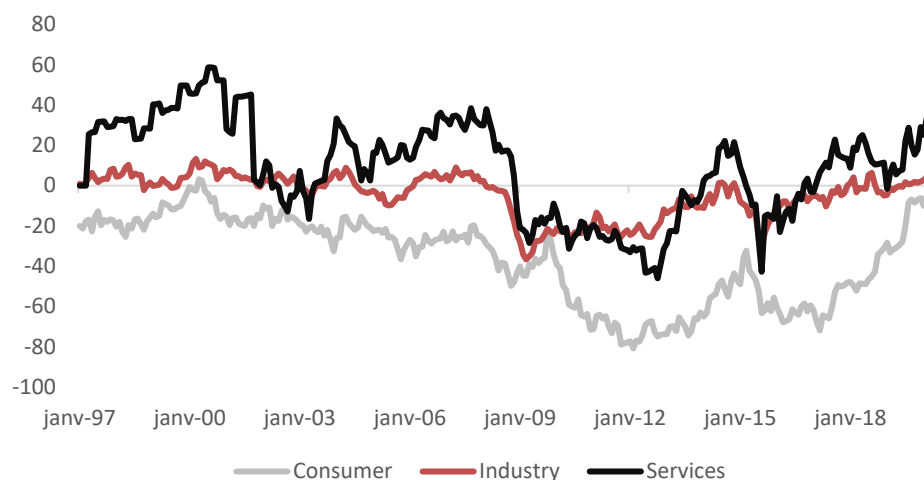
Source: European Commission

The Greek debt was subsequently restructured and a second adjustment programme was implemented. The problem was however not isolated to Greece, as the euro area debt crisis had spread to European countries. At about the same time, Portuguese 10-year yield spiked at 17 per cent in January 2012 and Irish 10-year yield spiked at 12 per cent earlier in June 2011 (Figure 17). Another spike in the Greek 10-year bond yield occurred in 2014-2015 when the Parliamentary elections led to the victory of the Syriza party led by Alexis Tsipras on a platform of anti-austerity measures turning its back on the IMF-ECB-EC-led adjustment programmes.

The link between risk premium and confidence has been established in the economic literature. An increase in confidence is generally expected to lead to a decrease of risk premium. For example, Bansal and Shaliastovich (2009) show using a general equilibrium model that asset price cycles that do not match real business cycles can be explained by changes in investors' confidence that directly impact the risk premium. Chowdhury (2011) establishes empirically the link between equity risk premium and consumer confidence. The author finds that during the Great Recession, the increase in equity risk premium can be explained by a collapse in consumer confidence.

Alesina, Prati and Tabellini (1989) explain that a run on government debt can be a self-fulfilling event where investors lose confidence in the ability of the government to roll over debt, leading to an increase in risk premium and in bond yield, which makes the burden of debt higher for the government and increases again the risk of default and the risk premium paid by investors. Alcidi and Gros (2019) call this phenomenon a 'dangerous doom loop'.

In this second counterfactual scenario, we assume that Greek risk premium starting from 2010 did not shoot up as much as it did but instead matched the lower risk premium of Portugal. The restoration of confidence associated with this lower risk premium could have come from more decisive and coordinated actions by the main stakeholders in the adjustment programme: the Greek government and parliament committing to adhere strictly to the adjustment programmes and the ECB and other European institutions committing earlier to back Greece and exclude the risk of a 'Grexit' scenario.

Figure 17: 10-year government bond yield for Greece, Portugal, Ireland and Spain
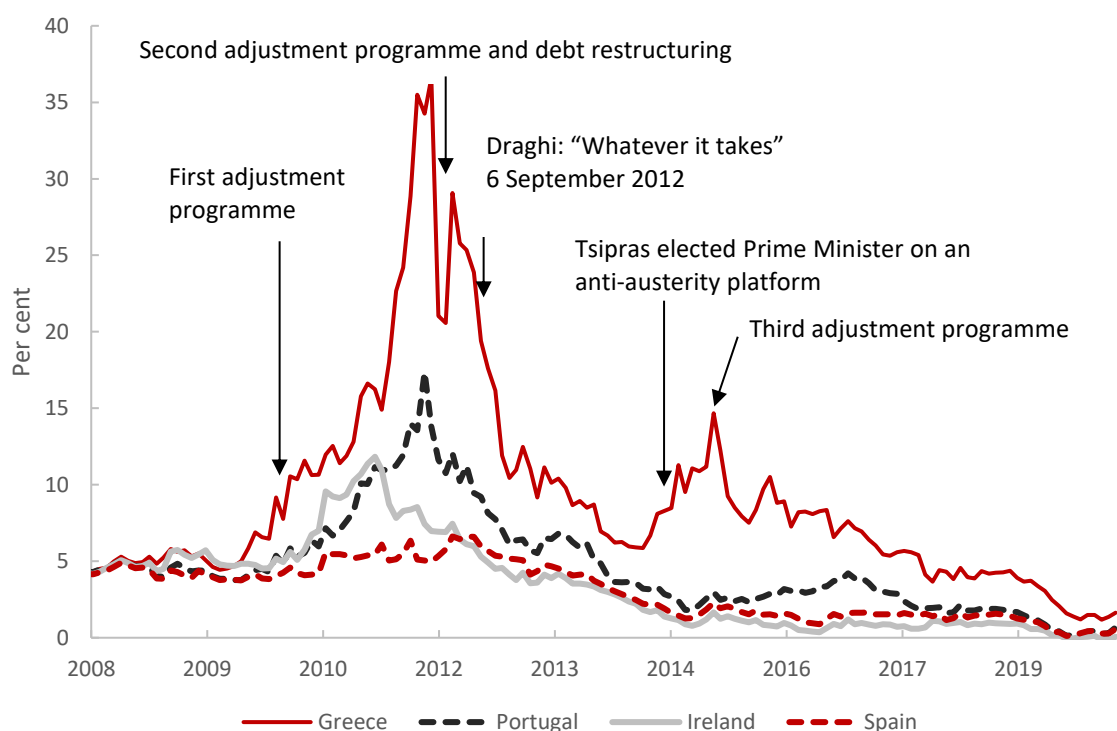
Source: NIESR

We model the risk premium shock by a reduction in the term premium. The term premium is the amount by which the yield on a long-term bond is greater than the yield on shorter-term bonds. This premium reflects the amount investors expect to be compensated for lending for longer periods.

Figure 18 shows the result of the simulation on GDP and the ratios of debt and deficit to GDP under the assumption of less stringent market speculation. With a lower risk premium, GDP would have been up to 7 per cent higher and the ratio of debt-to-GDP would have been lower by up to 23 percentage points. The biggest impacts would have been in 2012 for GDP and 2013 for debt to GDP. A lower risk premium would have decreased the user cost of capital and

moderated the dramatic fall in investment that occurred in Greece (private sector investment dropped from EUR 35 billion in 2009 to EUR 14 billion in 2015, equivalent to a fall of 60 per cent). The increased investment would have led to an increase in capacity and a subsequent reduction in consumer prices. Similarly to our first scenario, albeit with a larger effect, the reduction in consumer prices would have lifted household real personal disposable income and led to higher domestic consumption.

Figure 18: Simulation of a reduction in risk premium in Greece equivalent to the risk premium of Portugal
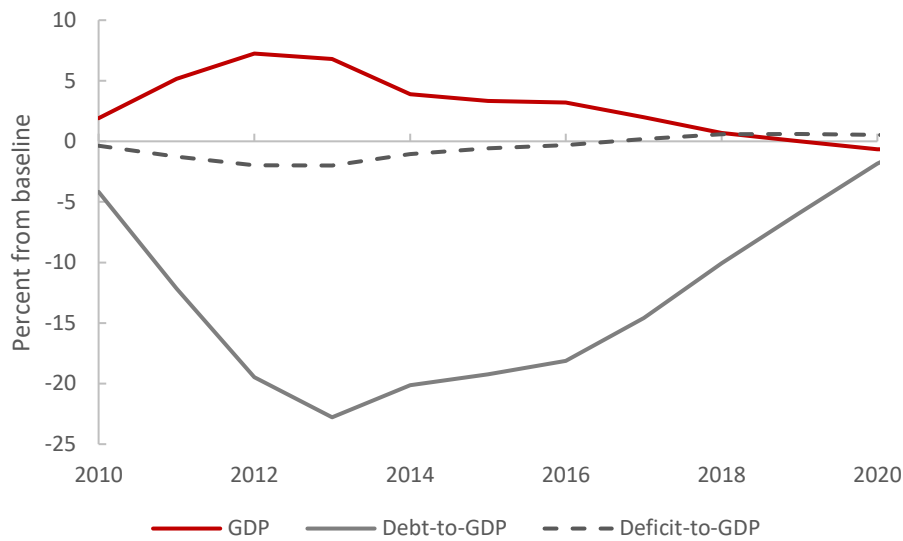
Note: Debt-to-GDP and Deficit-to-GDP are expressed in percentage points from baseline. The shock is a decrease in term premium with two troughs, one reaching -14 percentage points in 2012 and the other one reaching -9 percentage points in 2015. Simulation is done through NiGEM.

Source: NIESR

As a robustness check, we change the assumption of setting the risk-premium to mirror that of Portugal to instead mirror the average risk-premium of other programme countries (Ireland, Portugal plus Spain). Doing so did not change the simulation very much; it would make the gain in GDP slightly bigger and the reduction in debt-to-GDP larger.

The latter simulation reinforces the message that a key failure of the adjustment in Greece was to fail to control the spike in risk premium that reflected a loss of confidence from financial markets. Had the European and Greek institutions intervened earlier and more decisively, we speculate policy uncertainty would have been reduced, risk premium would have likely decreased, and the adjustment programme would have likely been much less

painful for the Greek economy than it was. Several measures could have shaped expectations towards a more favourable equilibrium such as an (i) earlier debt restructuring, (ii) an earlier intervention by the European Central Banks to "do whatever it takes", (iii) a swifter debt sustainability plan among international and Greek authorities.

4.1.3 Scenario 3: A slower adjustment path

Many economists have argued that the adjustment in Greece was too severe. For example, our stakeholder survey shows that 7 out of 10 respondents disagreed with the statement that the time horizon for the Greek adjustment programmes was appropriate. With a more gradual adjustment spread over a longer period, would Greece have avoided the downward spiral of lower growth and more fiscal consolidation? In economic terms, the debate boils down to whether the fiscal multiplier is higher in the initial part of the adjustment or the later part. If the fiscal multiplier is higher at the beginning of the adjustment period, then the path of GDP is higher when the adjustment is spread out over a longer period. This process is described by Blanchard and Leigh (2013b) with the catchy phrase "less pain now, less pain later".

As explained in the literature review, several factors can contribute to changes in fiscal multipliers. Economic research suggests that the fiscal multiplier is higher than normal when: (a) there is a large proportion of liquidity-constrained consumers, which means that that they would consume more if they were able to borrow more, (b) the economy is less open, (c) the monetary policy interest rate is at the zero lower bound (ZLB), which means that the central bank sets its short-term interest rate at or near to 0% or (d) the economy is in a recession.[6]

Let us look at the factors one by one to see how they applied to Greece during its adjustment programmes. Factors (a) and (b) relate to structural features of the economy. While one of the objectives of the adjustment programmes was to implement structural reforms, those reforms take time and it is, therefore, difficult to find evidence that the proportion of liquidity-constrained consumers or the degree of openness of the economy would have changed sufficiently

---

[6] Concerning the "zero lower bound", the latter might not necessarily impede monetary policy from being effective, as Altavilla et al. (2019) remark. The authors in particular show that a negative interest rate policy (NIRP) is able to provide stimulus to the economy through firms' asset rebalancing.

during the adjustment programmes to modify the fiscal multiplier in a meaningful way.

Factors (c) and (d) are more temporary factors that relate to the state of the economy in a business cycle. In the first 4 years of the adjustment programmes from 2010 to 2014, the ECB interest rates were not at the ZLB. It is only on 10 September 2014 that the main refinancing operations interest rate reached 0.05%, which can be considered as the ZLB, and it has stayed close to 0 until the present time. According to the argument that the fiscal multiplier is higher at the ZLB, it was ex-post preferable to front-load the adjustment before the interest rate reached the ZLB.

The recessionary period from 2010 to roughly 2013 was followed by 3-years of economic stagnation, and it is only in late 2016 that the recovery was firmly underway. Extending the adjustment period beyond the recessionary period would potentially have allowed benefiting from a lower multiplier after 2013, but the argument is weakened by the fact that it is only after 2016 that the recovery was evident.

Taking into account all the factors listed above that may impact the fiscal multiplier, there is no clear-cut empirical evidence that spreading the adjustment over a longer period would have made the adjustment less painful. The forecasts of interest rate normalization and a quick return to growth never materialized. On the contrary, if the Greek government had announced plans to balance the budget in a more distant future – for example beyond the tenure of a parliament -, then it could have made the commitment of fiscal consolidation less credible to investors.

In the following, we study another argument in favour of backloading the adjustment: hysteresis. Hysteresis is generally observed in the labour market: people who stay unemployed for several years often find it very difficult to be recruited because they are rightly or wrongly perceived to have lost skills and they are less attractive to potential employers. But does hysteresis also apply to public finances?

To answer that question in the context of the Greek adjustment programmes, we run a stylized simulation where the length of the adjustment programmes is extended from 7 to 10 years. The benchmark 7-year period corresponds to the period that it took for the Greek government to return to a positive fiscal balance. After 2016, the fiscal consolidation effort was minimal. Figure 19 shows the fiscal effort expressed as budget balance improvement since the

beginning of the Greek adjustment programme. The full black line corresponds to a smoothed adjustment that we will use as a benchmark for the simulation.

Figure 19: Fiscal effort expressed as budget balance improvement compared to 2009Q4
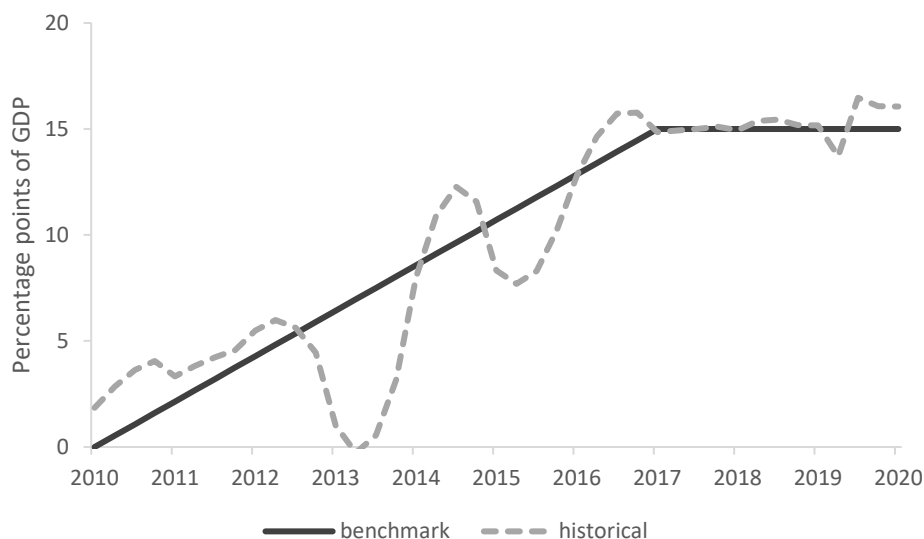
Source: NIESR

Our study period from 2010 to the end of 2016 encompasses the consolidations from the three consecutive adjustment programmes. We calibrate the 3-year extension so that the total cumulative consolidation as a percentage of GDP is equal to the benchmark case. In the counterfactual of slower adjustment, the yearly consolidation effort is less in the first seven years, but more in the following three years.

Error! Not a valid bookmark self-reference. shows a stylized version of the effort in the two cases. The areas below the full line and below the dashed line are equal by construction, which represents the fact that we keep the envelope of fiscal consolidation equal between the 2 scenarios. Only the distribution of effort across time is altered.

Figure 20: Stylized fiscal effort
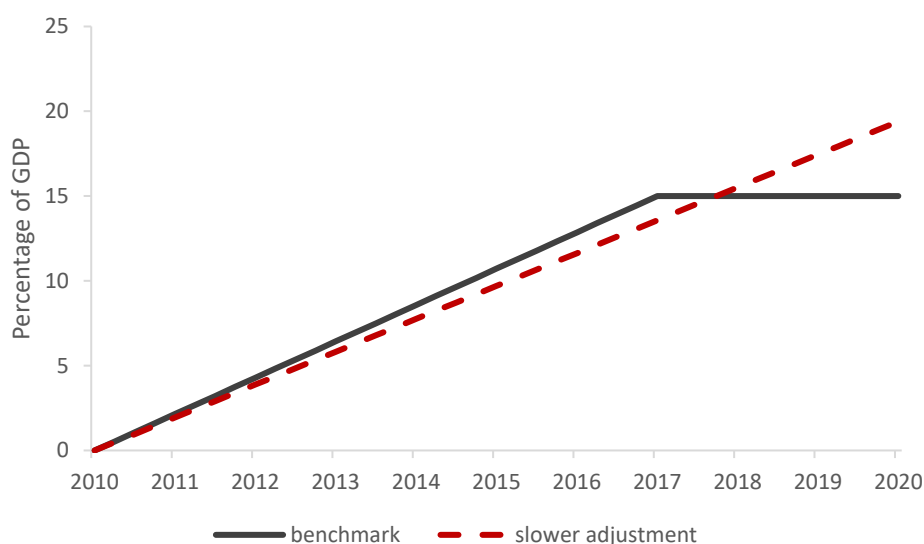
Source: NIESR

We split the fiscal consolidation effort into direct and indirect tax increases, and cuts in public consumption and investment. Each fiscal shock is defined using the methodology described above as the difference between the dashed line and the full line. The table below shows the extent of consolidation in each fiscal category.

Table 2: Fiscal consolidation by category between 2009 and 2016

Category	Effort from 2009 to 2016 in percentage points of GDP
Corporate tax	0.4
Household tax	3.1
Indirect tax	7.1
Consumption	3.3
Investment	2.3
Transfers	-2.4
Balance	15.6

Note: a positive (resp. negative) number represents a consolidation (resp. loosening)

Source: NIESR

We use the same macroeconomic model NiGEM to run this counterfactual as we did for the previous two counterfactuals. The Greek model in NiGEM is estimated so that the multipliers correspond to normal times, rather than distressed times. Additionally, the agents are forward-looking and anticipate the future stance of fiscal policy. In our simulation, households know that even though the fiscal stance is accommodative in the first period, it will become contractionary in the second period. As a result, they consume less than if there was no contractionary period to follow and the fiscal multiplier is lower in the first period. Figure 21 shows the juxtaposition of the simulation result of a

slower adjustment to the actual path of GDP from 2010 to 2019. One can see that hardly any of the dramatic loss of GDP from 2010 to 2013 is regained. It is not surprising because Error! **Not a valid bookmark self-reference.** shows a stylized version of the effort in the two cases. The areas below the full line and below the dashed line are equal by construction, which represents the fact that we keep the envelope of fiscal consolidation equal between the 2 scenarios. Only the distribution of effort across time is altered.

Figure 20 makes clear that the fiscal stance between the historical data and the counterfactual are very similar in that period. In addition, the fact that the multiplier is lower because of the anticipation effect also dampens the stimulative effect of backloading the fiscal adjustment. In the later period from 2017 to 2019, the fiscal stance becomes much more contractionary in the slower adjustment scenario and the recovery in GDP growth becomes much more muted.

Figure 21: Greek GDP with counterfactual of slower adjustment
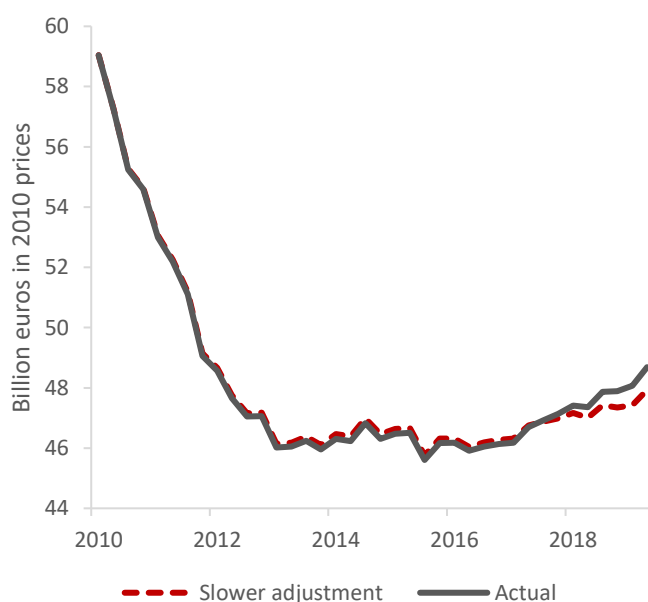
This simulation shows that imposing a slower adjustment path would probably not have improved the trade-off between fiscal consolidation and GDP growth. It would also not have led to a reduction in the ratio of debt to GDP. The concern about hysteresis, therefore, does not appear to justify by itself postponing the

necessary fiscal adjustment. Changing the length of the time extension does not qualitatively modify the results.

One limitation of the counterfactual exercise of changing the speed of the adjustment is that in practice, the speed of the adjustment is to some extent endogenous to the adjustment itself. A successful adjustment may take less time than planned and - in the case of Greece - a difficult adjustment takes longer than planned. As a result, a counterfactual "stick-to-the-plan" of a faster or slower adjustment will tend to ignore.

4.2   LABOUR MARKET AND WAGE POLICIES

In this section, we depart from the model simulation and use standard empirical analyses to observe how labour markets and wages reacted to those years of macroeconomic and fiscal adjustment. One important take-away is that wages were reduced. But did this did not help the adjustment of the external sector much. As explained in Box 4, the internal devaluation was not particularly effective in generating extra exports and jobs. In particular, the fact that the export sector was small suggests that it was questionable whether any adjustment in the external accounts was needed. Wage adjustments had the indirect effect of reducing Greek consumption of goods and services produced outside of Greece.

Against the background of tightening labour markets – particularly, during the early stages of the first programme since 2010 – the trajectory of nominal wage growth has been very muted in programme countries other than Greece (see figure 22). The behaviour of nominal wages in the average programme countries appears less puzzling in the light of the feeble productivity dynamics observed over the past ten years. One additional explanation regarding wages' behaviour relies on downward nominal wage rigidities. During the recession, many firms might have faced limits on cutting wages nominally. As a result, the labour market has in many cases adjusted through the extensive margin (hours worked), rather than through the intensive margin (wages). Greece stands out as a special case (see also Belke and Gros, 2017).[7]

In Greece, nominal wage growth seemed to have consistently adjusted to the economic performance particularly since 2010, possibly as the results of the Programme negotiations. A close inspection of the data in figure 22 shows that wages started to fall by almost 3% annually in 2010.

Three major waves of public wage reform were introduced by the Greek government (Christopoulou and Monastiriotis, 2014) since the start of the first programme. In 2010, all wages were reduced horizontally (by about 10 per cent). In 2011, pay-scales for the so-called "narrow" public sector were unified and extended (*ibid.*). Labour reforms came later in the private sector, after 2011, as the government set targets for reducing its current account deficit and increasing wage competitiveness. Finally, in 2012 Greek ministers agreed to

---

[7] Belke and Gros (2017) also show that a negative relationship between unemployment and inflation started for Greece only with the programme years. This is yet again an indication that the labour market operated differently within the programme.

deep-cut the minimum wage by 22% in return for the second rescue package, imposing nominal reductions on the standard minimum monthly wages and public-sector wage freezes conditional on unemployment falling by more than half (from 25 per cent to 10). The government also downgraded collective bargaining agreements and started selective deregulation of occupational licensing. The adjustment on wages hit the already besieged supply of labour after several years of recession. As a result, wages have struggled to gain momentum during the subsequent recovery. According to Christopoulou and Monastiriotis (2014), such a strong downward adjustment of wages was mainly driven by the developments in the private sector, under the pressure of an overall fall in domestic demand. This was less the case for wages in the public sector where cuts were largely horizontal.

Another factor which makes Greece stand out from other programme countries is the absence of a clear relationship between measures of labour market slack, as measured by unemployment, and wage growth (the so-called Phillips curve; see Belke and Gros, 2017). The observed drop in wages *per sé* did not seem to bring about an increase in regional unemployment over the crisis years as well. Daouli et al. (2017) for instance, find a negative relationship between wages and regional unemployment to be relatively "short-lived" and over the period 2010Q2–2011Q4 only. Such a relationship appeared to be mainly explained by the restructuring of the collective bargaining arrangement and the reduction of national minimum wages in the private sector (*ibid.*).

To capture the differences in the labour market adjustment process among the 'programme' countries, and thus their macroeconomic adjustment costs and effects, we compute some very simple impulse response functions (see also Alcidi et al, 2014 for a discussion) asking whether structural and labour market reforms affected wages, employment, productivity and output over the period 2010-2018. In particular, we focus on episodes of structural and labour market reforms implemented in a number of countries such as Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom; with Greece, Portugal and Ireland being classified as 'programme'. Based on these, we then evaluated what effect structural reforms had on programme countries, as opposed to other non-programme countries. We use this exercise to embed the reforms undertaken within the Greek adjustment programme in a broader framework before we investigate the wage adjustment more closely in Section 4.2.1.

Figure 22: Through to peak adjustment of wages in Greece compared to Programme countries

Wages in Programme Countries (excluding Greece) vs Greece
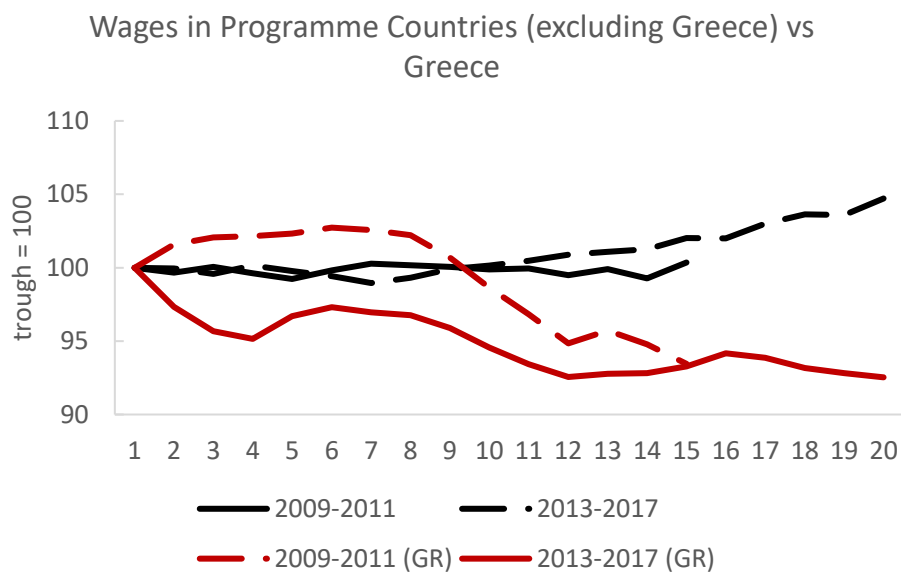
Source: NIESR

To look formally at how output, employment, labour productivity and wages have evolved in the periods preceding and following the reforms, we focus on the episodes around which policy has changed (i.e. the time when a given structural reform - such as minimum wage reduction - has taken place) using local projection impulse response functions (see Jordà, 2005). Similar approaches have been used recently to study the dynamic impact of both macroeconomic fiscal shocks (Jordà and Taylor, 2013; Auerbach and Gorodnichenko, 2012) as well as the response of the macroeconomy to reform shocks, see, e.g. Duval and Furceri (2018).

The identification of the effects of policy shocks, such as labour market or fiscal consolidation in empirical studies has broadly taken one of two forms. The first one is in the context of a vector autoregression, e.g., Alesina and Perotti (1995), Mountford and Uhlig (2009); the second one is through instrumental variables. Examples of this approach include Auerbach and Gorodnichenko (2012, 2013), Mertens and Ravn (2013, 2014).

The suitability of using a local projection approach is that it allows to still study the macroeconomic reactions to structural reform shocks. Differently from previous approaches, however, this method allows generating a set of stylized facts, by making no assumptions on the pattern of the response functions, the underlying data generating process, as well as the nature of the shocks. In other words, local projections are typically considered a more flexible

alternative compared to others methods (see also Stock and Watson, 2007; Auerbach and Gorodnichencko, 2012), being at the same time suitable for estimating nonlinearities – such as, in our context, the interactions between reform shocks and the macroeconomy – or in the presence of small samples (Brugnolini, 2018).

In our case, the challenge thus remains the shocks' identification.

Major reforms of product market regulation, employment protection legislation and unemployment benefit systems have been conveniently identified by Duval et al. (2016; 2018), who have recorded legislative and regulatory acts for 26 individual advanced economies since 1970, based on OECD Economic Surveys, as well as additional country-specific sources. In this respect, their methodology is similar to the "narrative approach" used by Romer and Romer (1989; 2004); Devries et al. (2011).

Duval et al. (2016; 2018) dataset end in 2014, however, covering two of the three MoU in Greece, as well as the first programs in Portugal and Ireland. Using the qualitative information contained in a "narrative approach" allowed us to estimate the dynamic response to policy shocks in a panel framework using the structural labour market dummies available and estimate impulse-response functions of a series of macroeconomic indicators (namely output, employment, wages and productivity) among programme and non-programme countries. We complement this information with additional data, such as the OECD's measures of product market regulation (available until 2018) and some of the indicators in Campos et al. (2018).

Once reform shocks have been identified, a two-step procedure is employed consisting of, first estimating a panel vector autoregression model, and then finding the impulse response functions implied by the data (see Box 3). To estimate the dynamic response of output, employment, wage and labour productivity to reform shocks, we relied on the following baseline specification

$$y_{t+s,i} - y_{t-,i} = \alpha_i + \gamma_t + \beta_{1s} R_{i,t} + \theta X_{i,t} + e_{i,t} \tag{1}$$

in which y is, at each time, the variable of interest, namely the log of GDP, employment, the log of wage or the log of labour productivity (all coming from the National Institute General Econometric Model Dataset); β_{1s} denotes the (cumulative) response of the variable of interest in each s year after the reform; a_i are country fixed effects, c_t are time fixed effects, $R_{i,t}$ denotes the reform shock in the country considered; and $X_{i,t}$ is a set of control variables including two lags of the reform shocks, as well as lags of GDP growth and recession

dummies to control "crisis-induced reforms"; see Duval et al (2018). Equation (1) is estimated using ordinary least square.

The overall dataset covers the period 1970 – 2014, which allows us to draw stylized facts. To pin down the effect structural reforms had on 'programme countries', the baseline specification in eq. (1) is furher modified as[8]

$$y_{t+s,i} - y_{t-,i} = \alpha_i + \gamma_t + \beta_{1s} R_{i,t} + \beta_{2s} PROGRAMME_{i,t} \times R_{i,t} + \theta X_{i,t} + e_{i,t} \qquad (1')$$

where $PROGRAMME_{i,t}$ is a dummy capturing the reform years in Greece, Portugal and Ireland (Italy and Spain are not included as they did not formally enter an adjustment programme, albeit, in the case of Spain, an MoU was signed). Everything else being equal, β_{1s} still denotes the (cumulative) response of the variable of interest in each s year after the reform – as obtained from eq. (1). The coefficient β_{2s} captures the *marginal effect* for programme countries of the cumulative response of the variable of interest in each s year after the reform – as estimated in equation (1').

BOX 3 – LOCAL PROJECTIONS

Once reform shocks have been identified, a two-step procedure is employed consisting of, first estimating the model, and then inverting it to find the impulse response functions implied by the model's data generating process. Specifically, an impulse response function can be described as the difference between two forecasts:

$$IRF(t, s, \boldsymbol{d}) = E(\boldsymbol{y}_{t+s} | \boldsymbol{v}_t = \boldsymbol{d}_i; \boldsymbol{X}_t) - E(\boldsymbol{y}_{t+s} | \boldsymbol{v}_t = \boldsymbol{\vartheta}; \boldsymbol{X}_t) \qquad s = 0,1,2, \dots h \quad (1A)$$

where $E(.|.)$ denotes the mean squared error predictor; y_t is $n \times 1$ random vector; $\boldsymbol{X}_t$ $(\boldsymbol{y}_{t-1}, \boldsymbol{y}_{t-2}, \dots)'$; $\boldsymbol{\vartheta}$ is of dimension $n \times 1$; $\boldsymbol{v}_t$ is the $n \times 1$ vector of reduced-form disturbances; and $\boldsymbol{D}$ is an $n \times n$ matrix, whose columns $\boldsymbol{d}_i$ contain the relevant experimental shocks. The expression above shows that the statistical objective in calculating impulse responses is to obtain the best, mean-squared, multi-step predictions. These can be calculated by recursively iterating on an estimated model optimized to characterize the dependence structure of successive observations, of which a VAR is an example. While this

---

[8] The specification above could be augmented using a smooth transition function used by Auerbach and Gorodnichenko (2012) to estimate the macroeconomic impact of fiscal policy shocks in expansions versus recessions. The latter will mainly allow to escape the concern that some of those "shocks" may be endogenously determined by the state of the economy.

approach is optimal if indeed the postulated model correctly represents the DGP, better multi-step predictions can often be found with direct forecasting models that are reestimated for each forecast horizon. Therefore, consider projecting y_{t+s} onto the linear space generated by $(y_{t-1}, y_{t-2}, \ldots, y_{t-p})'$, specifically

$$y_{t+s} = \alpha^s + B_1^{s+1} y_{t-1} + B_2^{s+1} y_{t-2} + \ldots + B_p^{s+1} y_{t-p} + u_{t+s}^s \quad s = 0, 1, 2, \ldots, h \qquad (2A)$$

where α_s is an $n \, x \, 1$ vector of constants, and the B_i^{s+1} are matrices of coefficients for each lag i and horizon $s + 1$. Following Jorda (2005), we denote the collection of h regressions in (2) as *local projections*. According to definition (1), the impulse responses from the local-linear projections in (2) are

$$\widehat{IRF}(t, s, d_i) = \widehat{B}_1^s \, d_i \qquad\qquad s = 0, 1, 2, \ldots, h \qquad\qquad (3A)$$

with the obvious normalization $B_1^0 = I$. As explained by Jorda (2005), as we are interested in establishing the distributional properties of the estimates $\widehat{B}_1^s$, this is a rather straightforward exercise as the residuals u_{t+s}^s in (2) are a moving average of the forecast errors from time t to $t + s$ and therefore uncorrelated with the regressors, which are dated $t - 1$ to $t - p$.

Impulse response functions are then obtained by plotting the estimated β_s for $s = 0, 1, \ldots, 5$, with 90 per cent confidence bands computed using the standard deviations associated with the estimated coefficients β_{1s} and β_{2s} —based on clustered robust standard errors as follows: *Control* countries (Czech Republic, Denmark, Norway, Sweden, Switzerland, UK, Slovakia) *"Core"* (Austria, Belgium, Finland, France, Germany, the Netherlands); *"Periphery"* (Greece, Ireland, Italy, Portugal and Spain); see also Campos and Macchiarelli (2018),

Figures 23 to 27 report the results from the local projections capturing the response of employment (e), productivity (log, $lprodh$), wages (log, lw), output (log, ly) to:

- Product Market Regulation, PMR, shocks (including reforms in the sectors of Electricity, Gas, Telecommunications, Postal Services, Rail Transport, Air Transport, Road Transport);

- Employment Protection Legislation, EPL, shocks (EPL on temporary plus permanent contracts); and

- Overall unemployment benefits shock (including unemployment benefits based on replacement rates and duration).

Figure 23 shows the estimated dynamic response of GDP, wage, employment and productivity to product-market reform shocks over the five years following

a given reform implementation, together with the 90 per cent confidence interval around the point estimate. Confirming previous findings in Duval and Furceri (2018), major deregulation episodes have a positive and statistically significant output effect over the medium term, of about 1.5 per cent 4 years after the reform. This effect is unmuted for the first year in both the overall sample and for programme countries. For the 'programme' countries, the effect seemed to have been higher, i.e. as much as 3.8 per cent. While the point estimates suggest that both employment and labour productivity increased after PMR reforms, the latter is not individually statistically significant on the overall sample. In addition, the marginal effect on employment is individually not significant for programme countries. It should be also kept in mind that, in the case of Greece, much of the "structural reform shocks" that occurred after the first Programme were essentially relaxing labour legislation, as all PMR reform changes occurred in Greece up until 2008, according to Duval and Furceri. The marginal effect of productivity per hour on programme countries of deregulation seems to be initially positive before levelling off relatively quickly after 3 years.

As a robustness check on the effect of deregulation, and – in particular – taking into account the role of PMR shocks on the second part of the sample, up until 2018, including on programme countries, we also construct a reform shock based on the OECD indicator for the overall economy. The PMR indicator measures the regulatory barriers to firm entry and competition in a broad range of key policy areas, ranging from licensing and public procurement to the governance of SOEs, price controls, analysis of new and existing regulations, and foreign trade (Table 3). Such an economy-wide indices are reported every five years since 1998, hence they are available for the years 1998, 2003, 2008, and 2013 and 2018 (although the latter vintage is not directly comparable to the previous ones owing to a change in methodology, see OECD). By construction, the extent to which discrete changes in the PMR indicator represent actual reform shocks is hard to assess. In fact, there might be a natural time lag between the reform implementation and its reporting across the five-year window. Secondly, changes of the OCED PMR indicator over time may be the reflection of more than one reforms across more than one sectors so that the reported OECD indicator would essentially average out more than one reform episodes.

In Figure 24, we obtain quantitatively similar results for the overall sample except for wage and productivity during the programme years. Using discrete changes in PMR, as recorded by the OECD, does suggest indeed that

deregulation efforts have been successful in prompting wages (downwards-) and employment (upwards-) adjustments – albeit these results should overall be taken with care as there is no clear-cut evidence on their statistical significance across the different indicators in Figure 23 and 24.

Table 3: Economy-wide PMR Indicators according to the OECD

	Product market regulation				
	1998	2003	2008	2013	2018
Austria	2.12	1.61	1.37	1.19	1.44
Belgium	2.30	1.64	1.52	1.39	1.69
Czech Republic	2.65	1.89	1.51	1.41	1.30
Denmark	1.66	1.48	1.34	1.21	1.02
Estonia	.	.	1.37	1.29	1.29
Finland	1.94	1.49	1.34	1.29	1.37
France	2.38	1.77	1.52	1.47	1.57
Germany	2.23	1.80	1.40	1.28	1.08
Greece	2.75	2.51	2.21	1.74	1.56
Ireland	1.86	1.58	1.35	1.45	1.38
Italy	2.36	1.80	1.51	1.29	1.32
Netherlands	1.82	1.49	0.96	0.92	1.10
Norway	1.87	1.56	1.54	1.46	1.15
Portugal	2.59	2.12	1.69	1.29	1.34
Slovak Republic	.	2.18	1.62	1.29	1.52
Spain	2.39	1.79	1.59	1.44	1.03
Sweden	1.89	1.50	1.61	1.52	1.11
Switzerland	2.49	1.99	1.55	1.50	1.53
United Kingdom	1.32	1.10	1.21	1.08	0.78

Source: OECD

Figure 23: Local projection response of output, employment, productivity and wages to a deregulation shock (PMR)

Figure 24: Local projection response of output, employment, productivity and wages to a deregulation shock (OECD PMR)

Response overall sample 1998 – 2018	Marginal response for Programme Countries (-2018)

Local Projection Responses of ly to PMR_OECD_i Shock

Local Projection Responses of ly to PMR_OECD_i_PROG Shock

Local Projection Responses of e to PMR_OECD_i Shock

Local Projection Responses of e to PMR_OECD_i_PROG Shock

Local Projection Responses of lprodh to PMR_OECD_i Shock

Local Projection Responses of lprodh to PMR_OECD_i_PROG Shock

Local Projection Responses of lwage to PMR_OECD_i Shock

Local Projection Responses of lwage to PMR_OECD_i_PROG Shock

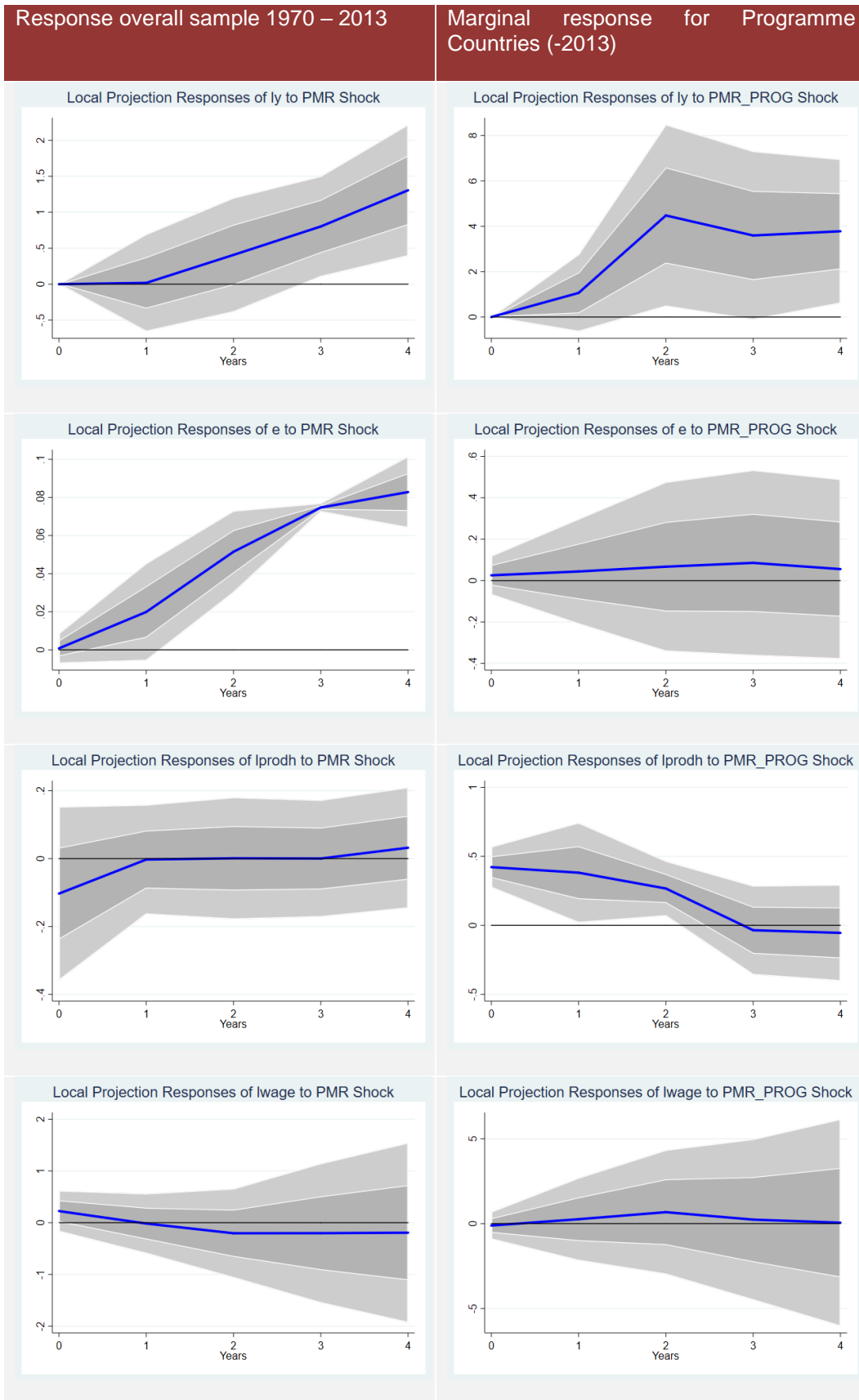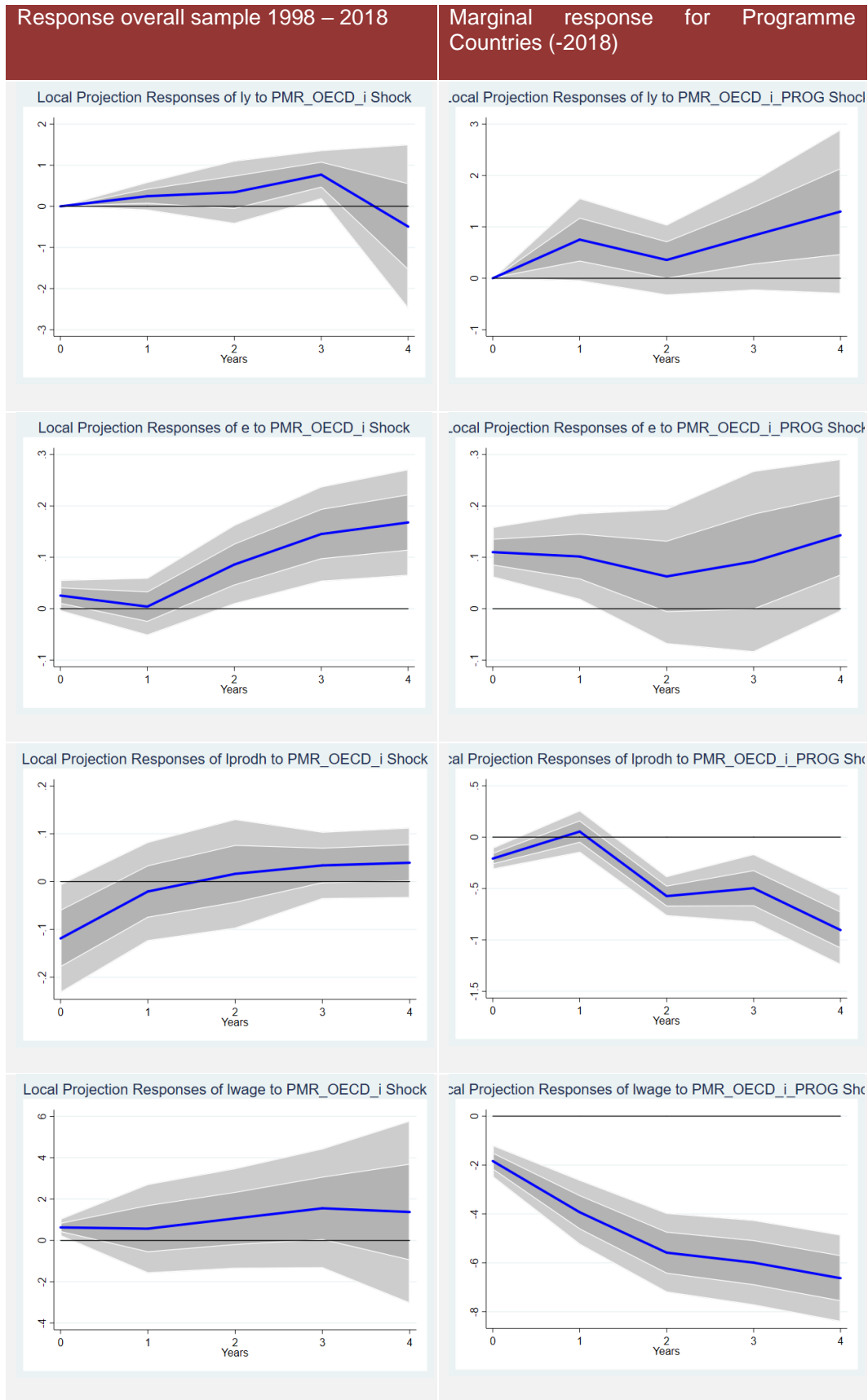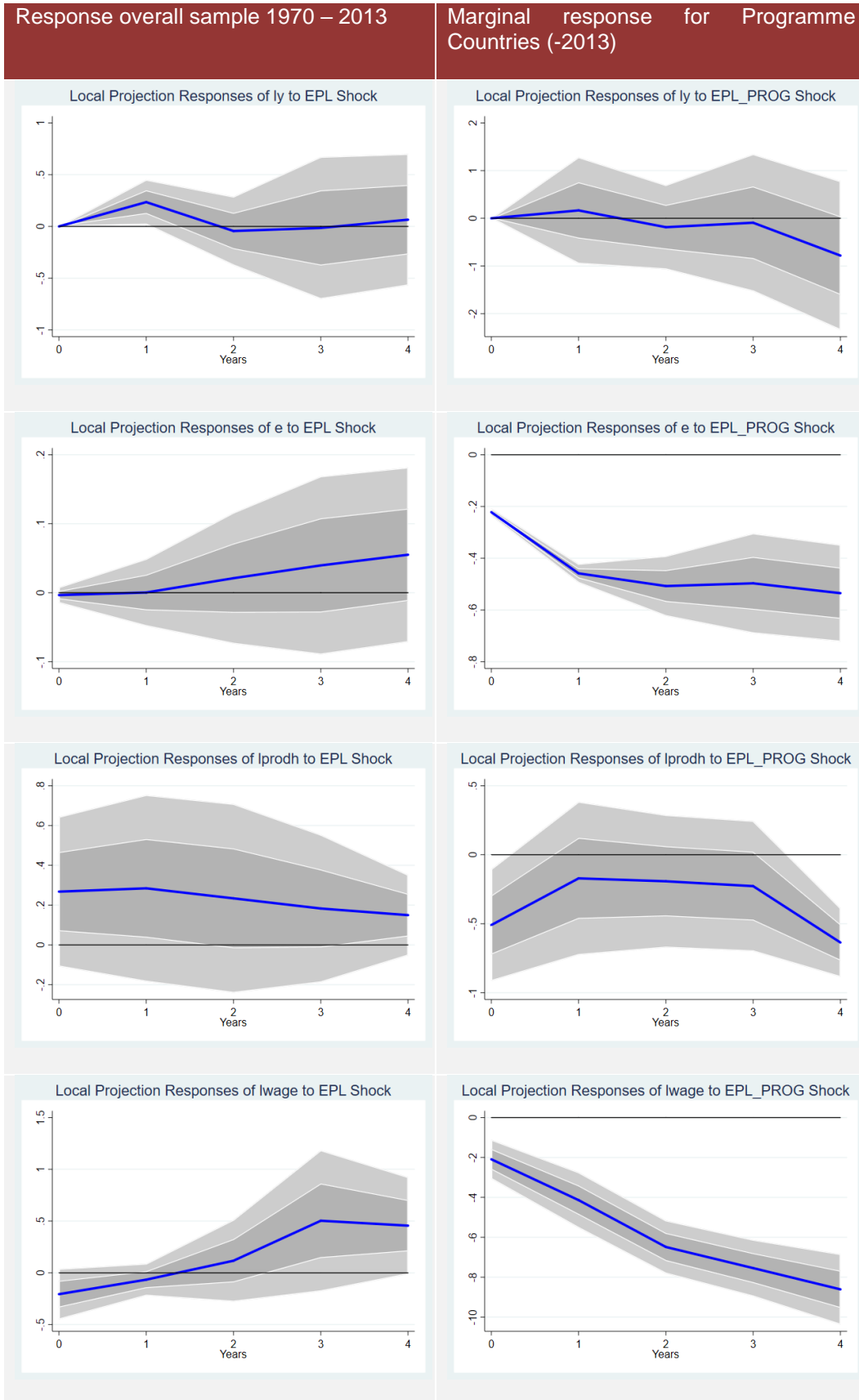**Figure 25: Local projection response of output, employment, productivity and wages to a relaxation of employment protection**

We find that on average there are no statistically significant short-to-medium-term effects for new social security such as EPL in regular and part-time workers on output, employment, productivity and wages on the overall sample (Figure 25, left panels). As underlined by the extant literature, however, the effect is different according to the overall business cycle conditions, e.g. whether the country is in an expansion or a recession. This is evident by looking at the marginal effects in figure 25, right panels, for the programme years, which mostly pick-up the recession years 2010-14. In fact, much of the reform shocks for the 'programme' countries corresponded to periods of negative to zero GDP growth and negative output gap (figure 26), suggesting that EPL reforms have had little to no *marginal* negative impact on output and productivity (which were already negative because of cyclical conditions), whereas they had a negative and statistically significant impact during the programme years on employment and wages.

Figure 26: Cyclical GDP component for Greece and Portugal
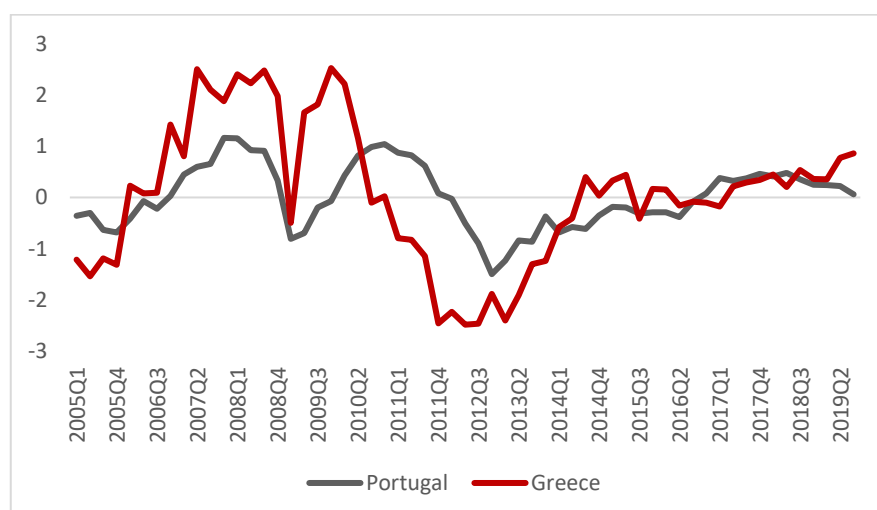
Source: NIESR based on Hodrick-Prescott filter (lambda=1600 for quarterly data)

While during a recession, wages would not necessarily adjust as stringent job protection may partly discourage firms from laying off workers (Bentolila and Bertola 1990; Duval and Furceri, 2018), undoing EPL may trigger an exogenously-driven adjustment process with consequent layoff bringing less employment and lower wages overall. Particularly, among the programme episodes (with Greece possibly being the main driver) wages fell as much as 8 per cent on year 4.

Figure 27: Results of the local projections of output, employment, productivity and wages to a reduction in unemployment benefits
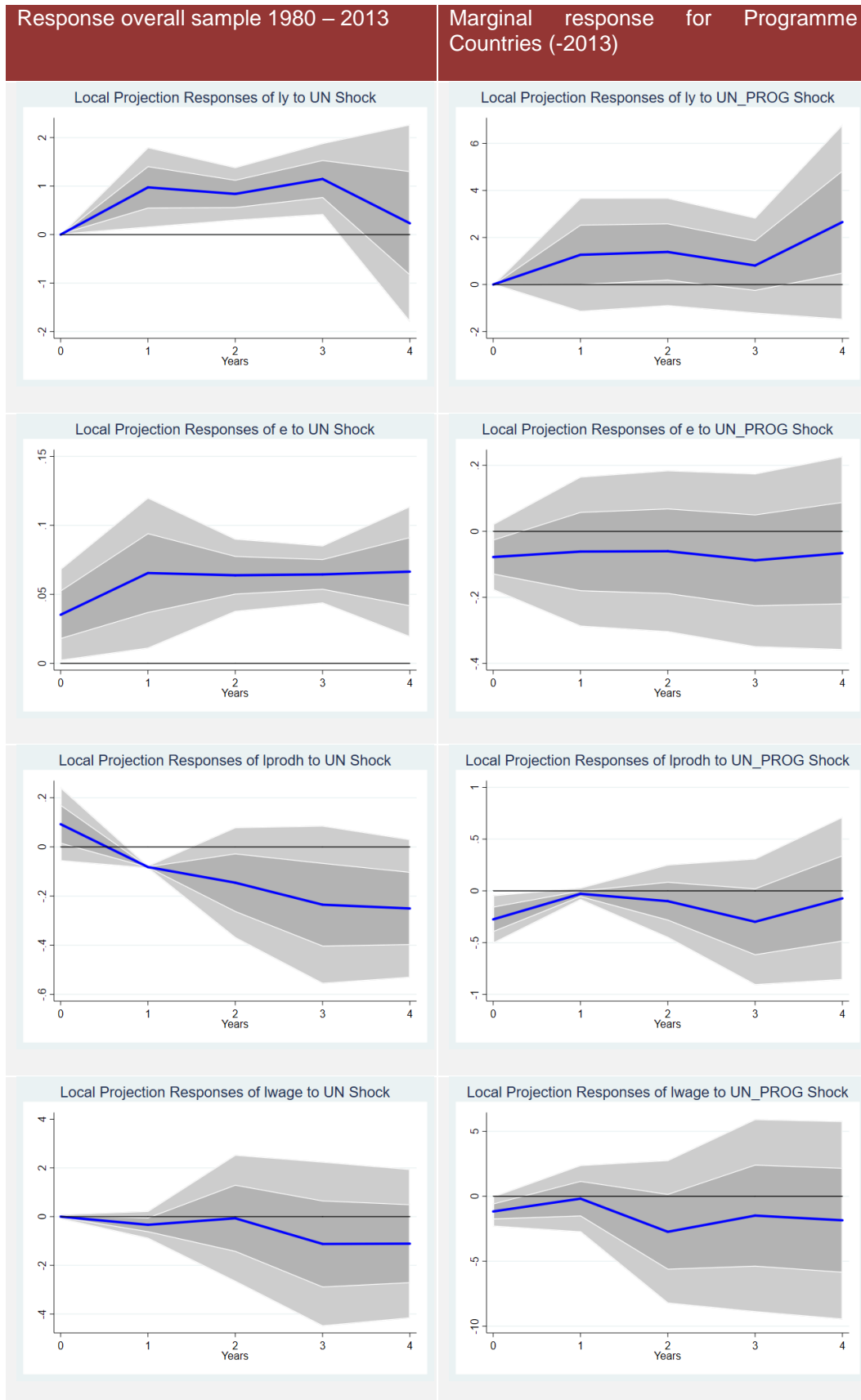
Finally, major unemployment benefit reforms are found to have statistically significant effects on employment. The effects are found to materialize gradually and mostly levelling off after 2-3 years (Figure 27). By contrast, the effect of unemployment benefit reforms on output and wages is not statistically significant or anyway negligibly small. The effect of the unemployment benefit reform shocks on programme countries is found to be almost not significant.

As a robustness check, particularly to have comprehensive coverage of the consolidation plan covering the period up until 2018, including the third MoU in Greece, as well as the dynamic response to macroeconomic and labour changes in other EU countries not affected by the economic adjustment programs, we resort to the newly established dataset by Campos et al (2018) which collects data covering the reform experience of the 28 EU members between 1990 and 2018.

The focus here is not exclusively around the prompted economic adjustment programmes as the result of structural shocks, as in the previous exercise. We adopt a panel framework, where the corresponding macroeconomic adjustment path in the 'programme' vs the remaining EU countries is evaluated to gauge the variation of the macroeconomic and labour market performance both across countries and over time.

Figure 28: Main labour market reforms in Greece
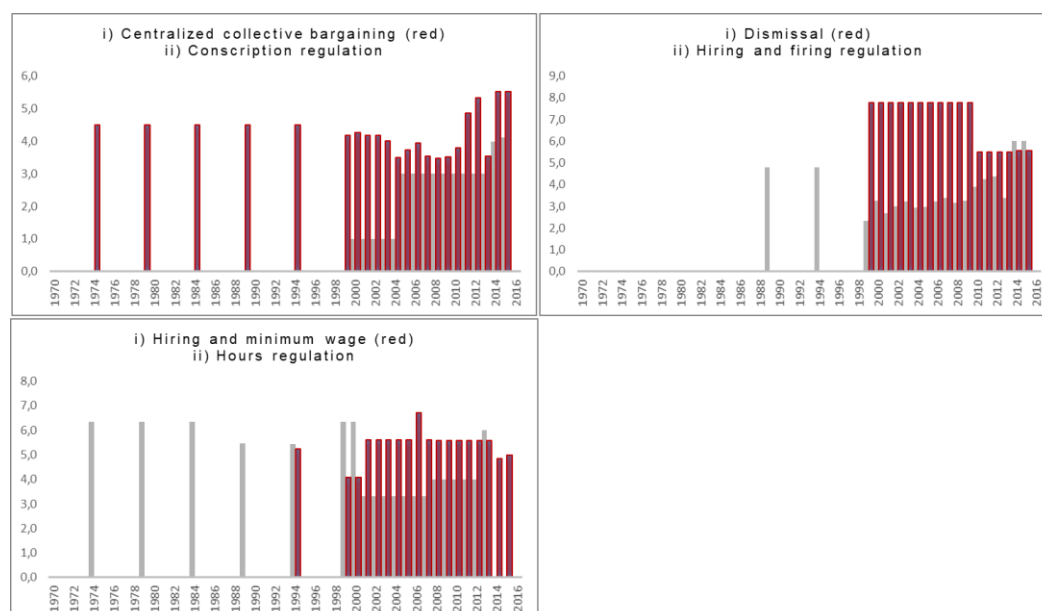
Source: Campos et al. (2018)

By looking at a subset of labour market structural indicators in Campos et al. (2018) in figure 28, it is evident that the Greek labour market underwent severe deregulation, particularly regarding collective dismissal, collective wage

bargaining and minimum wage, as of 2010/12. Those reforms correspond to the adjustments agreed in the context of the second Programme, confirming our previous findings, such as that deregulation prompted layouts and wage adjustments, helping explain why the marginal effect of those reforms on variables such as wages and employment is negative.

Using the same cross-sectional sample as before, including non-EU countries as control, we estimate the following baseline panel regression with country and period fixed effects over the period 1990-2018.

$$dw_{i,t} = \alpha_i + \gamma_t + \beta_1 dy_{i,t} + \beta_2 dGI_{i,t} + \beta_3 Bud_{i,t} + \beta_4 \pi_{i,t} + \beta_5 EPC_{i,t} + \sum_{j=0}^{3} \beta_{6j} Reform_{i,t+j} + e_{i,t} \qquad (2)$$

where w represent wages, y is real GDP, $prodh$ productivity per hour, GI government investment, Bud budget balance, π is inflation and EPC is a composite indicator of EPL governing collective dismissal from the OECD (see Campos et al., 2018). We also use some reform dummies $Reform$ (and subsequent lags) to distinguish the macroeconomic adjustment path in Greece from other consolidation programs. In doing so, we employ the indicator by Laeven and Valencia (2008, 2010), as collected by Campos et al. (2018), which – over the entire sample – mainly pins down Greece in 2012 as a recorded episode of sovereign debt default (for a discussion on sovereign debt default and private sector involvement, see Alcidi and Capolongo, 2020). In the figure below, we plot the beta coefficient which corresponds to the average response of wages starting from the time the reform was implemented (t=0), up until three years after (t=3). This corresponds to the plot of the coefficient β_{6j} in equation (2).

The results in Figure 29, yet again suggest that the wage adjustment in Greece tended to behave differently from the average wage in other adjustment programmes.[9]

Figure 29: Average evolution of wage growth following financial adjustments

Sovereign debt default / Greece

Consolidation programs
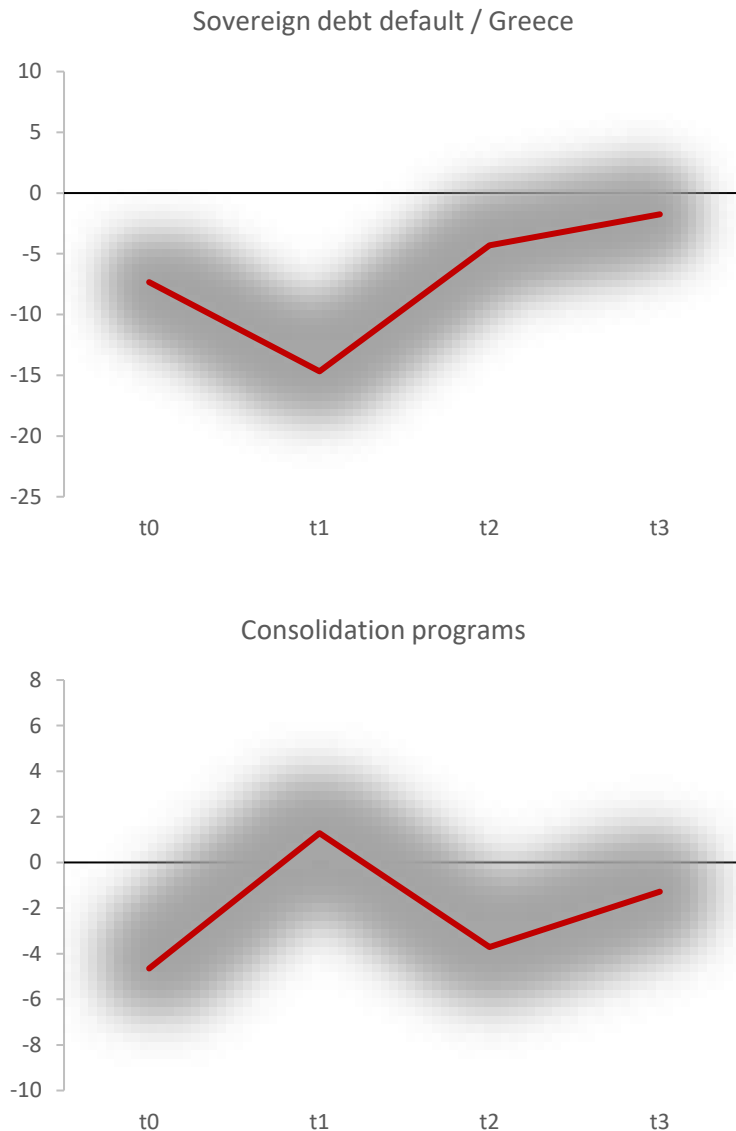
Source: NIESR calculations based on the results of equation (5). The shaded area accounts for ±2*standard errors.

In table 4, finally, we look changes in real wages as the dependent variable, which we regress on a series of time-invariant dummies obtained by interacting proxies for labour market reforms, such as the Fraser Institute Labor Market Regulations Index, and the new database of financial reforms of Abiad et al. (2016), both obtained from Campos et al. (2018). In all cases, the higher the index, the stronger is the intensity of the reform. Similarly to equation (2), we use a set of controls, such as real GDP (y), productivity per hour ($prodh$), government investment (GI), budget balance (Bud), inflation (π) and a composite indicator of EPL governing collective dismissal from the OECD (EPC).

The results confirm that, while on average, tighter labour market legislation (EPC) reduces wage growth as expected, the Index for labour market reforms had on average a positive effect on wages (see Macchiarelli et al. 2019). This seems to be the case for all the three columns in Table 4. In the case of the adjustment programmes, wage growth seemed to have been positively affected by labour market reforms and negatively by financial market reforms. In that sense, one could read the below by saying that the wage adjustment in the programme countries was due both to the direct and indirect effect of the reduction in public sector salaries and the reduction in minimum wages, which were part of the programmes, as well as the exceptional drop in domestic demand also as the result of other factors, such as confidence, for instance. It remains difficult however to ascribe the dynamic of wages solely to structural labour market and financial reforms given the presence of non-linearities explained by the unprecedented depth of the recession and its duration.

Table 4: Panel results (dependent variable wage %)

	D: Sovereign Debt default		D: Systemic banking crisis		D: Consolidation Programs	
dy	0.364	***	0.346	***	0.197	*
$dGip$	0.001		0.007		-0.009	
π	-0.072		-0.092		0.256	
Bud	0.001		0.001		0.002	
EPC ($OECD$)	-1.270		-1.396		-1.623	*
C	5.578		5.218		4.944	
Labour Market Reform (Fraser)	0.710	*	0.851	**	0.734	*
Labour Market Reform X D	-0.753		-0.830		1.566	**
Financial Market Reforms10 (Abiad et al.)	-3.165		-0.344		-0.167	
Financial Market Reforms10 X D			0.824	*	-1.486	***
Cross-section fixed (dummy variables)	YES		YES		YES	
Period-fixed (dummy variables)	YES		YES		YES	
Adjusted R-squared	0.400		0.385		0.463	
Sum squared residuals	794.492		809.978		707.733	
Log-likelihood	-439.273		-441.309		-427.073	
F-statistic	4.791		4.463		5.762	
Prob(F-statistic)	0.000		0.000		0.000	

Source: NIESR

4.2.1 Wage equation

In their 2015 study examining the effect of the first two economic adjustment programmes, Gros et al. (2015) found that an internal devaluation did take place through a fall in nominal wages, but this did not feed proportionally through to lower prices because of an increase in other costs and the fact that the price of imported goods naturally remained stable. They also found that the small size of the traded sector in Greece meant that the internal devaluation was less effective than in other programme countries. Looking empirically at the evolution of Greek macroeconomic performance over time, it is essential to assess the stability of the Greek wage equation, particularly as far as the elasticity to the expected inflation and labour market conditions are concerned, before and after the different Programmes.

Based on the economic time-series for Greece, we estimated several variants of a wage equation. The latter is used to inform how changes in the elasticity to vary labour market conditions could be used in the model, as well as to draw conclusions about the adjustment programmes in Greece over time.

Following Blanchard (1998), the first wage equation we estimate is

$$log\, w_t = \alpha + log\, \pi_t^e + (1 - \lambda)(log\, w_{t-1} - log\, \pi_{t-1}) + Z_t - \beta\, u_t + \epsilon_t \qquad (3)$$

where π_t^e is a measure of expected inflation, Z_t is a proxy for productivity and u_t is the unemployment rate.

A second variant is a hybrid Phillips relation, of the New Keynesian type, assuming that

$$log\, \pi_t = \alpha_0 + \alpha_1 log\, RULC_t + \alpha_2 IMPS_t + \alpha_3 log\, \pi_t^e + \alpha_4 \pi_{t-1} + \theta_t \qquad (4)$$

where $RULC$ is real unit labour cost defined as $w_t e_t / y_t$, $IMPS$ are imports expressed as a percentage of GDP, and e is the number of employees (thousands).

Finally, we estimate our NiGEM version of the wage equation, which assumes that

$$logw_t = logw_{t-1} + \beta_1 + \beta_2 FOC_{1,t} + \beta_3 log\pi_t + \beta_4 \pi_{t-1} + \beta_5 u_{t-1} \qquad (5)$$

Where the unit labour cost equation is measured as: $FOC_1 = logw_{t-1} + \left(\frac{1-\sigma}{\sigma}\right) techl_{t-1} - (1.0/\sigma) * log(cp_t/(e_{t-1} * hours_{t-1}))$

and the labour demand equation is $cp_t = cap_{t+1}$, where, everything else being equal, $techl$ is labour augmenting technology, cp is consumer prices and cap stands for capacity utilization.

All wage equations are estimated using Dynamic OLS, over the sample 1999Q1-2018Q4 to circumvent any issues with the non-stationarity of the time-series. Looking at the dynamic of equation (3) over the period 2010-18 (figure 30), we find that, not only the efficiency of the labour market has changed after the reforms, after 2012 in particular, but also – based on the result for productivity – that the austerity measures likely impacted employment by a similar degree. This calls for incorporating into our wage determination equation the impact of the level of long-term unemployment and low growth, captured in measures of labour market slack. Though unemployment remains the main indicator of slackness, more indicators can also be considered, such as involuntary part-time employment and hours worked per person.[10]

Figure 30: Stability of the parameters in the wage equation
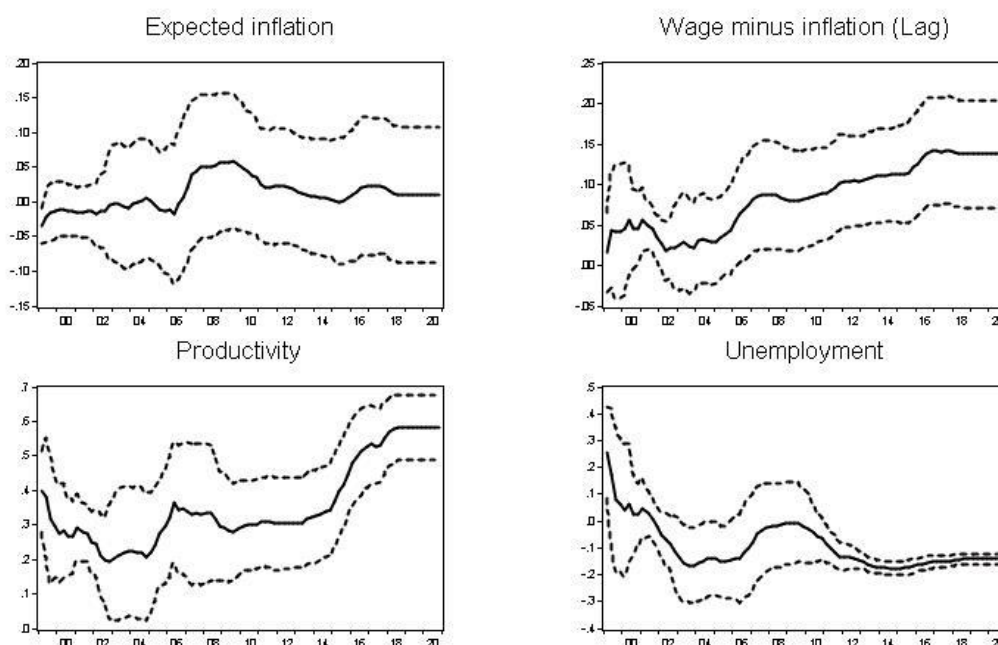
Source: NIESR

Secondly, for euro area countries, a negative impact of slack on wages may have been deepened and prolonged by an adjustment in inflation expectations. Despite the risk of de-anchoring inflation expectations owing to a prolonged

---

[10] Bonam et al. (2018), for instance, conveniently propose a wage Phillips curve with time-varying parameters which considers alternative measures for labour market slack, namely the European Commission's labour shortage indicator. The latter is based on a survey conducted by the European Commission in which firms are asked to what extent labour shortage is considered an important factor slowing production. In contrast to the unemployment gap, which requires making assumption on the steady-state unemployment, the labour shortage indicator is not prone to estimation error/bias and might, therefore, better capture changes in perceived labour market demand conditions.

period of observed inflation, expectations in Greece did not appear to have been particularly depressed by the austerity programs themselves, as the coefficient in the wage equation has remained broadly unchanged overtime.

Looking at the different wage equations, all variants further point to a break in the fourth quarter of 2012. This is fairly consistent across the estimation, whatever form of the wage equation we consider, particularly if the sample starts after Greece's euro adoption. Based on our previous discussion, one might remember that, for Greece, most labour market reforms happened in 2012. The year 2012 also coincides with the 2nd Programme. Consistent with our previous evidence and the stakeholders' consultation, both pointing to 2012 as the year after which wages effectively collapsed, we look at the results of the wage equation by splitting the sample before and after 2012Q4.

Figure 31: Inflation expectations and headline inflation in Greece
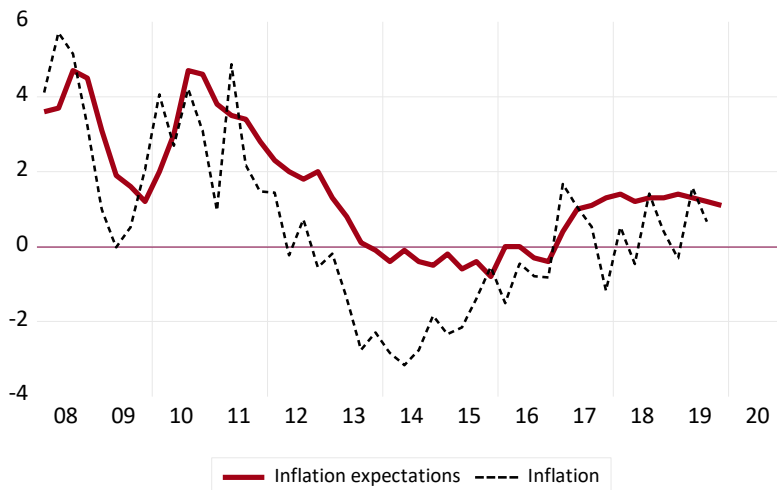
Source: NIESR, Ifo inflation expectations for Greece

Looking at different subsamples, pre and post 2012, we confirm our previous finding that real wages remained anchored to labour productivity. Combined with our previous findings on the local projections this seemed to be mainly driven by the number of employees. In this sense, inflation expectations did not seem to be a key driver of nominal wage developments in Greece.

Box 4 – INTERNAL DEVALUATION

In this box we will concentrate on the efficiency of internal devaluation policies aimed at enhancing Greek economic competitiveness. In so doing, we will focus on developments in Unit Labour Costs (ULC), defined as wages over per capita productivity.

An internal devaluation typically denotes a situation where both wages and prices fall because devaluation through the exchange rate is not available, as is the case for countries of a currency union, such as the euro area.

The optimal path for wage repression, labour market reforms, and restoring price competition involves balancing two seemingly conflicting objectives (Belke and Gros, 2016). The first one is to restore competitiveness with the external sector; the second is to mitigate the possible deflationary effects and cushion any wealth redistribution away from labour. Recent studies like Alcidi and Gros (2019) have contested the claim that – at least for the case of Greece – an internal devaluation could at all be successful in redirecting productive sources towards the exporting or tradable sector. This is because of the small size of the traded sector in Greece.

As argued elsewhere in this report, on the contrary, a more practical, effective and less costly solution would have been to focus on a strategic investment plan.

According to the first Memorandum of Understanding the main objective for the medium-term was to "improve competitiveness and alter the economy's structure towards a more investment- and export-led growth model". This objective was reaffirmed in the following two Memoranda of 2012 and 2015 (Passas and Pierros, 2017).

Much of the focus on competitiveness exhausted itself in two issues: a hiatus in the process of collective bargaining between the national social partners, as well as – following the hiatus - reduction of minimum wages and pension reductions decided by government decree (Passas and Pierros, 2017). Wage compression was considered essential for fostering competitiveness, given that the internal devaluation policy aimed strictly at the enhancement of the cost competitiveness.

Having said that, it is clear that there is no such a thing as a linear relationship between internal devaluation and export-growth (Perez and Matsaganis, 2019). In fact, barriers to fostering an export-led growth strategy existed, mainly

identified in the existence of trade costs. Such costs were linked to lower export prices in the euro periphery relative to domestic prices (Petroulakis, 2017).

Figure 32: Changes in relative unit labour cost (all economy) since 2010 in selected countries
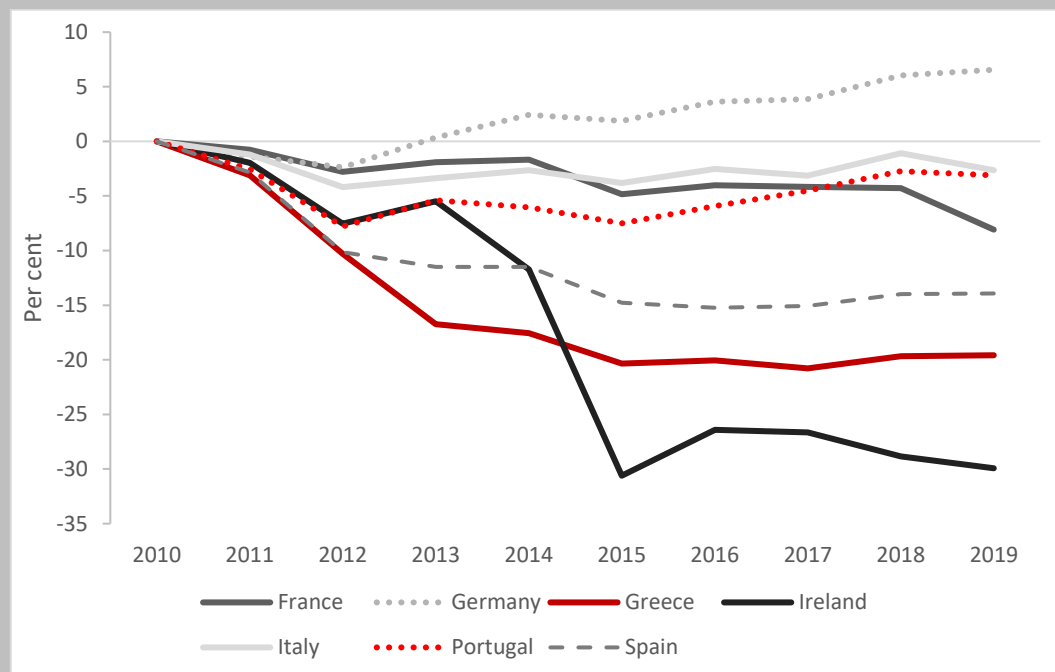
Source: NIESR based on OECD data. ULC index = 100 in 2015.

The evolution of the ULC among the selected euro area countries below is quite telling.

First, the lack of any symmetry in the adjustment based on the idea that there exists no good or bad imbalances (De Grauwe 2016).

Secondly, it needs to be asked whether such internal rebalancing processes generated the desired boost in exports. It is highly debatable whether cost competitiveness, and in particular the ULC, is indeed the appropriate measure of competitiveness. Uxó *et al.* (2014), for instance, point out to the impact of internal devaluation was mainly on profit margins and taxes. In particular, they argue that in the case of Greece, Spain and Portugal internal devaluation instead of enhancing competitiveness, increased firms' profit margins through a labour cost compression, *de facto* eroding any competitiveness gains.

In fact, while unit labour cost was substantially reduced, prices in Greece fell by more than 5% (see also Petroulakis, 2017). In this sense, the failure of the internal devaluation to improve Greece's export performance resulted from increasing costs and placing new risks and burdens on the productive economy (Pelagidis, 2014).

Figure 33: Evolution of year-on-year inflation since 2010 in selected countries
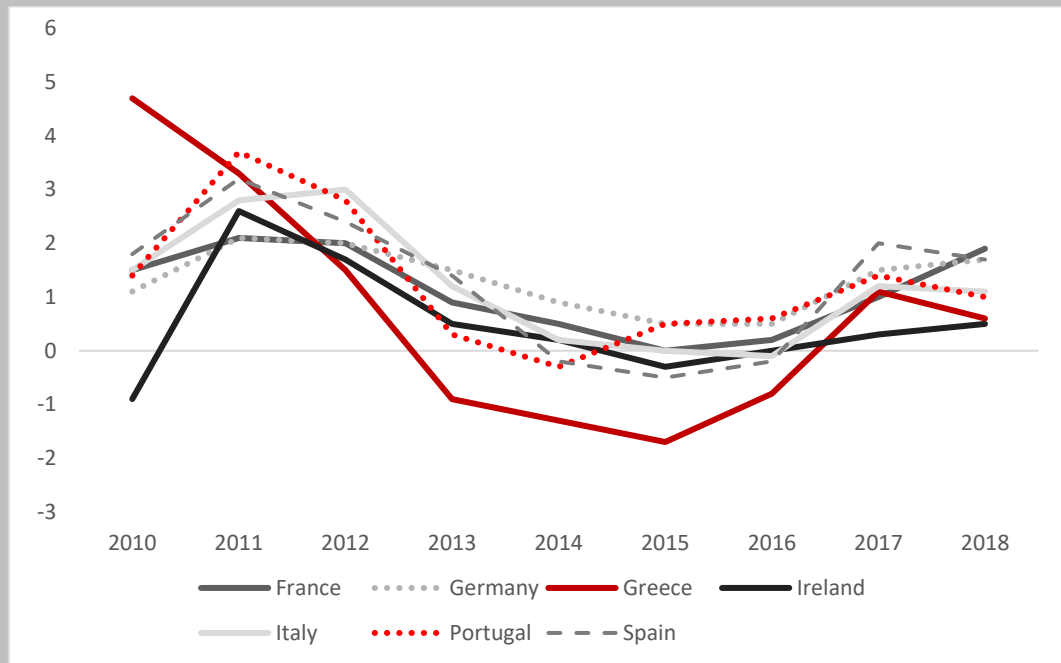
Source: NIESR based on OECD data

Figure 34: Changes in Greek manufacturing, retail trade and exports since 2010
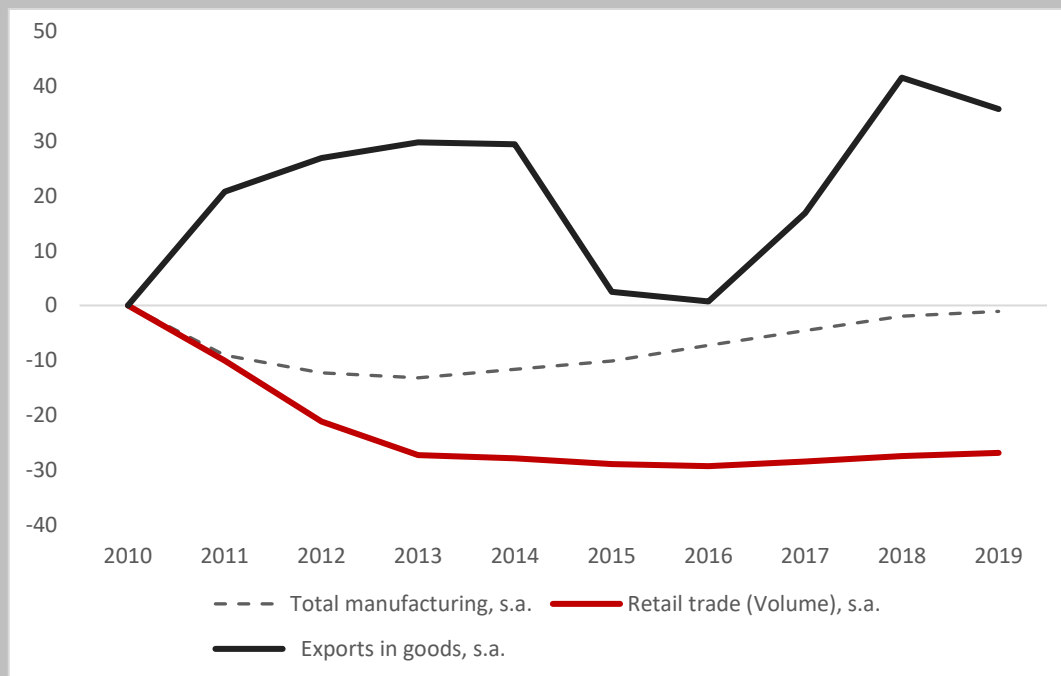
Source: NIESR based on OECD data

The increasing cost of financing corporate loans in Greece further undermined the so-called aim for an export-led recovery (Pelagidis, 2014). The reluctance

of the Greek government to adhere to the agreed reform agenda in the first place, increased the risk premium putting companies at disadvantage given the ensuing higher cost of external finance.

5. CONCLUSION

The study answered the following questions:

To what extent was the design and outcome of the macroeconomic trajectory in the programmes appropriate to restore market access and to achieve the required adjustment of the economy? To what extent was the time horizon appropriate to achieve the objectives?

The programmes were ultimately successful in restoring market access and achieving the required adjustment of the economy. However, their initial calibration did not take appropriate account of features of the Greek economy or their social costs. This meant that successive rescue packages were needed.

The reduction in public investment turned out to be much larger and more persistent than planned. Public investment possibly served as an adjustment variable to improve the budget balance more rapidly, as the government was faced with political pressure to prevent the level of public consumption from decreasing unnecessarily. This was confirmed in our stakeholders' interviews, as well as previous analyses, e.g. OECD, which noted that the government found it easier to cut investment in infrastructures than to cut wages or pensions immediately.

Based on our first simulation about the demand-side and supply-side effects (through the capital stock and hence the economy's potential) of a decrease in public investment, we conclude that it was economically ill-advised to focus such a large part of the deficit reduction on public investment cuts. In retrospect, the adjustment programmes should have included measures to ring-fence public investment given its impact on the long-term prosperity of the country. A simulation that achieves the same macroeconomic effort which is rather skewed on public consumption shows that, over a ten-year horizon, Greece potential output would have increased by 1.5 per cent and the debt to GDP ratio reduced.

The adjustment programmes, combined with the intensifying of the sovereign debt crisis, meant it took about ten years for households and businesses to go back the confidence levels observed before the first programme. Because the public expenditure multiplier was largely underestimated – as well documented

by the literature now – the government's decision to stop providing some essential services to households and increase taxes, resulted in a much larger than expected economic slump. This led in turns to a higher risk premium, lower productivity and lower household and business confidence.

We do not find any compelling evidence that a longer adjustment path would have improved the trade-off between GDP growth and fiscal consolidation. We observe that the fiscal consolidation mostly occurred at a regular pace between 2010 and 2016. In a counterfactual of a longer adjustment path, we do not find that the severity of the recession would have been significantly reduced. This is because the fiscal multiplier was probably not higher in 2010 than in the later years and the scale of the adjustment required meant that the consolidation had to start at a good pace from day one.

Were the fiscal targets set appropriately in view of the adjustment needs and the financial envelope? To what extent and how were the fiscal targets achieved? Where the fiscal and macroeconomic targets compatible? Was sufficient attention given to the quality of the adjustment?

Answers to these questions also followed from the counterfactual analysis described above, together with the stakeholder consultation. In particular, the findings paint a mixed picture which calls for a deeper reflection of the Greek experience. While across the three programmes progress has been uneven at times, with some targets revised or even missed (see also the CEPS report on the same issue), the results of this exercise suggest that at the macro-level the fiscal targets were reached, including regaining access to financial market through lower government borrowing costs. This, however, came at the expense of some key areas, such as government investment, hence putting at risk confidence and the long-run economy's potential.

The cost of the adjustment in terms of GDP loss and other economic measures like unemployment was much larger than expected. But the only possible alternatives to an official programme were likely to have been disorderly and almost certain to have resulted in the economic performance of Greece being significantly worse and with even higher social cost than the actual experience.

Consistent with our findings, the stakeholders' engagement exercise revealed a general consensus among those consulted that the timing, quality, duration and balance of the adjustment and the programme(s) objectives (considering

the overall adjustment across the three programmes) were not fully appropriate. This includes the extent to which the social impacts of the reforms were appropriately taken into account.

To what extent were labour market and wage policies successful in terms of restoring price and cost competitiveness?

Answers to these questions followed from the empirical assessment and cross-country analysis, as well as the stakeholder consultations. The picture suggests that nominal wage growth consistently adjusted to economic performance particularly since 2010. In 2012 Greek ministers agreed to deep cuts in the minimum wage in return for the second rescue package, imposing nominal reductions on the standard minimum monthly wages and public-sector wage freezes conditional on unemployment falling by more than half (from 25 per cent to 10 per cent). Such interventions reduced labour market nominal rigidities which would have otherwise prevented a fuller wage adjustment, particularly if looked in the perspective of previous recession episodes. Panel results also suggest that Greek wage adjustment tended to behave differently from the average wage reaction in other adjustment programmes post-2010.

However, wages have struggled to gain consistent momentum during the subsequent recovery. The adjustment on wages hit an already besieged supply of labour after several years of recession.

How did prices respond to the wage adjustment? Have changes in relative wages and prices been supportive of the sought-after economic reallocation towards more profitable sectors?

Based on the analysis described above we explained in detail how product market conditions were affected and how prices responded to wage developments. Given the tendency of some traded prices to be more closely related to foreign rather than domestic market conditions, adjustment likely occurred through capital moving towards profitable sectors.

Looking at the behaviour of wages in Greece over time, we find that, not only the efficiency of the labour market has changed after 2012, but also – based on our previous results – the austerity measures impacted wages and employment by a similar degree. On the contrary, inflation expectations did not seem to be a key driver of nominal wage developments in Greece. In the light of the labour market adjustment, margins rose and exports did not expand as was hoped.

We find that Employment Protection Legislation (EPL) reforms had little to no marginal negative impact on output and productivity in the Programme countries, as these countries were already in recession, whereas they had a negative and statistically significant impact during the programme years on employment and wages. By contrast, estimates suggest that both employment and labour productivity increased after product market reforms (PMRs) .It should be kept in mind that, in the case of Greece, much of the "structural reform shocks" that occurred after the first Programme focused on essentially relaxing labour legislation, while all PMR reform changes (including reforms in the sectors of Electricity, Gas, Telecommunications, Postal Services, Rail Transport, Air Transport, Road Transport) – as recorded by the IMF – occurred in Greece before 2009.

Consistent with our previous results, there was no clarity across stakeholders on the expected effect of the reforms in terms of the allocation to the more efficient sectors, nor was the effect on firms' competitiveness – as the result of Greece deregulation effort – clear across the participants.

The stakeholder engagements suggest the labour market reforms were successful in promoting wage reductions and adjustments, thus spurring (sectoral) competitiveness. According to the stakeholders' consultation, as well, despite the observed labour and product market reforms' effort, manufacturing production and exports did not improve, mainly as the result of the small size of the traded sector itself.

In the design of the different measures, have the potential economic and social implications been identified and taken into account considering the conditions of economic and financial stress?

We assessed this question largely through our counterfactual analysis, considering whether the original expectations of the programme were somewhat 'too optimistic'. We also carefully engaged on this issue through stakeholder engagement. A key question for the consultation (see Appendix 3) asked the extent to which the ex-post economic and social costs of the programmes in Greece would differ from their *ex-ante* analysis.

We find that, with an overall lower risk premium, Greek GDP would have been up to 7 per cent higher and the ratio of debt-to-GDP would have been lower by up to 23 percentage points. This would have prevented investment not to fall by as much, leading to an increase in the economy's capacity. Between 2010 and 2012, the Greek 10-year government bond yield increased from 6 to 36 per cent, with such a punitive rate illustrating a general loss of confidence in

the ability of the Greek government to service its debt. This marked also the beginning of the sovereign debt crisis with government borrowing costs soaring in other euro area countries. The Greek debt was subsequently restructured and a second adjustment programme was implemented. In a second counterfactual scenario, we assumed that Greek risk premium starting from 2010 did not soar up as much as it did. We achieve this by calibrating Greek borrowing costs to match the average risk-premium of other countries (Ireland, Portugal plus Spain). We speculate that such a scenario would have been possible had local and international authorities acted in a concerted way sooner, including an earlier last-resort guarantee provided by the ECB - which arrived in 2012.

The exercise thus suggests there were some judgment errors in overlooking some structural/long term issues, such as the size of the tradable sector in Greece – besides the magnitude of the multipliers – thereby impeding a quicker GDP pick-up. The labour and product market reforms, while necessary to restore competitiveness, were not found to have significant positive effect on GDP growth, at least in the short-term.

REFERENCES

General literature

Abiad, Abdul D Furceri, and P Topalova (2016). The macroeconomic effects of public investment: Evidence from advanced economies. Journal of Macroeconomics 50 (2016): 224-240.

Alcidi, C, A Belke, L Coutinho, A Giovannini and D Gros (2014), State-of-Play in Implementing Macroeconomic Adjustment Programmes in the Euro Area, Policy Note, Directorate General for Internal Policies, Economic Governance Support Unit, European Parliament, Brussels, February, and Economic Policy, CEPS e-book, CEPS, Brussels, March.

Alcidi C and A Capolongo (2020), Sovereign debt sustainability in Greece during the economic adjustment programmes: 2010-2018, Directorate-General for Economic and Financial Affairs, European Commission

Alcidi C., and Gros, D. (2019). Public debt and the risk premium, Centre for European Policy Studies, No 2019-06

Alesina, A., Favero, C. and Giavazzi, F. (2019), '*Austerity: when it works and when it doesn't*', Princeton University Press.

Alesina, A., Prati, A., & Tabellini, G. (1989). Public confidence and debt management: A model and a case study of Italy (No. w3135). National Bureau of Economic Research.

Altavilla C., L. Burlon, M. Giannetti and S. Holton (2019), Is There a Zero Lower Bound? The Effects of Negative Policy Rates on Banks and Firms, ECB Discussion Paper.

Anderson, D., Barkbu, B., Lusinyan, L., & Muir, D. (2014). Assessing the gains from structural reforms for jobs and growth. *Jobs and Growth: supporting the European recovery, IMF Chapter*, *7*, 151.

Atinasi, M. G. and A. Klemm (2014). The growth impact of discretionary fiscal policy. ECB Working Paper No. 1697, July 2014.

Auerbach, A.J., and Y. Gorodnichenko (2012a). Fiscal Multipliers in Recession and Expansion. Fiscal Policy after the Financial Crisis, ed. by A. Alesina and F. Giavazzi. (Chicago: University of Chicago Press).

Auerbach, Alan, and Youri Gorodnichenko (2012b) Measuring the Output Responses to Fiscal Policy." *American Economic Journal: Economic Policy* 4 (2): 1–27.

Balima Hippolyte W. and Amadou N. R. Sy (2019), The Impact of Bailouts on the Probability of Sovereign Debt Crises: Evidence from IMF-Supported Programs, IMF Working Paper WP/19/2

Bansal R. and Shaliastovich I. (2010) "Confidence Risk and Asset Prices," American Economic Review, American Economic Association, vol. 100(2), pages 537-41, May.

Barrell, R., Holland, D. and Hurst, I. (2012), "Fiscal multipliers and prospects for consolidation", OECD Journal: Economic Studies, Vol. 2012/1. http://dx.doi.org/10.1787/eco_studies-2012-5k8x6k5wc58x

Batini, N., G. Callegari, and G. Melina (2012). Successful Austerity in the United States, Europe and Japan. IMF Working Paper No. 12/190.

Batini, N., L. Eyraud, and A. Weber (2014). A simple method to compute fiscal multipliers. IMF Working Paper No. 14/93.

Baum, A., and G.B. Koester (2011). The impact of fiscal policy on economic activity over the business cycle – evidence from a threshold VAR analysis. Deutsche Bundesbank Discussion Paper Series 1: Economic Studies, No. 03/2011.

Baum, A., Checherita-Westphal, C. and Rother, P. (2012), 'Debt and growth: new evidence for the Euro Area', ECB Working Paper, no. 1450, July.

Belke A. and D. Gros (2016), Optimal Adjustment Paths in a Monetary Union, CEPS Working Document No. 424/ July

Belke A and D Gros (2017), Greece and the Troika – Lessons from international best practice cases of successful price (and wage) adjustment, CEPS Working Paper No. 2017/05, May.

Bergh, A., & Henrekson, M. (2011). Government size and growth: a survey and interpretation of the evidence. *Journal of Economic Surveys*, *25*(5), 872-897.

Blanchard, O. (2015), 'Greece: Past Critiques and the Path Forward', IMF blog 9 July 2015.

Blanchard, O. and Leigh, D. (2013a), 'Growth forecast errors and fiscal multipliers', *IMF Working Papers*, WP/13/1, January.

Blanchard, O. and Leigh, D. (2013b), VoxEU article https://voxeu.org/article/fiscal-consolidation-what-speed

Blanchard, Olivier, and Francesco Giavazzi.(2003) "Macroeconomic Effects of Regulation and Deregulation in Goods and Labour Markets." *Quarterly Journal of Economics* 118 (3): 879–907

Brugnolini L. (2018) "About Local Projection Impulse Response Function Reliability," CEIS Research Paper 440, Tor Vergata University, CEIS.

Cacciatore, Matteo, Romain Duval, Giuseppe Fiori, and Fabio Ghironi. 2016a. "Short-Term Pain for Long-Term Gain: Market Deregulation and Monetary Policy in Small Open Economies." *Journal of International Money and Finance* 68 (November): 358–385.

Carnot, N., and F. de Castro (2015). The discretionary fiscal effort: An assessment of fiscal policy and its output effects. European Economy Economic Paper No. 543.

Chowdhury, A. (2011). Do Stock Market Risk Premium Respond to Consumer Confidence? Marquette University College of Business Administration, Working Paper 2011-06

Checcherita, C. and Rother, P. (2010), 'The impact of high and growing government debt on economic growth an empirical investigation for the euro area', ECB Working Paper series No 1237, August.

Conti, A M, E Guglielminetti and M Riggi (2019). "Labour productivity and the wageless recovery", Temi di Discussione, Bank of Italy Working paper series, 1257, December.

Corsetti, G., and G.J. Müller (2015). Fiscal multipliers: Lessons from the Great Recession for small open economies. Swedish Fiscal Policy Council Report 2015/2.

Cotarelli, C. and Jaramillo, L. (2012), 'Walking hand in hand: fiscal policy and growth in advanced economies', *IMF Working Papers*, 137, May.

Christopoulou R and V. Monastiriotis (2014), The public-private duality in wage reforms and adjustment during the Greek crisis, Research Paper No. 9, Crisis Observatory

Daly, M C and B Hobijn (2014), "Downward Nominal Wage Rigidities Bend the Phillips Curve", *Journal of Money, Credit and Banking* 46(S2): 51- 93.

Dennis Bonam and Jakob de Haan and Duncan van Limbergen, 2018. "Time-varying wage Phillips curves in the euro area with a new measure for labor market slack," DNB Working Papers 587, Netherlands Central Bank, Research Department.

Daouli, J., Demoussis, M., Giannakopoulos, N. (2017). The wage curve before and during the Greek economic crisis. *Empirical Economics* 52, 59–77.

Duval R, and D Furceri (2018), The Effects of Labor and Product Market Reforms: The Role of Macroeconomic Conditions and Policies, *IMF Economic Review*, vol. 66(1), pages 31-69.

Duval, R, D Furceri, J Jalles, and H Nguyen (2016), A New Narrative Database of Product and Labor Market Reforms in Advanced Economies, IMF Working Paper, International Monetary Fund, Washington

Fournier, J. M., & Johansson, Å. (2016). The effect of the size and the mix of public spending on growth and inequality. OECD

Gourinchas, Pierre-Olivier, Philippon, Thomas and Vayanos, Dimitri(2017) 'The analytics of the Greek crisis', *NBER Macroeconomics Annual*, 31 (1). pp. 1-81.

Gros, D., Adam, A., Alcidi, C., Belke, A., Lebre de Freitas, M., Moutos, T., Veiga, F. (2015) Expert Study on Export Performance and Internal Devaluation in the Context of a Performance Audit of the Greek Economic Adjustment Programme

Hantzsche, A., Kara, A., & Young, G. (2019). The economic effects of the UK government's proposed Brexit deal. The World Economy, 42(1), 5-20.

Hernandez de Cos, P., and Moral-Benito, E. (2013). Fiscal Multipliers in Turbulent Times: the Case of Spain. Banco de España, Documentos de Trabajo No 1309.

Holland, D. and Portes, J. (2012), 'Self-defeating austerity', *National Institute Economic Review*, No. 222 October 2012, ppF4 – F10.

In't Veld, J. (2013). Fiscal consolidations and spillovers in the euro area periphery and core. European Economy Economic Paper No. 506, October 2013.

Ioannides, Y. and Pissarides, C.'Is the Greek Crisis One of Supply or Demand?', Brookings Papers on Economics Activity, Fall 2015, 359 – 373.

Jordà, O (2005), Estimation and Inference of Impulse Responses by Local Projections, *American Economic Review* 95 (1): 161–82.

Jordà, Òscar, and Alan Taylor. 2013. "The Time for Austerity: Estimating the Average Treatment Effect of Fiscal Policy." NBER Working Paper, National Bureau of Economic Research, Cambridge, Massachusetts.

Kahn, R. (1931). The Relation of Home Investment to Unemployment. The Economic Journal, 41(162), 173-198. doi:10.2307/2223697

Kalozois, P. (2016). Cyprus, Accessing sovereign markets – the recent experiences of Ireland, Portugal, Spain, and Cyprus. ESM Discussion Paper Series/2: 50-62.

Klitgaard, T. & Higgins, M (2014). The balance of payments crisis in the euro area periphery, Current Issues in Economics and Finance, Federal Reserve Bank of New York, vol. 20.

Lenoel. C. (2019). Simulation of French 5-year fiscal plan. The World Economy. National Institute Economic Review 242. November 2017 F55-F57. Edited by Graham Hacche

Passas C and C. Pierros (2017), The Failure of Internal Devaluation and the Case of an Investment-led Strategy to Foster Competitiveness in Greece, Labour Institute G.S.E.E. Policy Brief / 14

Pelagidis T. (2014), Why Internal Devaluation is Not Leading to Export-Led Growth in Greece, Brookings Blog, September 12

Perez S. A. and M. Matsaganis (2019), Export or Perish: Can Internal Devaluation Create Enough Good Jobs in Southern Europe? South European Society and Politics, Volume 24, 2019 - Issue 2: Policy Reversals in Southern Europe in the aftermath of the Eurozone Crisis

Petroulakis F. (2017), Internal devaluation in currency unions: the role of trade costs and taxes, ECB Working Paper Series, No 2049 / April

Riera-Crichton, R., C. Veigh, and G. Vultein (2014). Fiscal multipliers in recessions and expansions: Does it matter whether government spending is increasing or decreasing? World Bank Policy Research Working Paper No. 6993.

Romer, C D., and D H. Romer (1989), Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz, In *NBER Macroeconomics Annual* 1989, edited by Olivier J. Blanchard and Stanley Fischer, 121–70. Cambridge, Massachusetts: MIT Press.

Romer, C D., and D H. Romer (2004), A New Measure of Monetary Shocks: Derivation and Implications, *American Economic Review* 94 (4): 1055–84.

Schneider, F. (2013). Size and Development of the Shadow Economy of 31 European and 5 other OECD Countries from 2003 to 2012: Some New Facts.

Available at: https://www.researchgate.net/publication/268185661_Size_and_Development_of_the_Shadow_Economy

Stock, J H., and M W. Watson (2007). Why Has U.S. Inflation Become Harder to Forecast? *Journal of Money, Credit and Banking* 39 (S1): 3–3

Suni, P. (2014). A Withdrawal from the euro area: Some Simulation Studies with the NiGEM Model (No. 39). The Research Institute of the Finnish Economy.

Uxó, J., Paúl, J. and E. Febrero (2014). "Internal Devaluation in the European Periphery: the Story of a Failure." Working Paper No. 2014/2, University of Castilla – La Mancha, Toledo.

Wolff, G. (2015), 'Olivier Blanchard fails to recognise two major IMF mistakes in Greece', Bruegel Institute blog.

Documents from European and international institutions

European Commission (2010a), [The Economic Adjustment Programme for Greece](#)

European Commission (2010b), [The Economic Adjustment Programme for Greece. First review - summer 2010](#)

European Commission (2010c), [The Economic Adjustment Programme for Greece. Second review - autumn 2010](#)

European Commission (2011a), [The Economic Adjustment Programme for Greece. Third review - February 2011](#)

European Commission (2011b), [The Economic Adjustment Programme for Greece. Fourth review - spring 2011](#)

European Commission (2011c), [The Economic Adjustment Programme for Greece. Fifth review - autumn 2011](#)

European Commission (2012a), [The Second Economic Adjustment Programme for Greece - March 2012](#)

European Commission (2012b), [The Second Economic Adjustment Programme for Greece - First Review December 2012](#)

European Commission (2013a), [The Second Economic Adjustment Programme for Greece - Second Review May 2013](#)

European Commission (2013b), [The second economic adjustment programme for Greece – 3rd review July 2013](#)

European Commission (2013c), [The second economic adjustment programme for Greece – 4th review](#)

European Commission (2015), Assessment of the request for stability support in the form of an ESM loan, 10 July https://ec.europa.eu/info/sites/info/files/2015-07-10_greece_art_13_eligibility_assessment_esm_en1.pdf

European Commission (2016), Compliance report - First review of the ESM Programme, 01 June, https://ec.europa.eu/info/sites/info/files/economy-finance/compliance_report_-_first_review_of_the_esm_programme.pdf

European Commission (2017a), Compliance Report ESM stability support programme for Greece Second Review June, https://ec.europa.eu/info/sites/info/files/compliance_report-to_ewg_2017_06_21.pdf

European Commission (2017b), The ESM Stability Support Programme for Greece, First and Second Reviews - Background report, July https://ec.europa.eu/info/publications/economy-finance/esm-stability-support-programme-greece-first-and-second-reviews-july-2017-background-report_en

European Commission (2018a), Compliance Report ESM Stability Support Programme for Greece, Third Review, 02 March, https://ec.europa.eu/info/sites/info/files/economy-finance/compliance_report_3r_to_ewg_2018_03_02_1.pdf

European Commission (2018b), Compliance Report ESM Stability Support Programme for Greece, Fourth Review, 23 June, https://ec.europa.eu/info/sites/info/files/economy-finance/compliance_report_4r_2018.06.20.docx.pdf

European Commission (2018c), Enhanced Surveillance Report – Greece, November, https://ec.europa.eu/info/publications/economy-finance/enhanced-surveillance-report-greece-november-2018_en

European Commission (2019a), Enhanced Surveillance Report – Greece, February, https://ec.europa.eu/info/publications/enhanced-surveillance-report-greece-february-2019_en

European Commission (2019b), Enhanced Surveillance Report - Greece, June, https://ec.europa.eu/info/publications/enhanced-surveillance-report-greece-may-2019_en

European Commission (2019c), Enhanced Surveillance Report – Greece, November, https://ec.europa.eu/info/publications/enhanced-surveillance-report-greece-november-2019_en

Fiscal Sustainability Report 2012. European Economy Institutional Paper, No. 8/2012.

Communication from the Commission to the Council on Assessment of the Budgetary Implementation in the Context of the Ongoing Excessive Deficit Procedures after the Commission's Services 2011 Autumn Forecast, COM(2012)4 final.

European Court of Auditors (2016). Further improvements needed to ensure effective implementation of the excessive deficit procedure. Special Report Nr. 10/2016.

European Stability Mechanism (ESM) – Independent Evaluator. EFSF/ESM Financial Assistance – Evaluation Report. Luxembourg 2017.

European Stability Mechanism (ESM). Safeguarding the euro in times of crisis – The inside story of the ESM. Luxembourg 2019.

Banerji, A., E. Dabla-Norris, R. Duval, and D. Furceri (2017), The Case for Fiscal Policy to Support Structural Reforms, IMF Blog https://blogs.imf.org/2017/03/13/the-case-for-fiscal-policy-to-support-structural-reforms/

International Monetary Fund (2010), Fiscal monitor - Fiscal exit: from strategy to implementation. November 2010.

Independent Evaluation Office (2016), EVALUATION REPORT. The IMF and the Crises in Greece, Ireland, and Portugal, Washington.

OECD (2018), Economic Survey of Greece, April 2018.

APPENDIX 2: METHODOLOGY

The methodology to assess the macroeconomic and fiscal adjustment path in Greece during the three programmes relies on the principles of the policy evaluation approach and aims at answering the five questions indicated in the request for services (RfS).

It consists of identifying the intervention logic of each of the three programmes, focusing on fiscal and labour market policies, and defining an assessment framework where the elements of the intervention logic and the policy evaluation help respond to the five questions under study in a structured and evidence-based fashion.

This analytical approach aims to identify the main features of the Greek adjustment programmes in order to clarify the logic followed by EU decision makers, more specifically the European Commission, when establishing such programmes with particular reference to the Greek macroeconomic adjustment.

The assessment aimed to balance a full understanding of the intervention with a retrospective judgement. At the time, many decisions were taken with uncertainty and imminent financial stability concerns, as well as a considerable number of political, economic, social or legal constraints, within the framework of the Troika programmes. The evaluation thus attempted to determine not only whether the decisions taken on the different programmes were plausible given the available information at the time, but also which are to lessons to be learned to date.

Any judgements made in the context of this study fell into two categories.

The first one is *evidence-based*, with assessments being drawn on the scientific literature and evidence available. Public data used, included the Eurostat and Ameco, and related ECB, ESM and IMF sources, as well as information from the intervening academic literature, other international organisations, the private sector and academic research. As the present study took place about four years after the launch of Greece last bailout programme (2015), with some of the objectives for debt reduction still being in place, empirically, the analysis mostly focused on the observable short-term effects rather than on the medium to long-term ones, particularly as the latter cannot be fully quantified.

The second category is *model-based*. An assessment of the adjustment path for Greece tried to quantitatively measure the action taken in conjunction with the feasible alternatives. Thus, an essential part of this evaluation was focused on counterfactual scenarios based on the National Institute's Global

Econometric Model (NiGEM). The use of a structural macro model seems appropriate in the context of an *ex-post* assessment of such an articulated program given the extraordinary nature of the events unfolding from the 2010 sovereign debt crisis up until recently. While it will not always be easy to take into consideration the impact of the political context and other unobservable or exogenous factors, the exercise allowed nonetheless for a much broader range of aspects to be taken into account, which can produce results that are more relevant in terms of *ex-post* evaluation.

The approach taken used indeed a conventional macroeconomic framework and cross-country comparisons to assess the effects of the various policy choices made during the period 2010-2018 and whether these achieved the objectives that were set. We did evaluate the impact of other possible policy adjustment paths through these counterfactual exercises, particularly as the study considered information and risks at the time decisions were taken, as well as lessons learned with the benefit of hindsight.

A vital part of the assessment was to consider the analytical approach behind the chosen policy adjustment paths and their evidence base. Where relevant, we highlighted critical structural differences between Greece and the other programme countries, comparing the experience of Greece to that of other countries that went through similar (albeit not comparable in size) adjustment programmes (see also Alcidi and Capolongo, 2020).

As a result, the study was divided into two desk-based workstreams which employed the use of NiGEM and some empirical estimates. In addition to desk-based analysis, we engaged with key stakeholders with experience of the Greece adjustment programmes and their effects. This included officials from the ECB, IMF, European Commission, as well as other private sector representatives and academics with first-hand experience with respect to the Greek adjustment programs.

Scoping interviews with selected stakeholders in the early stage of the study helped to ensure the right focus of the work and to consider additional factors to better understand the rationale for certain choices and their outcome. The list of interviewees together with guideline interview questions are reported in Appendix 4. Interviews have been anonymised and their main messages are summarised in what follows. The key insights have been integrated in the analysis, where necessary, to gain a multi-dimensional mapping of economic and financial aspects related to the programmes.

A stakeholder workshop took place on 12 May 2020, in partnership with CEPS. Given the current COVID-19 related circumstances, the workshop took place online. The event acted as a validation exercise to the current study, by mean of quantitative questions asked to the stakeholders involved in the adjustment programmes. Invitees received a summary of the main findings of the analysis in advance, and the workshop gave them the opportunity to learn about the preliminary findings of the study and the occasion to provide feedback on the different aspects of the analysis and NIESR's preparation of the overall assessment. The below reports the outputs of the workshop in terms of participants' views on specific matters and a summary of the main comments on the work presented.

In order to gauge more specific insights on the validity of our results, during an online stakeholder workshop organized on May 12, 2020, including some of the intervening institutions previously interviewed, we asked the participants to answer a set of questions strictly related to the findings of this report. The representatives of the different institutions were asked the extent to which they would agree with a set of statements. These results are summarized in Table 4.

The remainder of this Annex provides an overview of the approach to build the analytical framework and methodological approach to answer each of the questions in the RfS.

Evaluation framework

The consultation provides answers to the following questions posed in the RfS. In doing so, the study identified the intervention logic of each programme and the objective of the study to deliver a sound evidence base in line with the macroeconomic conditions prevalent at each time (see Section 5.1).

- *To what extent was the design and outcome of the macroeconomic trajectory in the programmes appropriate to restore market access and to achieve the required adjustment of the economy? To what extent was the time horizon appropriate to achieve the objectives?*

- *Could there have been a different programme strategy to achieve the objectives at lower economic and social costs? To what extent were the focus, timing and flexibility of conditionality appropriate? To what extent was the implementation of the programme efficient? How proportionate were the costs and benefits of the intervention borne by different stakeholder groups? Was the programme's exit strategy appropriate?*

- *To what extent were labour market and wage policies successful in terms of restoring price and cost competitiveness?*

- *How did prices respond to the wage adjustment? Have changes in relative wages and prices been supportive of the sought-after economic reallocation towards more profitable sectors?*

- *In the design of the different measures, have the potential economic and social implications been identified and taken into account considering the conditions of economic and financial stress?*

These results fed into the overall study of the Greek bail-out programs. The contributions helped answer the questions below according to the five criteria, namely:

Effectiveness: Our analysis of the design and outcome of the programmes helped identify how the objectives of the Greek economic adjustment programme were achieved and whether the results and impacts have fully materialised.

Relevance: Whether the objectives and conditionality of the economic adjustment programmes were relevant to the economic and financial challenges faced by Greece.

*Efficiency***:** We discussed the extent the programmes' design and implementation were appropriate given the intended outputs and results. One of the critical issues is how efficient the programmes were calibrated and whether the objectives could have been achieved with less net costs to the Greek economy.

EU added value: We aimed at complementing the stakeholder consultation by providing a model-based estimate of other counter-factual policy options.

Coherence: We asked whether the EU intervention was consistent with its stated objectives and relevant EU policies. We investigated this issue through stakeholders consultation, as well as different sequencing of policy choices through NiGEM.

Strengths and limitations

The approach of the study has been designed to ensure a sound and balanced assessment.

The preparation of the study has benefited from the oversight of the ISG and in particular of DG-ECFIN. Stakeholders and experts/academics—who took part in the Greek adjustment programmes directly or have deep knowledge of the

facts—were involved in the process of preparation of the study. They were given the opportunity to express their views and their reading of the facts as well as to provide feedback to the study at different stages and take part in the process of validation of the analysis and of the provisional findings.

The study encountered a few important limitations.

First, to address both internal and international economic changes, which are expected to be substantial in countries that have applied for external support, economic adjustment plans might not always be implemented as intended. This suggests that there could be a feedback loop between design and implementation, and it thus might be difficult in this context to differentiate between the initial conception of the programme and its application. In our simulation analysis, the study focuses on the initial design of the programme as intended through the MoU. We also consider how conditionality practically evolved, however, and the achieved reforms and fiscal policy results, through the empirical applications. Also, thanks to relevant stakeholders' involvement and consultations, we discuss, where possible, each original programme and its enactment in practice.

Secondly, the results may be biased by uncertainty and structural changes occurring in countries experiencing financial crises. In this respect standard linear-mode fall short of exactly quantifying the extent of the change, as they work under the assumption that the parameters used to calibrate the model – hence, the fundamental relations in the economy – have not substantially changed. This might limit the extent of the conceptual exercise, particularly considering that much of the urge to restructuring was first market-driven, as the result of run and speculation; all of which cannot be endogenized in our model.

Third, one of the key differences between the Greek adjustment programme and a standard IMF bailout programme is that Greece is in a currency union, the euro area. Regarding the 2010 sovereign debt crisis in Europe, the 2016 report from the Independent Evaluation Office (IEO), the IMF's own independent watchdog, said the IMF was guilty of "over-optimistic forecasts failed to spot the scale of the problem and left the impression […] [of] treating Europe differently." It should be specified that the IMF's Articles of Agreement contain no provision for joint membership to a currency union, creating complexities absent in its relationship with non-currency-union members in terms of surveillance and conditional lending. Hence, a third limitation consists in the fact that complementarities and governance structure in place made the

adjustment program in the southern euro area periphery, and Greece in particular, more complicated than in other IMF-programme countries; complementarities which often can be hardly measured and quantified. Particularly, when it comes to our Scenario number 3, entailing a simulation of stretching out the fiscal adjustment over time contains some caveats. In particular, the external constraints to each programme were clearly different, as explained in the text, and it was not clear *a priori* a longer-term adjustment program could be implemented given these constraints. In addition, the analysis presented here first focuses on the fiscal consolidation programmes and asks whether there could have been alternative trade-offs between restoring budget balance and pushing the economy into a recession. This question was mainly answered by building on counterfactual scenarios based on the National Institute Global Econometric Model (NiGEM), where the composition of fiscal consolidation between tax increases and spending cuts was altered. While the situation – including the prevailing constraints – was more complex in reality, a stylized approach which we have employed through our econometric model (NiGEM) naturally requires assumptions and quantifiable trade-offs.

Fourth, the spectrum of workshop participants was limited. Albeit the participants involved at the different stages of this study are some among the key stakeholders with first-hand experience of the Greek programs, it should be acknowledged that the numbers are somewhat small to be a representative sample. In this sense, the outcome of the stakeholder consultations could be biased in favour of Greece as a beneficiary, while lacking the perspective of other stakeholders such as the creditors of the financial assistance.

Finally, insufficient passage of time after the third programme to measure impacts, with some of the effects of the implemented reforms not having yet fully materialised, means that only the short to medium term cost and benefit could be quantified.

APPENDIX 3: OUTCOME OF STAKEHOLDER CONSULTATIONS

Overview of the scoping interviews

In the initial stage of the project we conducted several interviews with key experts who took part directly in the Greek adjustment programme, experts who followed the events as well as policymakers of that time. Annex 4 contains the scoping interview guideline. Table 5 provides an overview of the answers to the key questions.

Table 5: Results of the stakeholders' interviews

	Questions	Summary of answers
Macro Trajectory	*1. To what extent was the design and outcome of the macroeconomic trajectory in the programmes appropriate to achieve the required adjustment of the economy?*	The general impression if that a lot emphasis was put on the first programme with the idea of front loading the effort to re-gain credibility. The weak political support for it, however, was not something that was thoroughly considered, and this made the adjustment more difficult. Sometimes it resulted in a balancing act of the Greek government between achieving the desired adjustment, initially through cuts in the public sector, and retaining political support. The size of the first programme was substantial and this "managed to reverse the existing imbalances". Yet, some political economy aspects were • In reality, financial assistance came at a cost and there are budget constraints, which could be ignored from an economic, as well political economy-viewpoint. Such constraints resulted in a consolidation which stretched "over too long-time", resulting in "political fatigue".

Fiscal targets	*2. Were the fiscal targets set appropriately?*	- The very nature of the three-year adjustment programme, "by construction require[d] strong front loading of fiscal efforts". Had a programme been agreed over a longer-period, the path towards the adjustment would have been arguably slower and somewhat, milder. - The way the fiscal targets were set had to achieve a balance between what was feasible politically and what represented a 'first-best' economically. - In this sense, "fiscal targets were way too ambitious" and the necessary structural reforms were lagging. Some have argued they should have been anticipated. - Somehow, some of the stakeholders retained the opinion that the speed of the adjustment was "too fast" while the financing envelope was insufficient, with no further support for additional financing needs..

Quality of Adjustment	3. Was sufficient attention given to the quality of the adjustment?	• Here, the overall opinion is that not much attention was given to the quality of the adjustment. Several institutional aspects were left unattended such as "higher education, the effectiveness of the judiciary, arbitration process, etc."
		• Such attention to the quality of the adjustment improved over time, however. In this respect, one example is heath expenditure. At the beginning the focus seemed to be on horizontal cuts mainly; later on more focus was given to the expenditure composition as well as the governance aspects. The quality of the adjustment on labour markets, pension reforms, as well as labour markets' reforms (unemployment benefits and assistance) was assessed to be "in the right direction, as the reforms focused on extending the eligibility criteria". Equally, employment protection legislation and minimum wages aimed at making labour markets more flexible. Such an approach towards increased flexibility did not, however, safeguarded small family businesses and self-employed who ended up with lower levels of security.
		• For the quality pf the adjustment outside labour markets, there was less attention to quality as "liquidity constraints were binding".

| Labour and wage policies | 4. To what extent were labour market and wage policies successful? | • In the private sector, internal devaluation schemes were deemed too "harsh". The plan failed to properly distinguish between the public and the private sector. Formerly, workers had many opportunities to minimise or even neutralise salary cuts. Thus the main burden of the adjustment fellonto the private sector.
• The social effect of the labour market reforms largely benefited from the Mediterranean social and welfare model where "pensioners were, to a large extent, providing social support in the family".
• The sense is that some reforms, such as labour and product market reforms, were implemented to to prompt a quicker adjustment – the focus was on reforms which would have met the least political and social resistance. |

| Social and Economic impact | 5. In the design of the programmes have the potential economic and social implications been identified and taken into account? | • There is a general sense that in the design of the programmes the potential economic and social implications haven't been identified and taken into account. In fact, while the economic constraints were clear, the political ones were not. The execution of the programme byof the Greek authorities was really problematic; one example being with pensions with many civil servants deciding to retire early.
• It was complicated for external authorities to identify such social costs and most stakeholders' view is that the government should have been more promt in identifying these social dimensions. For instance, a policy mix to protect pensioners and tax payers was adopted at the expenses of system ability to deliver basic public service such as the health sector. |

Overview of the stakeholder validation workshop

Beyond direct interviews, we engaged in a stakeholders' consultation using targeted interviews and a panel discussion. The purpose of a stakeholder consultation workshop was to promote a transparent and thorough understanding of the deeper issues and to obtain detailed insights into the key assessment areas.

The stakeholder workshop involved a total of 21 participants. In addition to the NIESR team, representative from the CEPS team, and the members of the ISG, 13 senior officials from the main institutions involved in the Greek programmes (European Commission, IMF, ESM) and independent academics participated in the discussion. The comments focused on the main findings of the evaluation which were presented by the NIESR team. Given the online format and the limited time available, polls with multiple choice questions were used to gather participants' views and kick-start the discussion. The results of the polls are shown in the bar charts below. Comments, feedback, and additional sources of information from the experts were used to amend and/or integrate the analysis and hence in the formulation of the final assessment of the study.

A summary of these findings is presented below. They are based on outcomes of the polls conducted during the workshop and on the oral feedback

The consultation was mainly centred on balanced growth, financial stability and the fiscal sustainability implications for the theoretical exercise/simulation, as well as the labour, competitiveness and macroeconomic adjustment channels, for our empirical analysis. Through stakeholder involvement, we engaged in an assessment of the institutional arrangements of the Greek programme implementation, aimed at consolidating the above results. The purpose overall was that of answering the questions oriented at the study criteria of the Commission's Better Regulation framework, notably effectiveness, efficiency, coherence, relevance and EU added value of the programme – See Annex 3.

A set of high-end stakeholders have been identified among the IMF, ECB, ECFIN, the EBRD, the LSE Hellenic Observatory, University of Athens and former Greek authorities.

The results of the stakeholder consultation in Figure 38 provides qualitative support for some of the themes we develop in this report.

First, the majority of stakeholders agreed that the adjustment was too severe and that the impact on economic growth was either ignored or minimized. The objective of a structural fiscal surplus of 3.5 per cent of GDP was overly

optimistic given the weakness of the economy and the large budget deficit of 10 per cent of GDP at the beginning of the programmes. Nearly all stakeholders agreed that the financing side of the programme was insufficient and that it led to a widespread lack of confidence by households, businesses and financial markets that the programme would be successful.

Secondly, the sequencing of reforms was not agreed on at the beginning of the programmes and was left to the Greek government. Several stakeholders explained that the political considerations led to prioritizing reforms with the least social or political resistance, rather than reforms with the highest expected gains. While this might not be problematic in terms of evaluating the effect of the reforms *ex-post* based on the data, it makes it at times difficult to draw stylized hypothesis about the programme's quantitative objectives.

Consistent with our findings, the stakeholders' engagement exercise reveals that there is a general disagreement that the timing, quality, duration and balance of the objectives of the adjustments (considering the overall adjustment across the three programmes) were fully appropriate. This includes the extent to which the social impacts of the reforms were appropriately taken into account. In other words, the stakeholders strongly voiced their concerns that fiscal targets and instruments were inappropriate, with some of the experts dubbing the approach as excessively *shortermist* with no thought-through exit strategy, which has naturally generated the occurrence of more than one programme.

On the whole, however, there was a general agreement that the fiscal targets were achieved, and the labour market reforms were successful in promoting wage reductions and adjustments, thus spurring (sectoral) competitiveness. According to the stakeholders, despite the labour and product market reforms, manufacturing production and exports did not improve, mainly as the result of the small size of the traded sector. This is in line with our predictions.

Consistent with our previous results, there was no clarity across stakeholders on the expected effect of the reforms in terms of the allocation to the more efficient sectors, nor was the effect on firms' competitiveness – as the result of Greece deregulation effort – clear across the participants.

Finally, in line with our predictions, many saw the lack of a shield for public investment as a short-term solution, which did not give enough attention to structural/long term issues; with the main issue here being identified as political. According to many, the successive governments were unable to win political support for the different programmes internally, and some stakeholders

would agree that *politics* was mainly to blame for the unnecessary costs of the individual programmes in the first place, which made the Greek adjustment – already within the constraint of the fixed exchange rate and currency union – even more costly.
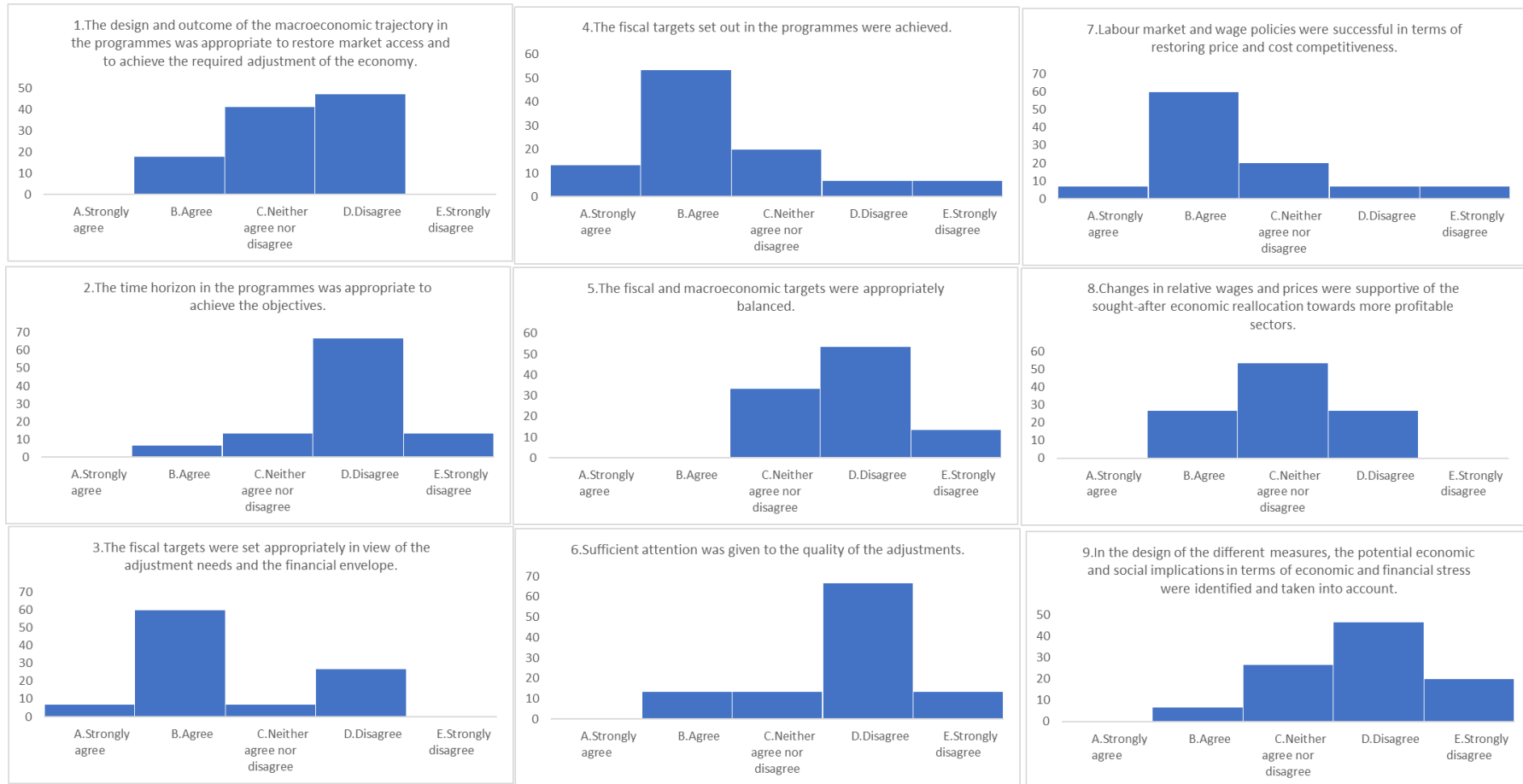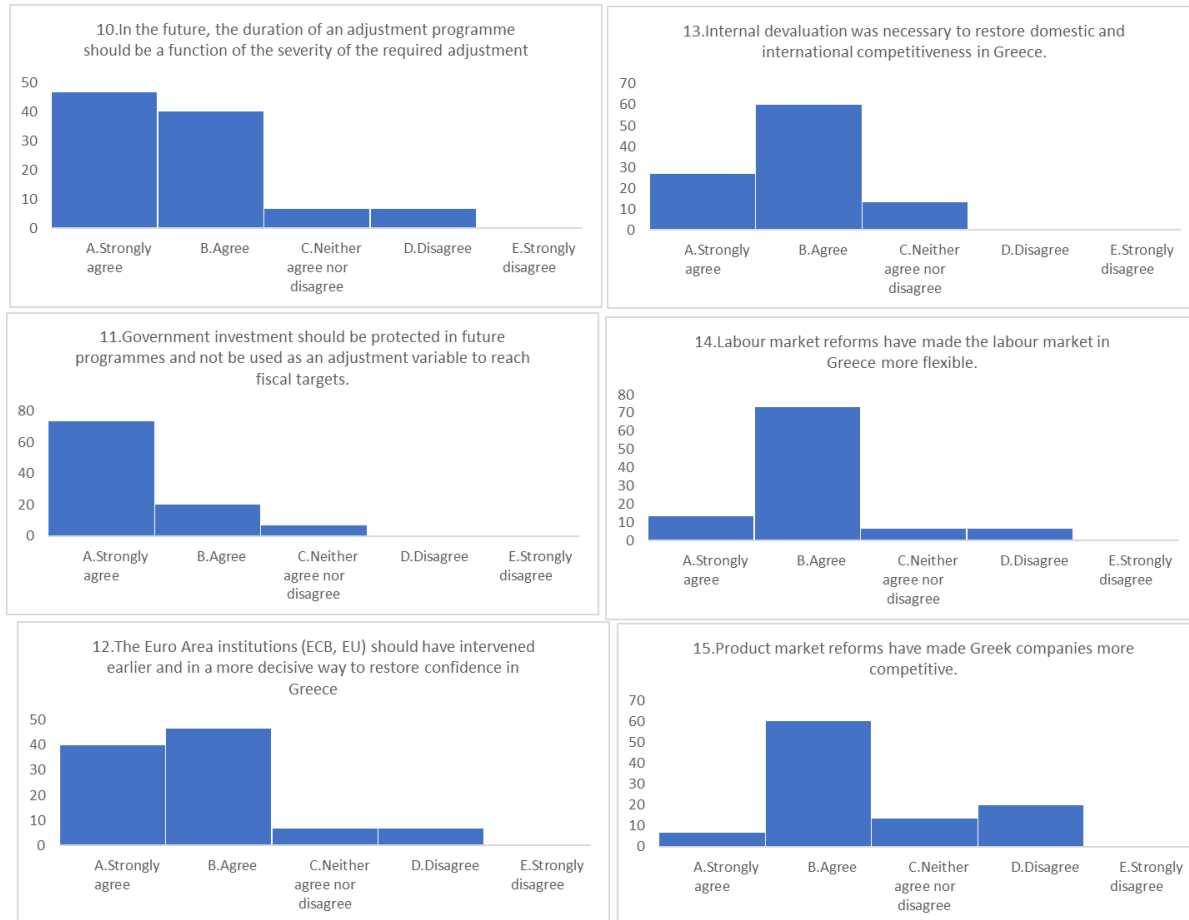
Figure 35. Stakeholder evaluation

Directorate-General for Economic and Financial Affairs

EUR EN

Figure 35 (continued)

10.In the future, the duration of an adjustment programme should be a function of the severity of the required adjustment

11.Government investment should be protected in future programmes and not be used as an adjustment variable to reach fiscal targets.

12.The Euro Area institutions (ECB, EU) should have intervened earlier and in a more decisive way to restore confidence in Greece

13.Internal devaluation was necessary to restore domestic and international competitiveness in Greece.

14.Labour market reforms have made the labour market in Greece more flexible.

15.Product market reforms have made Greek companies more competitive.

APPENDIX 4: STAKEHOLDER QUESTIONNAIRE

Guideline for interviews

Background

CEPS and NIESR have been commissioned by the European Commission (Directorate-General for Economic and Financial Affairs) to conduct two studies on the Greek adjustment Programmes, 2010-2018.

One study on *Sovereign debt sustainability in Greece during the economic adjustment programmes* and one study on *The macroeconomic and fiscal path in Greece during the economic adjustment programmes*. The studies will serve as background for the overall evaluation of the economic adjustment programme for Greece for the period 2010-2018.

In the context of the two Studies, CEPS and NIESR are collecting the views of different stakeholders and experts which have participated in the programmes, at different stage and and/or have experience directly the programmes. Such views, combined with hard evidence will contribute to form the judgment and the overall evaluation of the Programmes

Instructions

This interview aims to gather the views of selected stakeholders on whether non-financial information disclosed by companies is material and useful. The interviews are conducted by CEPS and NIESR on behalf of the European Commission, Directorate general for Economic and Financial Affairs.

If you wish to receive further information regarding this study, please feel free to contact the project coordinators:

> Cinzia Alcidi
> Head of Economic Policy Unit, CEPS
> Phone: +32.(0)2.229.39.58
> Email: cinzia.alcidi@ceps.eu
>
> Garry Young
> Head of Macroeconomic Modelling, NIESR
> Email: G.Young@niesr.ac.uk

Thank you for your valuable input.

Personal data protection

Data and information provided during this interview will not be disclosed to any third party. Interviews will be anonymized.

Raw data and information may be shared with DG ECFIN of the European Commission. Results will be published so as not to be attributable to any specific respondent, unless otherwise agreed upon with the interviewee in written form.

REGISTRATION

REG.01 Please indicate your **name and surname** and position in your organisation:

REG.02 Please indicate the name of the **organisation** you are part of:

Athens University of Economics & Business

REG.03 Please indicate your **email address**:

DEBT SUSTAINABILITY

DSA

1. To what extent was the **approach for assessing debt sustainability** in the programmes **appropriate**?

2. Are you aware of the DSA **methodology** used? What are the key assumptions? What the key shortcomings?

3. Do you think the trade-off between the debt reduction needs and the ambition of the primary surplus was well assessed?

4. How important was the time horizon?

Debt restructuring and PSI

5. To what extent was the **approach to debt restructuring appropriate**?

6. Was the timing right?

7. Were expectations correct?

8. Were the actual measures and modalities compatible with expectations?

9. Was the restructuring properly linked to the policy conditionality?

10. What was the impact of the PSI on the domestic economy?

11. What was the impact of the PSI on the domestic financial sector?

12. Did the programme account for these effects?

13. What are in your opinion the essential aspects of the financial sector that are needed to assess debt sustainability?

14. What are the most important political economy elements that we need to include in the assessment of debt sustainability?

Reforms

15. Do you think that the reform implementation / or lack reform implementation had an impact on debt sustainability?

    a. Can you give an example?

16. Do you think the (write or wrong) sequencing of the reforms played a role in affecting debt developments?

    a. Can you give an example?

    b. How should have been different?

Market access

17. Did the programmes help Greece to regain sustainable market access?

    a. How?

18. Do you have in mind a particular counterfactual exercise that could be conducted in order to better assess the links between the programmes and debt sustainability?

Macro and fiscal path

1. To what extent was the design and outcome of the macroeconomic trajectory in the programmes appropriate to achieve the required adjustment of the economy?

    a. To what extent was the time horizon appropriate to achieve the objectives?

2. Were the fiscal targets set appropriately?

3. Was sufficient attention given to the quality of the adjustment?

4. To what extent were labour market and wage policies successful?

5. In the design of the programmes have the potential economic and social implications been identified and taken into account?

FINAL VALIDATION QUESTIONS

To what extent do you agree with the following sentences. Possible responses are (Strongly agree, Agree, Neither agree nor disagree, disagree, Strongly disagree)

1. The design and outcome of the macroeconomic trajectory in the programmes was appropriate to restore market access and to achieve the required adjustment of the economy.

2. The time horizon in the programmes was appropriate to achieve the objectives.

3. The fiscal targets were set appropriately in view of the adjustment needs and the financial envelope.

4. The fiscal targets set out in the programmes were achieved.

5. The fiscal and macroeconomic targets were appropriately balanced.

6. Sufficient attention was given to the quality of the adjustments.

7. Labour market and wage policies were successful in terms of restoring price and cost competitiveness.

8. Changes in relative wages and prices were supportive of the sought-after economic reallocation towards more profitable sectors.

9. In the design of the different measures, the potential economic and social implications in terms of economic and financial stress were identified and taken into account.

10. In the future, the duration of an adjustment programme should be a function of the severity of the required adjustment

11. Government investment should be protected in future programmes and not be used as an adjustment variable to reach fiscal targets

12. The euro Area institutions (ECB, EU) should have intervened earlier and in a more decisive way to restore confidence in Greece

13. Internal devaluation was necessary to restore domestic and international competitiveness in Greece

14. Labour market reforms have made the labour market in Greece more flexible

15. Product market reforms have made Greek companies more competitive