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Directorate-General for Economic and Financial Affairs

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Marco Buti
Director-General

In his State of the Union address in September, Commission President Jean-Claude Juncker stressed that the European Union (EU) ‘is, at least in part, in an existential crisis’. He urged leaders to pull together to stop the EU unravelling in a challenging environment of low trust, rising populism and greater focus on domestic problems in several Member States.

One important reason for the worrisome situation is the sluggish recovery from the Great Recession. While growth has proven resilient in recent quarters and GDP in the euro area is now higher than before the crisis, the recovery has remained slow compared to past recoveries and inflation remains persistently low. Also, the rising current account surplus reflects a weaker dynamics of internal demand relative to output. Substantial slack persists in the economy, in particular in the labour market, with the unemployment rate still in double digits and a low number of total hours worked.

The modest recovery has been strongly dependant on external demand and monetary policy. The ECB has brought policy rates to the zero lower bound and launched a series of unconventional policy measures, which have resulted in an increase in its balance sheet. While this has helped sustain the recovery, there is now a consensus that it would be a mistake to rely on monetary policy alone.

How can other policies help overcome this situation?

First, it is crucial to foster the economic resilience of euro area Member States (see Section 1 of this report). This means increasing the capacity of an economy to (i) strengthen productivity and minimise risks, and (ii) withstand a shock and, if a shock does hit, to swiftly adjust to it in terms of closing the output gap.

The erstwhile belief that the creation of a common currency would be a sufficient catalyst for reforms has turned out to be too optimistic. During the first 10 years of the EMU, capital flows from the centre to the periphery of the euro area coincided with accelerated growth rates in the periphery. But they increasingly supported investment in non-tradable activities, in the presence of inflation differentials and competitiveness losses in the periphery. The higher but unsustainable growth in the euro area periphery contributed to a situation of reform anaesthesia.

More generally, credible reforms face sizeable obstacles in the political arena, despite their long-term benefits. Since reforms do not exclusively produce winners, potential losers, in absence of compensation schemes, have incentives to resist. Moreover, uncertainty about the costs of reform can lead to a war of attrition and standstill. As a result, reform policies need to take all these obstacles into account to be successful. Ensuring that structural reforms are inclusive is particularly important.

Second, it is important to rebalance the macroeconomic policy mix (see Section 2 of this report). At present, monetary policy is almost alone in supporting aggregate demand. There is scope within the EU’s fiscal rules for responsible, growth-friendly fiscal policy to play a bigger role in supporting demand in the euro area today. This should be combined with measures to address the remaining weaknesses in the banking sector. Promoting an increase in demand appears particularly important given the risk that low investment or high unemployment could eventually become structural with long-lasting detrimental effects on potential growth, i.e. they could lead to hysteresis. It is indeed in the light of the slow recovery and risks in the macroeconomic environment that the European Commission (in its November 2016 Communication ‘Towards a

positive fiscal stance for the euro area²) has called for a moderately expansionary fiscal stance for the euro area at this point in time. In the current low interest rate environment, when fiscal multipliers are particularly large, there are compelling reasons to both use any available fiscal space, in Member States where this exists, and improve the composition of fiscal policy, notably by shifting public resources to material and immaterial investment.

At the same time, we cannot ignore the long-term importance of achieving and maintaining sustainable public finances. Several Member States have already accumulated very high levels of public debt and face higher ageing-related liabilities in the future. Given the expected rise in long-term interest rates linked to the fiscal

stimulus anticipated in the US, it is also essential that these countries continue to respect the EU's fiscal rules.

Summing up, the recovery has relied too heavily on the stimulus from monetary policy. It needs to be accompanied by credible structural reforms and growth-supportive fiscal policies. This is a view shared by the global community. At its September meetings, the G20 reiterated its commitment to a three-pronged growth strategy, stating their determination to 'use all policy tools –monetary, fiscal and structural — individually and collectively to achieve our goal of strong, sustainable, balanced and inclusive growth'. Such an improved policy mix would ease the smooth functioning of the EMU and prevent an increase in global imbalances.

I. How to make the Economic and Monetary Union more resilient?

In the absence of nominal exchange rate policies, euro area Member States need to absorb economic shocks via internal adjustment processes. The assumption that the launch of the euro would initiate a structural convergence process increasing economic resilience across euro area countries turned out to be too optimistic. Instead, differences in economic structures contributed to the length and depth of the last crisis and still pose a significant risk to the proper functioning of the Economic and Monetary Union (EMU). There is a broad consensus about the need to enhance convergence in economic resilience in the euro area Member States.

This Section explains that economic resilience can be strengthened by lowering a country's vulnerability/exposure to economic shocks (likelihood of shock occurrence) and/or by fostering its capacity to adjust to shocks that may occur, namely by reducing their persistence and minimising their amplitude. In product markets, adjustment capacity can be improved by policies fostering the reallocation of productive resources, such as deregulation or reducing the cost of starting or closing a business. Flexible labour market policies, in tandem with social protection for individuals, can facilitate the adjustment capacity of the labour market while at the same time providing workers with better labour market attachment, financial security and skills support. A promising way to strengthen resilience in the area of taxation would be to remove tax distortions that encourage excessive corporate and household leverage. These measures would help to foster inclusive growth. Finally, it remains vital for the resilience of the euro area to prevent and correct macroeconomic imbalances before they get out of hand. ⁽¹⁾

I.1. Introduction

While economic differences are to some extent inevitable in a monetary union, large and persistent differences are a serious concern for several reasons. They can: (i) make the single monetary policy less effective, in particular if monetary policy is constrained by the zero lower bound; (ii) turn into lasting differences in structural growth; (iii) spill over to other countries; and/or (iv) undermine citizens' trust in the EMU.

It therefore comes as no surprise that the necessary degree of economic convergence among members of the EMU has been discussed intensely in both the academic and political arena. The theory of optimum currency areas (OCA) provides a natural starting point.⁽²⁾ It identifies several criteria as determining the optimality of a currency union, in particular wage and price flexibility, inter-regional labour mobility, economic openness, and both fiscal and financial integration. The higher the level of integration or flexibility in those criteria, the quicker and more complete the adjustment after

being hit by (a)symmetric shocks and the more optimal the currency union. The synchronisation of business cycles between members forming a currency union has been established as a key indicator measuring the fulfilment of the OCA criteria.

The main criteria for entering the EMU, the so-called Maastricht or euro convergence criteria, were based on the concept of nominal convergence, i.e. convergence of nominal variables such as long-term interest, inflation and exchange rates, and government deficit and debt ratios.

When the euro area project was designed, a number of scholars raised the question whether the OCA criteria were sufficiently met in the participating Member States to ensure the proper functioning of the EMU.⁽³⁾ Many policymakers and scholars expected that these criteria were 'endogenous'.⁽⁴⁾ This means that the criteria,

⁽¹⁾ This section was prepared by Erik Canton, Philipp Mohl, Adriana Reut and Melanie Ward-Warmedinger.

⁽²⁾ Mundell, R. (1961), 'A theory of optimum currency areas', *American Economic Review*, 51(4), 657-665; McKinnon, R. (1963), 'Optimum currency areas', *American Economic Review*, 53(4), 717-725.

⁽³⁾ Bean, C. (1992), 'Economic and Monetary Union in Europe', *Journal of Economic Perspectives*, 6, 31-52; Feldstein, M. (1997), 'The political economy of the European Economic and Monetary Union: Political sources of an economic liability', *Journal of Economic Perspectives*, 11, 23-42.

⁽⁴⁾ Emerson, M., D. Gros and A. Italianer (1992), 'One market, one money. An evaluation of the potential benefits and costs of forming an Economic and Monetary Union', Oxford University Press: Oxford; Frankel, J. and A. Rose (1998), 'The endogeneity of the optimum currency area criteria', *Economic Journal*, 108,

although not satisfied before the euro was introduced, would be met thereafter, because EMU participation would entail increased trade integration. In a similar vein, losing the exchange rate as an adjustment instrument was expected to trigger a process of structural reform aimed at strengthening the resilience of participating Member States.⁽⁵⁾

Empirical evidence from the initial years of EMU seemed to support the ‘endogeneity hypothesis’.⁽⁶⁾ However, the Great Recession and the sluggish recovery again revealed sizeable and persistent differences among euro area Member States, the origin of which predates the onset of the crisis.⁽⁷⁾

Against this background, this article analyses how the EMU could be made more resilient. Section 2 reviews the convergence trends in the EMU. Section 3 looks at defining economic resilience. Sections 4, 5 and 6 examine how economic resilience could be strengthened in the euro area in key policy areas, namely in product and labour markets and in taxation. Section 5 presents conclusions.

I.2. Convergence trends in the EMU

Convergence trends in the EMU can be divided into at least two phases.⁽⁸⁾

From the run-up to the EMU to the Great Recession

The aim of becoming a member of the euro ‘club’ pushed Member States to fulfil the Maastricht criteria, resulting in a nominal convergence process

(see Graph I.1). In the run-up to the EMU, the differences in inflation rates between countries participating in monetary union narrowed. Similarly, differences in nominal interest rates dropped substantially, supported by converging inflation differentials, reduced exchange rate risk, the integration of financial (notably bond) markets and reduced government deficits. Despite these positive developments, differences between euro area countries’ public debt ratios have remained high.

However, and in contrast to earlier expectations, the first decade of EMU has led neither to sustainable convergence of per capita income across euro area countries nor to major synchronisation of business cycles (see Graph I.2). Instead, there is evidence for per capita income convergence only if catching-up by central and eastern European countries is included in the sample.⁽⁹⁾

This lack of per capita income convergence and synchronisation of business cycles is related to several factors.⁽¹⁰⁾ Despite the sizeable capital flowing from the ‘centre’ to the ‘periphery’ following the reduced exchange rate risk and default probabilities, investment in the periphery flowed in particular to the non-tradable sector, which resulted in unsustainable developments in the housing sector in countries like Spain and Ireland. Moreover, after the entry to the euro area, several Member States disregarded the need for structural reforms in key areas such as product and labour market policies, and despite some improvement concerning mainly product market reforms, this resulted in incomplete convergence of economic structures (see Graph I.3).⁽¹¹⁾

1009-1025; De Grauwe, P. and F. Mongelli (2005), ‘Endogeneities of optimum currency areas. What brings countries sharing a single currency closer together?’, ECB Working Paper, No 468, April.

⁽⁵⁾ Calmfors, L. (1998), ‘Macroeconomic policy, wage setting, and employment — What difference does the EMU make?’ Oxford Review of Economic Policy, 14(2), 125-151.

⁽⁶⁾ European Commission (2008), ‘EMU@10. Successes and challenges after ten years of Economic and Monetary Union’, European Economy, 2; Böwer, U. and C. Guillemineau (2006), ‘Determinants of business cycle synchronisation across euro area countries’, ECB Working Paper, No 587, February.

⁽⁷⁾ Crespo-Cuaresma, J. and O. Fernández-Amadore (2013), ‘Business cycle convergence in the EMU: A second look at the second moment’, Journal of International Money and Finance, 37, October 239-259; Ruscher E., (2015), ‘An overview of market-based adjustment in the euro area in the light of the crisis’, Quarterly Report on the Euro Area, Vol.14, No 4; Mohl P. and T. Walsh (2015), ‘Revisiting the relative price mechanism’, Quarterly Report on the Euro Area, Vol 14, No 4.

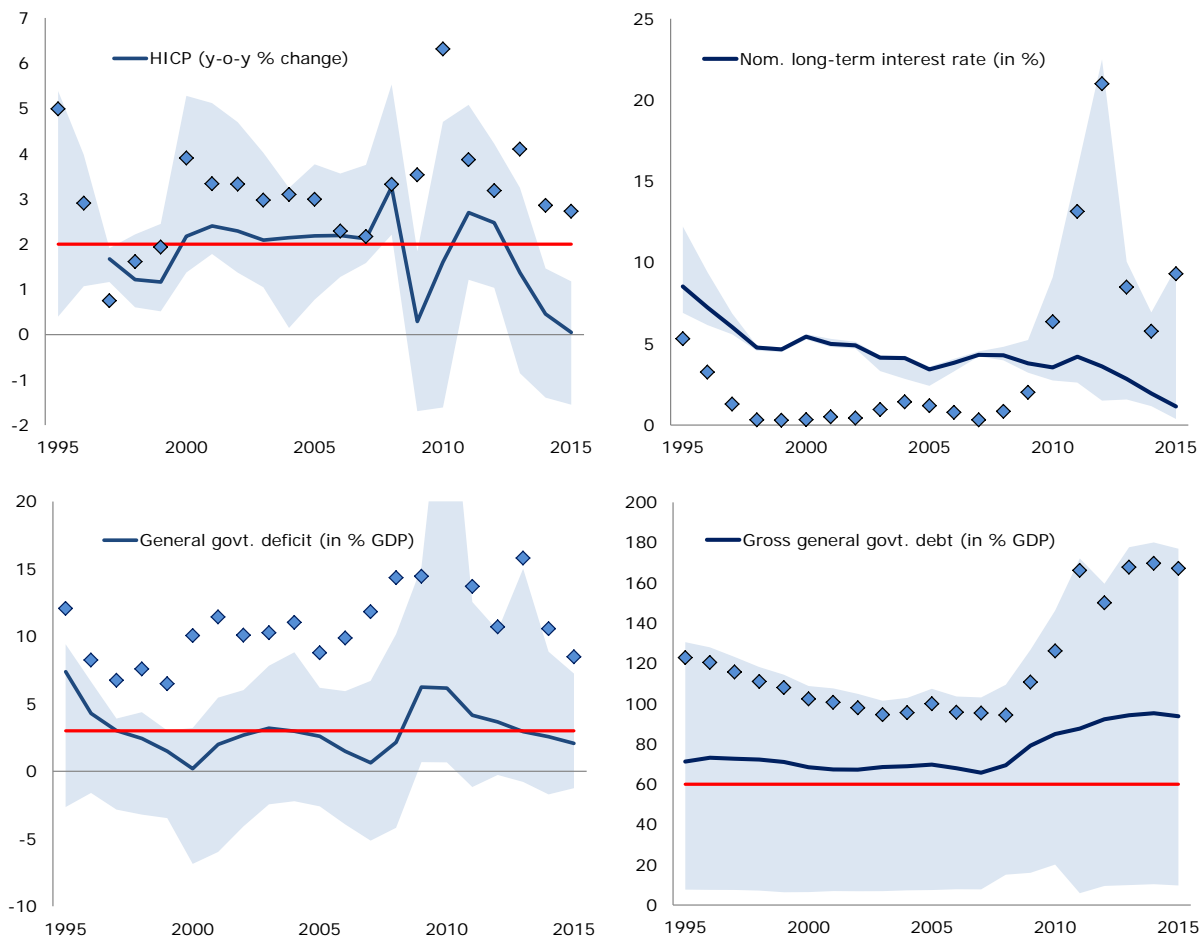
⁽⁸⁾ For a similar divide see Buti, M. and A. Turrini (2015), ‘Three waves of convergence. Can Eurozone countries start growing together again?’, VoxEU.org, 17 April 2015.

⁽⁹⁾ Some authors explain the stronger real convergence effect of eastern European countries with more positive effects from economic integration for poorer Member States (e.g. Crespo Cuaresma, J., Ritzberger-Grünwald, D. and M.A. Silgoner (2008), ‘Growth convergence and EU membership’, Applied Economics, Vol. 40, No 5, 643-656).

⁽¹⁰⁾ See, for a survey, Balta N., (2015), ‘Business cycle synchronisation in the euro area’, Quarterly Report on the Euro Area, Vol. 14, No 2; ECB (2015), ‘Real convergence in the euro area: Evidence, theory and policy implications’, ECB Economic Bulletin, Issue 5, 30-45.

⁽¹¹⁾ Regarding the economy-wide product market regulation indicator, differences across countries have become smaller over time. However, there are still substantial and persistent differences in product market regulation at sectoral level. For example, the product market regulation indicator for professional services ranges from 3.47 for Luxembourg to 0.55 in Sweden; Finland is the best performing EMU country with a sectoral PMR for professional services of 0.62 (data pertain to 2013).

Graph I.1: **Nominal convergence in the EMU (1)**
(1995-2015)



(1) Blue shaded areas indicate the distribution of the observed indicators (from maximum to minimum) across euro area Member States. Euro area defined as EA-11 (as of 1995), EA-12 (2001), EA-13 (2007), EA-15 (2008), EA-16 (2009), EA-17 (2011), EA-18 (2014), EA-19 (2015). The dark blue lines display EA-12 average values. Blue diamonds show the differences between the maximum and the minimum value, which give an indication of dispersion. For lack of space, the highest government deficit in 2011 (32.3 %) and the max-min for the same year (31.6) are not shown. The red lines show the ECB price-stability target and the reference values of the Stability and Growth Pact (SGP).

Source: European Commission forecast April 2016, DG ECFIN calculations.

Post-‘Great Recession’

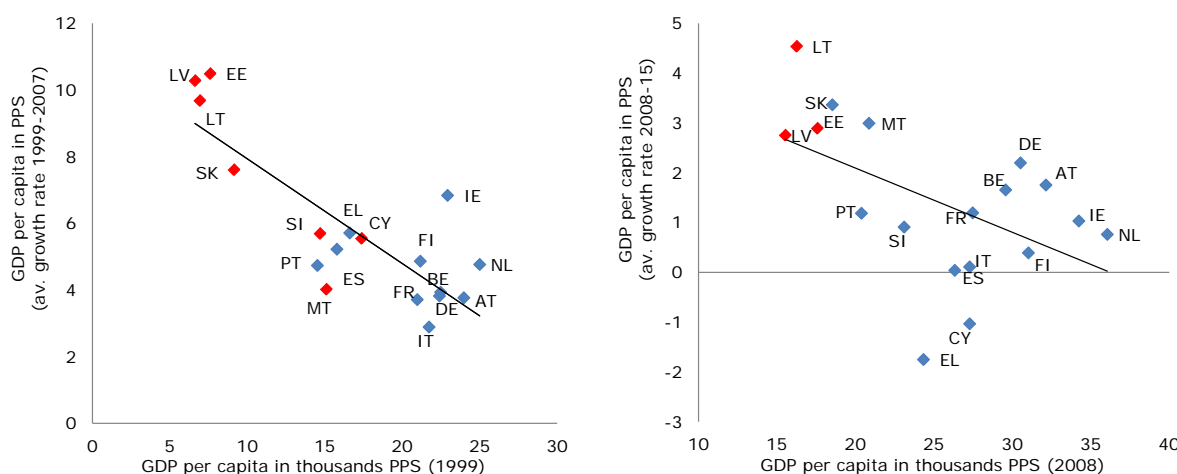
The financial crisis acted as a detonator for the imbalances accumulated during the first decade of the EMU. The massive shock that originated in the US housing sector infected the global economy in 2008. As a consequence, the euro area lived through the deepest recession since World War II.

The initial years after the crisis led to sizeable nominal divergence. Capital started flowing from the periphery to the ‘safe haven’ of the centre, supporting strong divergence in interest rates. Sizeable divergence in public deficit and debt ratios emerged following large fiscal stimuli or reflecting a collapse in revenues in some euro area Member States.

Interestingly, as predicted by the OCA analysis, most of the countries with more rigid economic structures (as measured by widely used product and labour market indicators) experienced a particularly strong downturn during the crisis and sluggish adjustment.⁽¹²⁾ A number of Member States implemented structural reforms strengthening economic resilience in the post-crisis period to overcome the most severe rigidities. However, despite the broadly supported evidence of the positive economic impact of structural reforms, progress in implementing credible reforms remains overall quite slow in many Member States’ and

⁽¹²⁾ Mohl P. and T. Walsh (2015), ‘Revisiting the relative price mechanism’, Quarterly Report on the Euro Area, Vol. 14, No 4.

Graph I.2: Per capita income convergence in the EMU (1)



(1) Countries which were not members of the euro area in 1999 (left chart) and in 2008 (right chart) are highlighted in red. Graph excludes 'outlier' data points for Luxembourg. The black regression line is based on the full sample of countries.

Source: Eurostat.

important differences in economic structures still remain.⁽¹³⁾

As a result, structural reform is unfinished business and this can be considered one important reason for the large business cycle divergences since the euro area debt crisis.⁽¹⁴⁾ There is in addition a risk of complacency and reform fatigue now that economies are recovering.⁽¹⁵⁾

I.3. Understanding economic resilience

Strengthening economic resilience is one of the two key ways to promote economic convergence (see Graph I.4 for a stylised illustration).

By addressing large and persistent cyclical differences through changes in economic structures, strengthening economic resilience has

commonly a short- to medium-term impact on the economic cycle (actual growth).

Second, economic convergence can be fostered by *increasing living standards*: This aims to address per capita income levels in Member States. It typically has a medium- to long-term impact on the economic trend (potential growth). EU regional policy has the clear objective of strengthening economic and social cohesion (Article 174 of the Treaty on the Functioning of the European Union (TFEU)).

In practice the distinction is less clear-cut, as more resilient economic structures may also contribute to higher living standards.⁽¹⁶⁾

For the purpose of ensuring the smooth functioning of the EMU, we consider convergence in resilient economic structures to be key. The economic and financial crisis demonstrated that several euro area Member States lacked appropriate economic structures to deal with the deepest economic recession since World War II. This caused sizeable negative cross-country spillover effects, questioning the viability of the euro area as a whole.

How can economic resilience be strengthened?⁽¹⁷⁾ Resilient economic structures would mean that

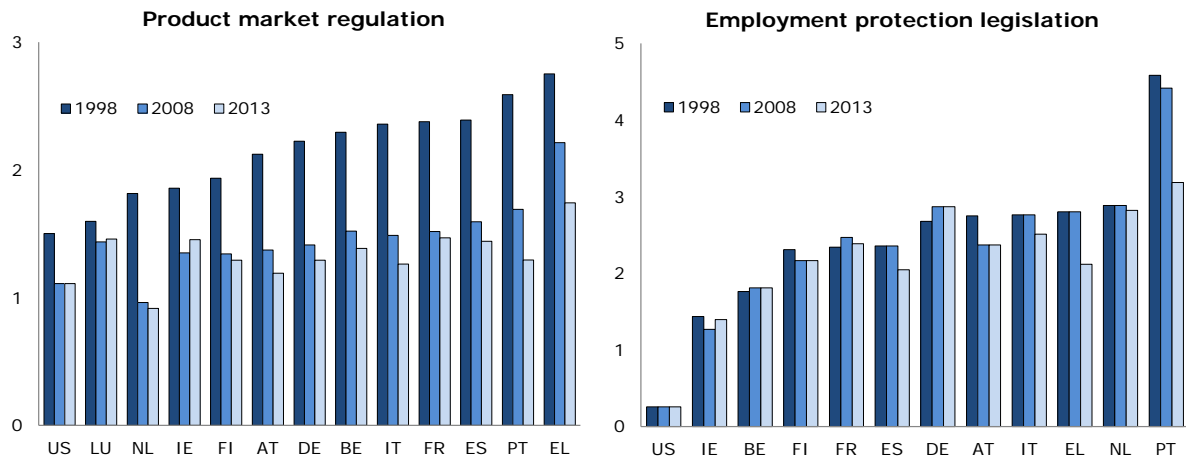
⁽¹³⁾ This could be related to political cycles, with politicians being reluctant to engage in risky and complicated reform discussions when general elections are approaching, but rent-seeking behaviour and the protection of vested interests may also block reforms. The distributional consequences of structural reforms cannot be ignored; the reality is that these reforms tend to generate per capita benefits for the general population, but at the same time may entail substantial losses for those whose privileges are reduced.

⁽¹⁴⁾ In addition, the balance sheet adjustment in both the private and public sector and the accumulation of macroeconomic imbalances have been identified as other major drivers for the large business cycle divergence since the euro area debt crisis, see Balta N., (2015), 'Business cycle synchronisation in the euro area', Quarterly Report on the Euro Area, Vol. 14, No 2.

⁽¹⁵⁾ Buti, M. and P. Padoan (2013), 'How to make Europe's incipient recovery durable: End policy uncertainty?', VOX column, 12 September.

⁽¹⁶⁾ For instance, available empirical evidence shows that policies which improve resilience (for example deregulation of labour and product markets) typically also boost innovation and innovation diffusion and thereby the economy's long-term growth prospects.

Graph I.3: Convergence in economic structures in the EMU (1)



(1) The graph shows OECD indicators measuring the degree of product and labour market regulation (the latter refers to individual and collective dismissals). Indicators range on a scale from 0 (least restrictions) to 6 (most restrictions). Latest data available 2013.

Source: DG ECFIN calculations based on OECD data.

Member States have low vulnerability to shocks and a high degree of flexibility to adjust to economic shocks (see Graph I.4). The vulnerability can largely manifest itself in terms of the likelihood of incurring a shock. The adjustment capacity is related to the magnitude and persistence of economic shocks. It also relates to mitigating the impact on those who are affected by the adjustment, and need to find a new job and/or to adjust their skills.

Reduce vulnerabilities to shocks: In the pre-crisis decade, several euro area Member States accumulated large fiscal and (internal and external) macroeconomic imbalances. This can be explained in part by a myriad of country-specific factors such as excessive demand relative to production capacity, over-optimistic growth expectations, excessive credit flows, and a lack of fiscal rigour in some Member States. These imbalances left some countries more vulnerable to shocks. In addition, euro-area-specific vulnerabilities also played a role. In particular, the EMU's institutional architecture turned out to suffer from serious design flaws, such as the lack of a financial supervision and resolution framework, a crisis resolution mechanism and a framework to monitor and correct macroeconomic imbalances. Overall, these vulnerabilities put countries in a poor starting position when hit by the shocks from the financial

crisis, being these asymmetric shocks or common shocks which turn into asymmetric (country-specific) ones. Given these starting positions, it is therefore crucial that bad policies are identified and mitigated as early as possible and that any impact of bad policies on vulnerabilities is minimised. The Macroeconomic Imbalance Procedure, launched in 2013, was designed to prevent and correct harmful macroeconomic imbalances.⁽¹⁸⁾

Foster adjustment to shocks: Member States need substantial adjustment capacity to cope with shocks for several reasons. First, shocks with asymmetric origins or effects cannot be fully eliminated in the euro area. Second, Member States can no longer use exchange rate policies to address asymmetric shocks. Finally, although recent evidence points to an effective functioning of the automatic stabilisers in the euro area,⁽¹⁹⁾ the role of national fiscal policy is often constrained by high deficits and debt ratios, mainly because good times have not been used for deficit reduction.

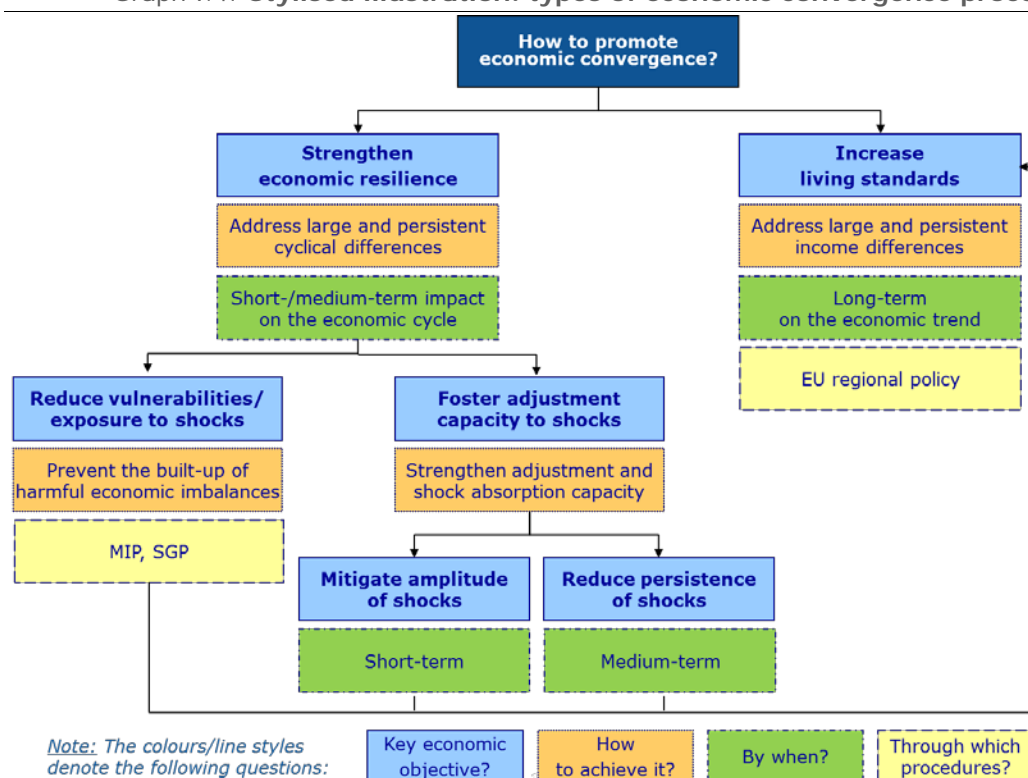
Is there a trade-off between the amplitude and persistence of a shock? The empirical evidence is mixed. It should, however, be acknowledged that

⁽¹⁷⁾ Sánchez, A., Rasmussen, M. and O. Röhn (2015), 'Economic resilience: What role for policies?', OECD Economics Department Working Papers, No 1251.

⁽¹⁸⁾ The Great Recession revealed the need to expand policy surveillance in Europe beyond the fiscal domain to cover macroeconomic developments. The MIP aims at identifying potential macroeconomic risks early on, preventing the emergence of harmful macroeconomic imbalances and correcting the imbalances already in place.

⁽¹⁹⁾ Dolls, M., Fuest, C. and A. Peichl (2012), 'Automatic stabilisers and economic crisis: US vs. Europe', *Journal of Public Economics*, 96, 279-294.

Graph I.4: **Stylised illustration: types of economic convergence processes**



(1) The European Semester aims at contributing to all the economic objectives listed above.

Source: DG ECFIN.

increased adjustment may come at a cost. For example, previous OECD work on resilience pointed to a trade-off in terms of reforms.⁽²⁰⁾ More flexible structures could lead to later shocks being larger in amplitude, although less persistent. In particular, some literature suggests that high levels of flexibility in labour markets may increase short-term volatility in output or employment in reaction to negative shocks.⁽²¹⁾ Recent work by the OECD is more sceptical about the existence of a trade-off.⁽²²⁾ In addition, Sánchez et al. (2015) conclude that 'less restrictive product market regulations can help lower the impact and reduce the persistence of shocks'. A faster recovery process after a shock may thus go hand in hand with smaller amplitude upon impact. Careful design of reforms and

avoidance of policy mistakes are important to escape such a trade-off.

The Great Recession demonstrated the importance of reducing the persistence of economic shocks for several reasons. First, slow speed of recovery poses risks of hysteresis. For example, lengthy unemployment spells lead to a loss of human capital, with permanent adverse consequences. Second, slow speed of recovery maximises risks of a political backlash (notably in terms of trust in national and European institutions).⁽²³⁾ Finally, if there is a trade-off between the amplitude of the shock and persistence, a bigger shock upon impact is an issue for stabilisation policies (whether at euro area or national level).

How to strengthen economic resilience? Empirical and theoretical evidence shows that flexible labour and product markets, in particular, can foster adjustment to shocks by significantly reducing the persistence of a shock. For instance, structural

⁽²⁰⁾ Duval, R., Elmeskov, J. and L. Vogel (2007), 'Structural policies and economic resilience to shocks', OECD Economic Department Working Papers, No 567.

⁽²¹⁾ Delong, J. and L. Summers (1986), 'Is increased price flexibility stabilizing?', NBER Working Paper No 1686; Gali, J. and T. Monacelli (2016), 'Understanding the gains from wage flexibility: the exchange rate connection', NBER Working Paper No 22489.

⁽²²⁾ Sutherland, D., and P. Hoeller (2013), 'Growth-promoting policies and macroeconomic stability', OECD Economics Department Working Papers, No 1091.

⁽²³⁾ Funke, M., Schularick, M. and C. Trebesch (2016), 'Politics in the Slump: Polarization and extremism after financial crises, 1870-2014', forthcoming, European Economic Review.

reforms can contribute to smoother reallocation of productive resources to more efficient firms, which would support faster recovery after a negative shock.

The next sections provide more details on the link between resilience and three policy areas, namely product and labour markets and taxation. This list represents three policy areas where little progress has been made in the euro area. The list is not exhaustive, and could easily be extended to include e.g. financial markets and/or public administration. For instance, in the area of financial markets significant progress has been achieved. However, more needs to be done to complete the Banking Union and to step up implementation and accelerate reform to establish a Capital Markets Union.

I.4. Product markets

Importance for resilience

There is some empirical work, mostly by the OECD, suggesting that product markets have an impact on economic resilience. This literature shows that structural rigidities can significantly slow down the speed of adjustment as measured, for instance, by the change in the output gap. The speed of adjustment notably depends on the extent to which both prices and quantities respond to shocks. For example, lower amplification and persistence of shocks is found to be associated with lower state control⁽²⁴⁾ and fewer barriers to entrepreneurship.⁽²⁵⁾ Canova et al. find that countries which have advanced more in terms of product market reforms are at the top of the resilience ranking.⁽²⁶⁾

How can policies affect the economic adjustment to shocks?

Product market policies can support economic adjustment mainly via two channels, namely price flexibility and the reallocation of resources.

Price flexibility

Price flexibility is crucial not only to recover losses in competitiveness, but also to allow adjustment of relative prices, which is central to provide appropriate signals for the reallocation of capital and labour across sectors and firms. Flexibility of prices of goods and services is to a large extent determined by wage flexibility, although this connection may be weaker when the production technology is more energy- or capital-intensive. Lack of competition and regulation are other factors that affect price reactivity to shocks.⁽²⁷⁾ Dhyne et al. find that price flexibility is strongly reduced when prices are regulated.⁽²⁸⁾ Some countries have such price regulations, for example Luxembourg and Germany in regulated professions. Álvarez et al. conclude that prices in the euro area are sticky, and more so than in the US.⁽²⁹⁾

Reallocation of resources

An important policy priority is ‘to create the conditions for the most productive firms to expand quickly and attract resources. This depends on well-functioning product and labour markets, a financial system that channels capital to dynamic firms, and policies that prevent resources from becoming trapped in unproductive firms, such as efficient judicial systems and bankruptcy laws.’⁽³⁰⁾ When such conditions are in place, economies can adjust more swiftly to shocks. Resilience therefore also has a strong reallocation dimension. Literature on this reallocation process is rather thin but we

⁽²⁴⁾ Sutherland, D., and P. Hoeller (2013), ‘Growth-promoting policies and macroeconomic stability’, OECD Economics Department Working Papers, No 1091.

⁽²⁵⁾ Ziemann, V. (2013), ‘Do structural policies affect macroeconomic stability?’, OECD Economics Department Working Papers, No 1075.

⁽²⁶⁾ Canova, F., Coutinho, L. and Z. Kontolemis (2012), ‘Measuring the macroeconomic resilience of industrial sectors in the EU and assessing the role of product market regulations’, DG ECFIN European Economy Occasional Papers, No 112. Canova et al. define resilience using the estimated correlation between sectoral output changes over the business cycle and common shocks.

⁽²⁷⁾ Monteagudo, J., and A. Dierx (2009), ‘Economic performance and competition in services in the euro area: Policy lessons in times of crisis’, DG ECFIN European Economy Occasional Papers, No 53.

⁽²⁸⁾ Dhyne, E., Konieczny, J., Rumler, F. and P. Sevestre (2009), ‘Price rigidity in the euro area: An assessment’, DG ECFIN European Economy Occasional Papers, No 380.

⁽²⁹⁾ Álvarez, L., Dhyne, E., Hoeberichts, M., Kwapil, C., le Bihan, H., Lünemann, P., Martins, F., Sabbatini, R., Stahl, H., Vermeulen, P. and J. Vilminen (2005), ‘Sticky prices in the euro area; A summary of new micro evidence’, ECB Working Paper, No 563.

⁽³⁰⁾ Draghi, M. (2016), ‘On the importance of policy alignment to fulfil our economic potential’, speech at the Fifth Annual Tommaso Padoa-Schioppa, Lecture at the Brussels Economic Forum 2016.

can draw some lessons from a related work stream that looks at the determinants of the misallocation of productive resources.

Allocative efficiency is the extent to which the most productive firms have the largest market shares within the sector. Allocative efficiency is generally higher in manufacturing (producing tradable goods and hence more exposed to international competition) than in services (which are generally more sheltered from international competition). In addition, there is a large variation across countries in sectoral allocative efficiency. In the event of severe misallocation of resources, we can logically expect the reallocation of productive resources to be hampered. Indeed, reallocation in terms of business dynamics has been shown to contribute to allocative efficiency. ⁽³¹⁾

A conclusion from a review of the literature on the drivers of capital and labour misallocation in the EU is that inflexible product market regulation is hampering the reallocation of productive resources. In addition, a substantial amount of work exists on the impact of the business environment on entry and exit of firms (which more directly reflect reallocation). For example, a recent ECFIN study analyses the role of red tape barriers to firm entry, and finds that the cost of starting a business, the number of procedures needed to start and formally operate a business, the time needed to export, and a proxy for public authorities' late payments all contribute negatively to firm entry. ⁽³²⁾ Another paper reports a positive relationship between efficiency of the justice system and firm entry. ⁽³³⁾ The World Bank reviews the literature on the impact of effective insolvency regimes on entrepreneurship, and reports for example on a study which found that the probability of starting a business is much higher in US states with higher bankruptcy exemptions for personal property. ⁽³⁴⁾

To conclude, in the area of product markets the literature has identified a number of drivers of price flexibility and resource reallocation. These

refer to: facilitation of market entry of new firms; an effective and efficient insolvency framework that would facilitate redeployment of resources and a second chance for entrepreneurs; a friendly environment for doing business; a well-functioning justice system and public administration; the suppression of corruption, including in public procurement practices; availability of high-quality public infrastructure; and a regulatory framework that is conducive to competition (including effective implementation of competition law).

I.5. Labour markets

Importance for resilience

In the area of labour markets, a growing body of literature emphasises the importance of the interaction of shocks with institutions. ⁽³⁵⁾ Its focus is on how labour market institutions may influence the capacity of an economy to adjust to a shock, once it hits. The results of this literature emphasise the importance of the design of labour market institutions for strengthening economic resilience.

How can policies affect the economic adjustment to shocks?

Institutions shape the immediate response of output or employment to negative external or internal shocks. For example, indexation clauses in labour contracts and the level and structure of collective bargaining affect macroeconomic performance. The main conclusions of research in this area ⁽³⁶⁾ suggest that either highly decentralised or highly centralised wage-setting systems support wage developments that are in line with productivity growth. ⁽³⁷⁾ The idea being that wage bargaining at national level may better perceive and reflect aggregate trends and more effectively

⁽³¹⁾ European Commission (2013), 'Product Market Review 2013: Financing the real economy', DG ECFIN European Economy, No 8.

⁽³²⁾ Ciriaci, D. (2014), 'Business dynamics and red tape barriers', European Economy Economic Papers, No 532.

⁽³³⁾ Lorenzani, D., and F. Lucidi (2014), 'The economic impact of civil justice reforms', European Economy Economic Papers, No 530.

⁽³⁴⁾ World Bank (2014), 'Debt resolution and business exit: Insolvency reform for credit, entrepreneurship, and growth', viewpoint.

⁽³⁵⁾ Acemoglu, D., Johnson, S., Robinson, J. and Y. Thaicharoen (2003), 'Institutional causes, macroeconomic symptoms: volatility, crises and growth', *Journal of Monetary Economics*, 50, 49-123; Rodrik, D. (1999), 'Where did all the growth go? External shocks, social conflict and growth collapses', *Journal of Economic Growth*, 4, 385-412.

⁽³⁶⁾ Calmfors, L. and J. Driffill (1988), 'Centralisation of wage bargaining', *Economic Policy*, 6(April), 13-61; Bruno, M. and J. Sachs (1985), 'The economics of worldwide stagflation', Oxford, Basil Blackwell; Sockice, D. (1990), 'Wage determination: The changing role of institutions in advanced industrial countries', *Oxford Review of Economic Policy*, 6(4), 36-61 and Layard, R., Nickell, S. and R. Jackmann (1991), 'Unemployment: macroeconomic performance and the labour market', Oxford University Press.

⁽³⁷⁾ Calmfors, L. (1993), 'Centralisation of wage bargaining and macroeconomic performance — a survey', *OECD Economic Studies*, 21, winter, 159-191.

coordinate wage changes for the economy as a whole, while wage bargaining at the individual and firm level may allow wage developments to more closely reflect individual qualifications and local labour market conditions. Prominent research into institutions influencing the quantity of labour includes Boeri, et al. (2001).⁽³⁸⁾ This study finds that restrictions on firing, including dismissal and redundancy procedures, imposed the greatest restraint on firms in terms of adjusting their work force in the response to shocks. Under overly strict employment protection legislation, dismissals are costly, hence employers will fill vacancies only with well-matched employees, reducing hires in cyclical upturns and increasing long-term unemployment (also through hysteresis effects). Firms will also reduce layoffs during downturns if dismissal costs are high, reducing short-term unemployment. The concept of ‘flexicurity’ strikes a balance between flexible job arrangements and secure transitions between jobs. It includes four policy components: (i) flexible and reliable contractual arrangements; (ii) comprehensive lifelong learning strategies; (iii) effective active labour market policies; and (iv) modern social security systems providing adequate income support during employment transitions.⁽³⁹⁾ Recent studies emphasise the importance of well-designed activation policies⁽⁴⁰⁾ and low rates of taxation on labour to maximise the potential to create more and better jobs.

The results of these studies hold important policy implications. They suggest that while social security buffers are a key element of Europe’s social model of choice, overly stringent employment protection legislation can generate labour market ‘dualism’, by favouring insiders (for instance typically prime-aged males) and making it even more difficult for outsiders (such as young and female workers) to enter (quality) jobs. In the recent crisis, Spain is an example of a country whose experiences of a dramatic rise in unemployment was closely linked with labour market dualism created by high employment protection legislation (EPL) on standard contracts and low EPL on temporary contracts. Overly rigid job protection may lead to

less labour market resilience, by making it more costly to reallocate labour. It suggests that social safety nets should focus on protecting the worker, rather than protecting the job, e.g. via flexicurity systems.

The euro area labour market adjusted only slowly to the Great Recession. While unemployment rates have declined in the euro area since 2013, the labour market situation remains relatively weak as evidenced in particular by the high structural unemployment rates.⁽⁴¹⁾ Several studies explain the slow labour market adjustment with weak design features of labour market institutions. Research considers specifically how the presence of rigid institutions might prevent wages from adjusting, workers from moving to new jobs, and unemployment from returning to equilibrium in response to a shock, thus increasing the persistence of a shock’s negative impact on unemployment or output.⁽⁴²⁾

Studies such as Blanchard and Portugal argue that some labour market institutions, such as benefit systems and employment protection with insufficient or badly designed activation policies, increase the duration of unemployment by making the unemployed less attractive to potential employers (since skills depreciate as unemployment duration increases and since the unemployed may become demotivated and stop searching altogether).⁽⁴³⁾ A lack of incentives to participate in the labour market or to return to work as fast as possible can therefore also reduce participation and/or increase unemployment rates. This literature also stresses that labour market institutions affect the composition of the unemployed. For example, a minimum wage that is too high can increase the effect of adverse shocks on the unemployment rate of less educated workers or the young. Since the wage is fixed, it can also weaken the equilibrating role of wages in reducing unemployment. Collective bargaining systems, if they primarily reflect the preferences

⁽³⁸⁾ Boeri, T., Garibaldi, P. and M. Macis (2001), ‘The concept and measurement of European labour market adaptability’, Issues Paper.

⁽³⁹⁾ See European Commission (2007), ‘Communication towards common principles of flexicurity: More and better jobs through flexibility and security’, June.

⁽⁴⁰⁾ See, for example, Andersen, M. and M. Svarer (2007), ‘Flexicurity — Labour market performance in Denmark’, CESifo Working Paper Series, No 2108.

⁽⁴¹⁾ Deroose, S. and P. Mohl (2016), ‘Recovery from the global economic and financial crisis in the euro area in the US: Not so different after all?’, *Revue bancaire et financière/Bank- en Financierwezen*, 2016/4, 276-287.

⁽⁴²⁾ Blanchard, O and J. Wolfers (2000), ‘The role of shocks and institutions in the rise of European unemployment: The aggregate evidence’, *The Economic Journal*, 110, C1- C33.

⁽⁴³⁾ Blanchard and Wolfers (2000) provides a review of the main channels of this research. Blanchard, O. and P. Portugal (1999), ‘What hides behind an unemployment rate. Comparing Portuguese and U.S. unemployment’, NBER Working Paper, No 6636.

and labour market prospects of prime-aged workers, may reduce the responsiveness of wages to youth unemployment, leading to greater persistence in unemployment. This body of literature therefore emphasises how the design of existing institutions in Europe can perpetuate and complicate the negative effects of economic shocks on employment and growth. It may suggest a role for public employment offices to support activation and the retention of workers' skills. It further suggests the need for flexibility in wage-setting institutions to allow firms to adjust to economic downturns. Wage flexibility is also important if wages are to provide the appropriate signals for labour market mobility between jobs, industries, occupations and locations in response to labour market stimuli ⁽⁴⁴⁾ and for individuals and firms to invest in human capital — this, in turn, is important in preparing the workforce for changing demands made by e.g. technological progress.

One adjustment channel that has received less attention until more recently is adjustment through hours of work. Flexible working-time arrangements and crisis measures in several euro area countries helped euro area firms to adjust, survive and retain their skilled workers at the beginning of the Great Recession. ⁽⁴⁵⁾ Flexitime and the legal assurance of easy conversion between full-time and part-time contracts can allow firms to adapt employment and enable workers to more easily combine work with personal lives, potentially drawing the non-employed into the labour force.

The above body of work suggests that flexible labour market policies, along with adequate social protection for individuals, can facilitate labour market adjustment and improve the economy, while at the same time providing workers with a better degree of labour market attachment, financial security and skills support.

I.6. Taxation

Importance for resilience

A well designed tax system can also play a role in ensuring resilient economic structures. By contrast, features of national tax systems that encourage

excessive corporate and household leverage raise vulnerability to shocks and hamper adjustment. Policies aiming at removing such tax distortions help reduce the risk of exposure to adverse shocks and facilitate adjustment to such shocks.

A bias towards debt financing for companies is created when interest payments are deductible from the corporate income tax base, while returns on equity (such as dividends paid to shareholders) are not. The debt bias in corporate taxation may affect companies' capital structure by encouraging them to finance investment through debt rather than equity. In turn, the corporate capital structure affects the economy's exposure to adverse shocks. With rising indebtedness, the ability to repay becomes progressively more sensitive to falls in income or sales and to interest rate rises. ⁽⁴⁶⁾ Moreover, in an economic downturn, the burden of interest costs and capital repayments is likely to lead highly indebted firms to reduce investment, output and employment more severely than less leveraged firms. ⁽⁴⁷⁾

Tax breaks for housing, such as mortgage interest deductibility, also create a bias in favour of debt-financed house purchases. Mortgage interest tax relief allows the taxpayer to deduct mortgage interest payments from taxable income. This type of tax incentive, combined with low interest rates and looser lending conditions, may have a non-negligible role in the dynamics of house prices and mortgage debt. This situation may pose serious risks, for example in situations where household earnings fall or the number of households with negative housing equity increases due to lower house prices during economic downturns. Van den Noord (2003) finds that generous tax relief on mortgage interest payments is correlated with house prices and mortgage debt, while Andrews et al. (2011) suggest that the impact of a positive demand shock on real house prices is greater in OECD countries offering more generous housing tax relief on debt financing costs. ⁽⁴⁸⁾ ⁽⁴⁹⁾

⁽⁴⁴⁾ Beatson, M. (1995), 'Labour market flexibility', Employment Department Research Series, No 48, Moorfoot, Sheffield, UK.

⁽⁴⁵⁾ Balleer, A., Gehrke, B., Lechthaler, W. and C. Merkl (2016), 'Does short-term work save jobs? A business cycle analysis', European Economic Review, 84, 99-122.

⁽⁴⁶⁾ Cecchetti, S., Mohanty, M. and F. Zampoli (2011), 'The real effects of debt', Bank of International Settlements Working Paper, No 352.

⁽⁴⁷⁾ ECB (2014), 'Deleveraging patterns in the euro area corporate sector', ECB Monthly Bulletin, February, 97-114.

⁽⁴⁸⁾ Van den Noord, P. (2003), 'Tax incentives and house price volatility in the euro area: theory and evidence', OECD Economics Department Working Paper, No 356.

⁽⁴⁹⁾ Andrews, D., Sanchez, A. and A. Johansson (2011), 'Housing markets and structural policies in OECD countries', OECD Economics Department Working Paper, No 836.

How can tax policies affect economic adjustment to shocks?

Tax biases towards corporate debt and debt-financed house purchases can be curtailed by limiting or removing tax incentives that contribute to debt accumulation.

Debt bias in corporate taxation

The debt bias in corporate financing can be addressed by limiting the deductibility of interest costs or by extending the deductibility allowance to equity financing. Most countries have some form of limit on interest deductibility such as ‘thin capitalisation’ rules (i.e. ceilings on the proportion of capital that can be made up of debt), but these reduce the debt bias only to some extent. Belgium and Italy allow a notional cost of equity to be deducted. Empirical evidence shows that an allowance for the deduction of equity costs has an impact on financial and non-financial companies’ leverage. Panier et al. (2013) finds that this type of allowance raised the equity-to-asset ratio of non-financial companies in Belgium.⁽⁵⁰⁾ The debt-to-equity ratio of financial companies also declined.⁽⁵¹⁾ Empirical evidence suggests that changes in the statutory corporate tax rates also have an impact on the capital structure of companies and their leverage. For example, a higher statutory tax rate increases the debt-to-asset ratio for both non-financial and financial companies.⁽⁵²⁾

Housing taxation and household debt

The debt bias in favour of debt-financed house purchases can be addressed by limiting the generosity of tax deductibility for mortgage interest payments. The tax systems in many Member States favour investment in owner-occupied housing, partly by allowing mortgage interest tax relief, in order to promote home ownership. However, this relief creates incentives for households to borrow and to consume owner-occupied housing rather than rental housing. Particularly if housing supply

is relatively inelastic, a lower after-tax cost of debt may contribute to higher demand for housing, raising house prices and household debt. Hilber and Turner (2014) find evidence that reduced interest costs due to taxation favouring owner-occupied housing through interest deduction tend to be capitalised into higher house prices.⁽⁵³⁾ If house prices rise as a result of the debt bias, the tax relief policy does not necessarily achieve its objective of increasing home affordability, but contributes to higher household debt levels. When combined with substantial transaction costs of changing residence, the propensity to higher owner-occupied housing may also reduce the mobility of workers. Following the crisis, mortgage interest tax relief for new loans was removed in Ireland and Spain; it is being reduced gradually in Finland and the Netherlands.

I.7. Conclusions

It should be emphasised that structural reforms are beneficial to the economies mainly for productivity-enhancing reasons irrespective of the single currency. Furthermore, in a currency union with the absence of flexible nominal exchange rates, euro area Member States need to respond to economic shocks via internal adjustment processes. Available evidence clearly indicates that rigid markets slow down this adjustment capacity with potential adverse effects on the economy.⁽⁵⁴⁾ For example, excessive credit growth alongside slow price adjustment and excessive wage growth well above productivity, and excessive protection legislation delaying the reallocation of labour have been cited as major factors contributing both to the loss of competitiveness in the periphery countries of the euro area before the crisis and to the sluggish adjustment process following the Great Recession. Finally, it remains vital for the resilience of the euro area economies to prevent and correct macroeconomic imbalances before they get out of hand.

In the run-up to the introduction of the euro, there was a belief that the common currency itself would work as an incentive for reform towards resilient economic structures. Despite the potentially large positive long-term benefits to growth, this did not

⁽⁵⁰⁾ Panier, F., Perez-Gonzalez, F. and P. Villanueva (2013), ‘Capital structure and taxes: What happens when you (also) subsidize equity?’, Stanford University Working Paper.

⁽⁵¹⁾ Schepens, G. (2016), ‘Taxes and bank capital structure’, *Journal of Financial Economics*, 120(3), 585-600.

⁽⁵²⁾ Mooij, R. de (2011), ‘The tax elasticity of corporate debt: A synthesis of size and variations’, IMF Working Paper, No 11/95; Keen, M. and R. de Mooij (2012), ‘Debt, taxes and banks’, IMF Working Paper 12/48.

⁽⁵³⁾ Hilber, C. and T. Turner (2014), ‘The mortgage interest deduction and its impact on homeownership decisions’, *The Review of Economics and Statistics*, 96(4), 618-637.

⁽⁵⁴⁾ Mohl P. and T. Walsh (2015), ‘Revisiting the relative price mechanism’, *Quarterly Report on the Euro Area*, Vol. 14, No 4.

materialise. The record on structural reform has been far from satisfactory. Since the crisis, despite some progress with structural reform, particularly in the programme countries, reform progress across the euro area remains low. As a result, many Member States exhibit a low degree of economic resilience leading to long and deep adjustment periods.

Progress with reform would help to support convergence by both increasing Member States' resilience to economic shocks and boosting their potential growth, incomes and standards of living. Sustainable convergence would therefore require more efficient labour and product markets and stronger public institutions to enable euro area Member States to benefit from their comparative advantages within the Single Market. This, in turn, would contribute to strengthen inclusive growth.

Despite the potentially large positive long-term benefits to growth, some of the short-term impact of structural reforms on economic activity may be negative when monetary policy is constrained at the zero lower bound (i.e. when interest rates are close to zero and cannot be reduced much further).⁽⁵⁵⁾ As a consequence, reforms should be tailored to minimise short-term negative effects, and complementarities among reforms could be sought to increase the positive effects.

Ambitious structural reforms have the potential to facilitate the necessary economic adjustment within the euro area and to boost growth in the countries that implement them. If carried out jointly across Member States, they offer benefits to the euro area as a whole through positive spillover effects.⁽⁵⁶⁾

⁽⁵⁵⁾ Eggertsson, G., Ferrero, A. and A. Raffo (2014), 'Can structural reforms help Europe?' *Journal of Monetary Economics*, 61 (C), 2-22. Vogel, L. (2016), 'Structural reforms at the zero bound', [European Journal of Political Economy](#), in press: available online 31 August 2016.

⁽⁵⁶⁾ Varga J. and Jan in 't Veld (2013), 'The growth impact of structural reforms', *Quarterly Report on the Euro Area*, Vol. 12, No 4.

II. The policy mix, when monetary policy is constrained at the zero lower bound

The scope of macroeconomic policy making in the euro area is being intensely debated. Decision makers confront the challenge of a persistently slow and fragile economic recovery where policy efforts are unequally distributed across available instruments. Aggregate demand growth remains sluggish and inflation well below target despite the fact that monetary policy rates are at the zero lower bound (ZLB) and that the European Central Bank has employed a wide range of conventional and unconventional policy measures. At the same time, national fiscal policies are expected to stay within the perimeters of commonly agreed EU rules, namely the Stability and Growth Pact, while progress with structural reforms could be accelerated.

This section analyses the macroeconomic policy mix of the euro area at the current juncture. It first reviews the monetary policy stance by looking at two measures in the context of a low demand and low-inflation environment keeping in mind the degree of uncertainty of such an exercise: the shadow policy rate, which is the theoretical negative rate that would prevail if there were no lower bound on interest rates; and the equilibrium interest rate, the real rate at which inflation would be stable. Second, it takes a look at fiscal policy making by focusing on both the stance of the euro area as a whole and differences between Member States. The section concludes with an overall assessment of the macroeconomic policy mix.

Our analysis suggests that while equilibrium interest rates experienced a significant decline in recent years, the current monetary policy stance of the ECB as measured by shadow rates appears to be very accommodative. However, monetary policy has already provided considerable support and cannot carry the full burden of the policy effort nor address country-specific issues. Consequently, there is a need to pay more attention to fiscal policy in terms of both its aggregate stance and its composition and use in different euro area countries, naturally within the limits of the Stability and Growth Pact. ⁽⁵⁷⁾

II.1. Introduction

Ever since Keynes' exegetes formalised the macro model which would become the main reference for generations of economists and policy makers, fiscal and monetary policy have been used to respond to changes in aggregate economic activity in the short term. While faith in the ability of policy makers to effectively manage aggregate demand has evolved – because our understanding of how the economy and politics work has evolved – fiscal and monetary policy remain the two canonical instruments for economic stabilisation. What has changed with time is the way the two instruments are deployed. The early approach of fine tuning fiscal and monetary policies with the greatest possible degree of discretion, has given way to a framework where monetary and fiscal policy are assigned specific mandates which are expected to be implemented independently towards the common goal of macroeconomic stability. This is also the case in the euro area: monetary policy has been delegated to the ECB with a strong mandate

to achieve price stability, while fiscal policy remains under the purview of national governments, subject to commonly agreed fiscal rules.

In the last couple of years, the euro area has experienced a very sluggish pace of economic recovery with average growth rates falling well behind those recorded in the US plus a persisting and still significant amount of economic slack. Inflation remains well below target and aggregate demand, especially investment, remain weak. The ECB has pushed policy rates to the zero lower bound (ZLB) and launched a whole series of unconventional measures, mainly balance sheet policies, while fiscal policy is caught between limited fiscal space in some Member States (as a legacy of the crisis) and a strong preference for tight budgets in others (e.g. due to ageing challenges, perception of hidden liabilities).

Against this background, the question has been raised of whether the prevailing governance framework of the euro area can deliver a policy mix that provides sufficient support to aggregate economic activity while preserving stability.

⁽⁵⁷⁾ The section was prepared by Nicolas Carnot, Ulrich Clemens, Martin Larch and Bořek Vašíček.

The remainder of this section is divided into four parts aimed at offering a reasoned analysis of the macroeconomic policy mix in the euro area. Section II.2 and II.3 provide an in-depth review of monetary and fiscal policy respectively, while Section II.4 examines the way monetary and fiscal policy interact in the current governance framework. Section II.5 concludes.

II.2. Monetary policy stance at the zero lower bound

Measuring the monetary stance

Traditionally, the most important indicator for a central bank's monetary policy stance is the nominal rate charged on its main refinancing operations. This rate is typically assessed against historical or normative benchmarks to gauge the appropriateness of the level of monetary policy accommodation. In the past several years, however, the convergence of policy rates towards the ZLB, alongside the adoption of unconventional measures targeting the longer end of the yield curve (such as large scale asset purchases or forward guidance), have affected the merits of nominal policy rates as summary indicators of the monetary policy stance.

As a consequence, alternative measures to capture the monetary policy stance in the presence of the lower bound have been put forward. Most prominently, so-called shadow short rates (SSRs) derived from term-structure models have been used to quantify the monetary stimulus implied by measures beyond variations of the policy rates. The shadow policy rate, or shadow short rate, represents the interest rate that would prevail in a hypothetical world where economic agents cannot turn to cash at the ZLB, thereby enabling interest rates to fall arbitrarily deep into negative territory.⁽⁵⁸⁾ It is computed by estimating the price of this 'cash option' and subtracting it from the observable short-term rate, which is truncated at the ZLB.⁽⁵⁹⁾

The monetary policy stance is accommodative

Graph II.1 shows estimates of the shadow short rate for the euro area obtained from different modelling approaches suggested in the literature. ⁽⁶⁰⁾ Up to mid-2012, the estimated shadow rates follow a relatively homogeneous path, which seems consistent with ECB decisions. From October 2008, when the ECB started a rate cutting cycle and introduced a first set of non-standard measures to dampen the impact of the global financial crisis, including the fixed-rate full-allotment mode for its refinancing operations, the shadow short rates follow a steep downward trend up to May 2009. They then capture the temporary tightening of monetary policy in the first half of 2011 before declining into negative territory in late 2011, as a new rate cutting cycle was launched and the ECB announced two three-year long-term refinancing operations (LTROs) in December 2011. The estimates, however, show some heterogeneity from mid-2012 onwards, reflecting in particular the varying extent to which the different estimates incorporate the effects of the ECB's forward guidance as well as the LTRO repayments, before following a common steep downward trend with the start of the Extended Asset Purchase Programme (EAPP) in March 2015.

At the same time, Graph II.1 also illustrates one of the major drawbacks of the SSR concept. While the SSR intuitively extends the concept of the policy rate beyond the ZLB, opening up to the possibility

⁽⁶⁰⁾ Wu, J. C. and F. D. Xia (2014), 'Measuring the macroeconomic impact of monetary policy at the zero lower bound', *Journal of Money, Credit and Banking*, Vol. 48, Issue 2-3 pp. 253–291.

Krippner, L. (2016), 'Documentation for measures of monetary policy', Reserve Bank of New Zealand, available at <http://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Research/Additional%20research/Leo%20Krippner/5892888.pdf?la=en>

ECFIN estimates are calculated according to Krippner's (2016) two-factor arbitrage-free Nelson Siegel yield curve model (K-ANSM model). Although the ECB deposit facility rate currently stands at -0.40%, as a working assumption, it was chosen to calibrate the K-ANSM (2) model for the Euro Area using -0.50% as the fixed lower bound, representing market expectations regarding a further rate cut in the future. This compares to a positive 0.125% fixed lower bound used in Krippner's model calibration as shown in Graph II.1, which results in a significantly more negative shadow rate. Furthermore, ECFIN estimates are calibrated exclusively to the OIS curve as to avoid any undue distortion to calibration results caused by the combination of OIS and government bond rates as is done in Krippner (2016).

Lemke and Vladu (2016) provide an extension of the shadow rate concept to the whole term structure.

Lemke, W. and A. Vladu (2016), 'Below the zero lower bound - a shadow-rate term structure model for the euro area', Deutsche Bundesbank Working Paper, No. 32/2016.

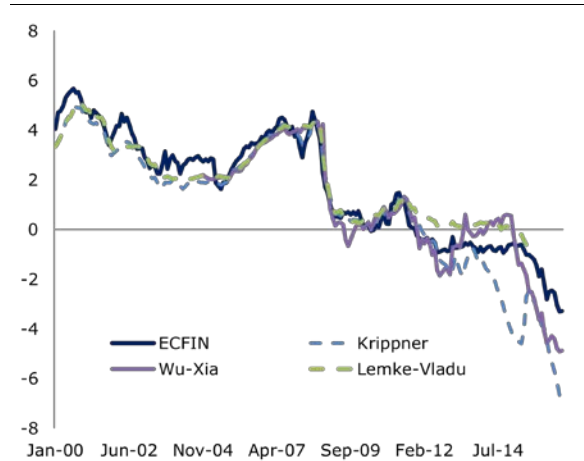
⁽⁵⁸⁾ The existence of transaction and storage costs of cash holdings might explain the fact that the actual lower bound is below zero, such that depositors would accept negative rates to a certain extent.

⁽⁵⁹⁾ Black, F. (1995), 'Interest rates as options', *Journal of Finance*, Vol. 50, Issue 5, pp. 1371-1376.

Krippner, L. (2012), 'Modifying Gaussian term structure models when interest rates are near the zero lower bound', Reserve Bank of New Zealand Discussion Paper, No. 2012/2.

of assessing monetary policy through time on the basis of one familiar gauge, some words of caution are in order. First, the estimated level is very model-sensitive, reflecting the number of factors included in the model, the assumed or endogenously estimated lower bound, the estimation method and the maturity spectrum included in the estimations.

Graph II.1: **Alternative shadow rate estimates**
(Jan 2000 – Aug 2016, %)



Source: ECFIN estimates are by U. Clemens and E. McCoy modifying Krippner (2013), Krippner (2013), Wu and Xia (2016), Lemke and Vladu (2015).

Second, since the SSR model is calibrated to the Overnight Indexed Swap (OIS) curve, the derived shadow rate will inevitably reflect market expectations of nominal short-term interest rates. However, many factors other than policy changes may affect such expectations, including changes in short-run market sentiments and longer-term growth prospects. As a result, the SSR is likely to be a noisy indicator of the policy stance, especially in times of heightened market volatility and uncertainty concerning growth prospects.

Graph II.1 shows that the SSR is estimated to be negative since 2015. However, it is important to stress that this is a non-observed variable whose calculation is surrounded by uncertainty and dependent on technical details. It would be inappropriate therefore to jump to firm conclusions regarding the monetary policy stance on the basis of the SSR.

Keeping the uncertainty surrounding the estimated level of SSRs in mind, Graph II.1 shows that most measures including estimates produced by DG ECFIN seem to suggest a considerable degree of

monetary easing over the past years, in particular following the introduction of the Public Sector Purchase Programme (PSPP) in 2015.

The equilibrium interest rates are declining

While policy rates and shadow short rates provide some intuition of how the monetary policy stance has evolved *over time*, to evaluate its degree of accommodation *at a given moment*, some benchmark is needed. Besides historical comparisons (which might not always be appropriate) and normative benchmarks such as the Taylor rule (which are model sensitive),⁽⁶¹⁾ a simple albeit economically intuitive approach is to compare the *real ex-ante* interest rate (i.e. the short-term rate adjusted for expected inflation) with the equilibrium or natural rate of interest. The equilibrium rate - a concept introduced by Wicksell in the 1930s - regained popularity since policy rates replaced monetary aggregates as an intermediate policy target under the inflation targeting regime.⁽⁶²⁾ The equilibrium rate is usually understood as a real rate equating supply and demand of loanable funds, and it is consistent with output at potential and stable inflation. It is determined by structural factors of the economy, such as potential growth, and its value is independent of monetary policy, which uses the equilibrium rate as a reference value. Therefore, if the actual real interest rate is lower than equilibrium rate, the monetary policy stance is considered expansionary. Conversely, if the actual interest rate is higher than the equilibrium rate, the monetary policy stance is considered contractionary.

⁽⁶¹⁾ When the policy rates are not constrained by the ZLB, the Taylor rule, which prescribes the optimal policy rate with regard to developments in inflation (expectations) and output, is often used as such benchmark. However, the weights on the respective determinants are somewhat arbitrary, and the choice of variables (e.g. expected vs realized inflation, output gap vs output growth) is subject to debate. The Taylor rule cannot be directly used neither as prescription for not as a description of monetary policy at the ZLB. Belke and Klose (2013) propose a modification of the Taylor rule for the ZLB environment assuming that real rather than nominal interest rates is targeted by the central bank. Belke, A. and J. Klose (2013), 'Modifying Taylor reaction functions in the presence of the zero-lower-bound - Evidence for the ECB and the Fed', *Economic Modelling*, Vol. 35, pp. 515-527.

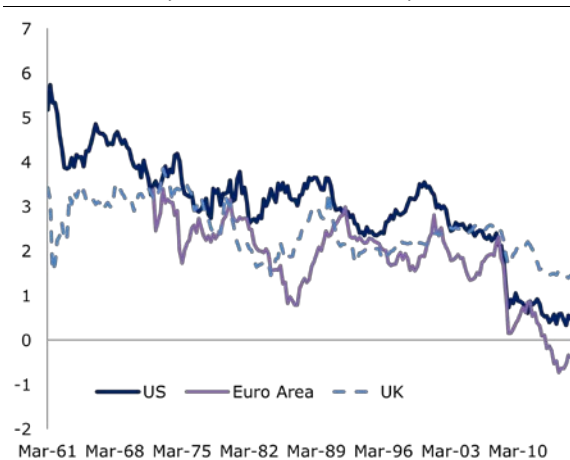
⁽⁶²⁾ Wicksell, K. (1936), 'Interest and Prices', MacMillan, London. Woodford, M. (2003) 'Interest and Prices: Foundations of a Theory of Monetary Policy', Princeton University Press, Princeton N.J..

Svensson, L.E.O. and M. Woodford (2004), 'Implementing optimal policy through inflation-forecast targeting', In: *The inflation-targeting debate*. University of Chicago Press, pp. 19-92.

Like the shadow short rate, the equilibrium rate of interest is not directly observable; it must be estimated and is subject to model uncertainty. Moreover, as the structural characteristics of an economy evolve over time, the equilibrium rate will change, adding another layer of uncertainty to the assessment of the monetary policy stance, especially in real time. Finally, there is some ambiguity regarding the maturity of the equilibrium rate. While the original Wicksellian logic deems it to be a long-term concept, its use in policy discussions (benchmark for short-term policy rates) as well as common estimation methods implicitly treat it as a short-term concept.⁽⁶³⁾

Most available estimates indicate that equilibrium rates have followed a declining trend which accentuated in the wake of the global financial crisis. Graph II.2 indicates a drop from 3-4% in 1980s to around 0% in recent years or even negative values in the euro area.⁽⁶⁴⁾ Several factors are believed to drive the trend: a general slowdown in productivity growth, declining investment ratios, demographic aging, changes in financial regulation, and global developments including demographic changes and an increase in inequality.⁽⁶⁵⁾

Graph II.2: **Equilibrium real interest rate estimates**
(1961Q1 – 2015Q4, %)



Source: Holston, S., T. Laubach and J. Williams (2016), 'Measuring Natural Rate of Interest - International Trends and Determinants', Federal Reserve Bank of San Francisco Working Paper, No. 2016-11.

The use of equilibrium interest rates as a reference value is not straightforward at the ZLB when monetary policy turns to unconventional measures. In the absence of the ZLB, the policy rate broadly corresponds to the short-term financing costs faced by economic agents and thus can be compared to the equilibrium rate. In times when the ZLB is binding, economic agents are facing short-term rates at the ZLB, while the hypothetical shadow short rate representing the central bank's policy stance might decrease deeper into negative territory. Hence, a dichotomy appears between alternative measures of the policy stance such as the shadow rate, which is constructed to overcome the ZLB, and the fact that interest rates relevant for economic decisions, namely the lending rates, are still subject to the ZLB. The shadow rate may be estimated with too much uncertainty to be directly comparable to the (also uncertain) equilibrium interest rate. However, one can evaluate the relative dynamics of these two variables, specifically the relative decline in the estimated equilibrium rate of interest vis-à-vis the relative decline in the estimated shadow rate. A comparison of Graphs II.1 and II.2 suggests that while the equilibrium rate of interest declined since the global financial crisis, the shadow short rate as an implicit measure of the policy rate declined too.

⁽⁶³⁾ Laubach and Williams (2003) provide arguably the most popular empirical approach for the equilibrium interest rate estimation. Laubach, T. and J. Williams. (2003), 'Measuring the natural rate of interest', *Review of Economics and Statistics*, Vol. 85, No. 4, pp. 1063-1070.

Brzoza-Brzezina and Kotłowski (2014) and Imakubo et al. (2015) generalize the concept of natural rate of interest to the natural yield curve to provide natural values for the whole term structure, which might be useful when the central banks uses nonconventional measures that aim to affect directly the long-term maturities.

Brzoza-Brzezina, M. and J. Kotłowski, J. (2014), 'Measuring the natural yield curve', *Applied Economics*, Vol. 46, Issue 17, pp. 2052-2065.

Imakubo, K., H. Kojima and J. Nakajima (2015), 'The natural yield curve: its concept and measurement', Bank of Japan Working Paper, No. 15-E-5.

⁽⁶⁴⁾ This finding has been confirmed for the US by a range of different estimation methods. See for example:

Barsky, R., A. Justiniano and L. Melosi (2014), 'The Natural Rate of Interest and Its Usefulness for Monetary Policy', *American Economic Review: Papers & Proceedings*, Vol. 104, No. 5, pp. 37-43.

Curdia, V., A. Ferrero, G. C. Ng and A. Tambalotti (2015), 'Has U.S. Monetary Policy Tracked the Efficient Interest Rate?', *Journal of Monetary Economics*, Vol. 70(C), pp. 72-83.

Laubach, T. and J. Williams (2016), 'Measuring the Natural Rate of Interest Redux'. Board of Governors of the Federal Reserve System, Finance and Economics Discussion Series, No. 2016-011.

⁽⁶⁵⁾ IMF (2014), 'Perspective on Global Real Interest Rates', Chapter 3 in *World Economic Outlook* (April).

Hamilton, J.D., E. E. Harris, J. Hatzius and K. D. West (2015), 'The Equilibrium Real Funds Rate: Past, Present, and Future', Presented at the US Monetary Policy Forum, New York, February 27, 2015.

Rachel, L. and T. D. Smith (2015), 'Secular drivers of the global real interest rate', Bank of England, Staff Working Paper, No. 571.

Inflation remains below target

Despite substantial monetary easing, which has clearly had an effect at the early stages of the transmission mechanism as evidenced by both lower interest rates and a pick-up in credit provision to the private sector, headline inflation in the euro area (measured by HICP) has remained close to zero since the beginning of 2015. Also, core inflation - the annual rate of change of the HICP excluding volatile energy and unprocessed food - has hovered below 1% since 2014.

Following the observation that national Phillips curves have flattened in recent decades (i.e. that inflation has become less connected to the degree of domestic economic slack), several empirical studies have argued that an important part of inflation dynamics can be explained by international or even global factors rather than domestic developments, which may constrain the effectiveness of monetary policy.⁽⁶⁶⁾ However, while recent inflation trends in the euro area may in part be driven by exogenous forces they can still affect inflation expectations in the euro area and in turn the expected real interest rate.

Overall, monetary policy has delivered a substantial amount of stimulus to the euro area economy in the past several years, without which outcomes would have been considerably worse. At the same time, given the nature of current macroeconomic developments, monetary policy cannot shoulder stabilisation alone. Other macroeconomic policies matter as well.

II.3. Fiscal policy stance

Measuring the fiscal stance

The fiscal stance is a notion with no universally accepted definition but a broadly shared understanding within the economic community. Usually, the fiscal stance refers to the orientation that is given to fiscal policy by discretionary decisions on tax and spending, as opposed to the endogenous response of the economy.

While the fiscal stance is an intuitive notion, its empirical characterisation is a more open question.⁽⁶⁷⁾ Traditionally, the fiscal stance is captured by the change in the structural balance, or the change in the structural primary balance. In practice, both indicators are known to include a measurable degree of noise owing in particular to uncertainties over potential output and the size of budgetary elasticities.⁽⁶⁸⁾

An alternative and arguably more faithful indication of the actual policy stance is given by the so called discretionary fiscal effort (DFE).⁽⁶⁹⁾ This indicator focuses on the budgetary impact of new measures on the revenue side, and on the growth of discretionary spending relative to trend on the expenditure side. While the DFE raises measurement issues of its own, including for estimating new tax measures, it is considered to be a more robust gauge of the short-term impact on aggregate demand than the change in the structural (primary) balance.

In this perspective, fiscal policy is qualified as restrictive when the DFE is positive, expansionary when negative, and neutral when close to zero. The fiscal stance is thus regarded as neutral when discretionary government expenditures expand at a pace in line with medium-term growth and no new tax measures are taken in net terms, or more generally, when the gap between expenditure growth and potential growth equals the overall net amount of new tax measures.

⁽⁶⁶⁾ See for example: Ciccarelli, M. and B. Mojon (2010), 'Global inflation', *The Review of Economics and Statistics*, Vol. 92, No. 3, pp. 524–535.

Mumtaz, H. and Surico, P. (2012), 'Evolving international inflation dynamics: World and country-specific factors', *Journal of the European Economic Association*, Vol. 10, Issue 4, pp. 716–734.

⁽⁶⁷⁾ Blanchard (1990) offers a well-known discussion of fiscal indicators, including indicators of the discretionary part of fiscal policy.

Blanchard, O. J. (1990), 'Suggestions for a New Set of Fiscal Indicators', *OECD Economics Department Working Papers*, No. 79.

⁽⁶⁸⁾ The structural balance removes from the headline balance the effect of the economic cycle, based on an evaluation of potential output and the response of the public finances to the output gap, as well as net of one off and other temporary measures. For a presentation, see Larch and Turrini (2010) and Mourre et al. (2013).

Larch, M. and A. Turrini (2010), 'The cyclically-adjusted Budget balance in EU fiscal policy making: A love at first sight turned into a mature relationship', *Intereconomics*, Vol. 45, Issue 1, pp. 48–60.

Mourre, G., G.-M. Isbasoiu, D. Paternoster and M. Salto (2013), 'The cyclically-adjusted budget balance used in the EU fiscal framework: an update', *European Economy, Economic Paper*, No. 478.

⁽⁶⁹⁾ DG ECFIN (2013), 'Report on Public Finances in EMU', *European Economy*, No. 4/2013.

Carnot, N. and F. de Castro (2015), 'The discretionary fiscal effort: An assessment of fiscal policy and its output effect', *Hacienda pública española / Review of public economics*, 215–(4/2015), pp.63–94.

The above considerations focus solely on the first round effects of fiscal policy on aggregate demand, leaving aside other important concerns such as the medium to long-term impact on demand or supply side effects. The overall impact on demand is a function of the fiscal multiplier, which is known to be country- and time-dependent, and sensitive to the type of discretionary fiscal measure.⁽⁷⁰⁾ Therefore, a given fiscal stance as measured by the DFE will not always exert the same traction on output, given variations in circumstances and composition. Finally, time lags should be acknowledged too: the effect of fiscal policy in a given year combines the immediate effect of current policy with the incremental lagged effect of prior policies.

Analysing the recent fiscal stance

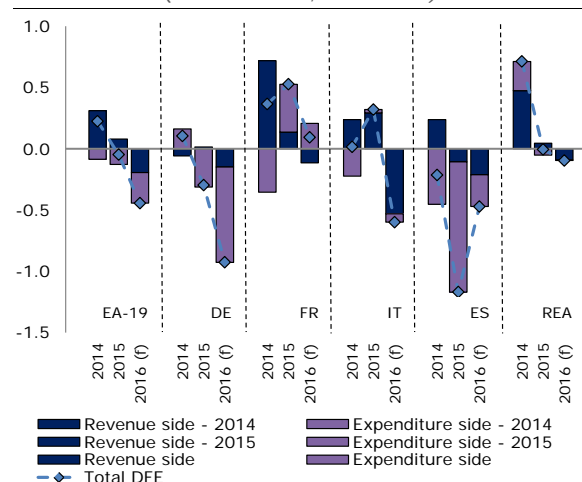
Following considerable retrenchment over 2011-2013, the euro area fiscal stance has on average been broadly neutral since 2014. Fiscal policy remained slightly restrictive in 2014, was neutral in 2015, and is expected to turn modestly expansionary this year (Graph II.3). This follows a cumulated consolidation of 3½ % of GDP over 2011-2013. ⁽⁷¹⁾

In terms of country contributions, Germany recently moved to an expansionary stance and contributes the major part of the projected fiscal easing in 2016, with Italy also easing this year along with continued loosening in Spain over the past three years. France pursued moderate consolidation in the recent past.

The characterisation of the fiscal stance as mildly expansionary this year should be put into perspective in three important respects. First, it follows considerable consolidation efforts earlier on. Second, the characterisation results in part from unusually low inflation and weak potential growth in the post-crisis environment which both lower the benchmark discriminating between an

expansionary and restrictive stance. Third, headline balances are projected to continue falling (area-wide by about 0.2% of GDP in 2016) as automatic stabilisers moderate with the economic recovery.

Graph II.3: Discretionary fiscal effort (1)
(2014 – 2016, % of GDP)



(1) (f) indicates forecasts. REA stands for rest of euro area. Source: Commission services spring 2016 forecast, DG ECFIN calculations.

In terms of composition, the recent move towards an easier stance reflects both a reversal from tax hikes to tax cuts and faster spending (Graph II.3 and Table II.1). While there were still a few tax increases in 2014-2015, including on taxes on consumption, policies on the revenue side are being loosened in 2016. This involves cuts in labour taxes and social contributions in many countries (including the four largest ones), and more residually lower corporate taxes as well as the removal of a property tax in Italy. Public spending is gathering moderate pace in the euro area, expanding overall by about 2½ in 2016 in nominal terms, against below 2% in 2014 and about 2¼ % in 2015. Because these figures are a bit higher than nominal medium-term growth (2.0% in 2016), this translates into a slight expansion according to the DFE indicator. However, as indicated above, the 'benchmark' nominal growth rates used in the EU fiscal framework reflect unusually low inflation rates and the weakness of potential growth estimates, which still incorporate lagged effects from the crisis. ⁽⁷²⁾

⁽⁷⁰⁾ For a comprehensive discussion see Batini, N., L. Eyraud, L. Forni and A. Weber (2014), 'Fiscal multipliers: size, determinants and use in macroeconomic projects', Technical notes and manuals, IMF Fiscal Affairs Department. See also in't Veld J. (2013), Fiscal consolidations and spillovers in the euro area periphery and core, European Economy, Economic Paper, No. 506.

⁽⁷¹⁾ The fiscal stance is appraised with the DFE but the overall conclusions since 2014 would not be very different using the change in the structural primary balance. The DFE is estimated at 0.2%, 0,0% and -0,4% of GDP in 2014, 2015 and 2016 respectively.

⁽⁷²⁾ The benchmark growth rate is a 10-year broadly centred average of potential growth.

Table II.1: **Expenditure dynamics and medium-term potential GDP growth (1)**
 (2014 – 2016, y-o-y % change)

	EA-19			DE			FR			IT			ES			REA		
	2014	2015	2016(f)	2014	2015	2016(f)	2014	2015	2016(f)	2014	2015	2016(f)	2014	2015	2016(f)	2014	2015	2016(f)
Discretionary expenditure growth (nominal)	1.8	2.3	2.6	2.6	4.2	5.1	2.2	1.5	1.6	1.0	0.5	0.9	1.0	3.7	1.8	1.2	2.0	2.3
Medium-term potential growth (nominal)	1.6	2.0	2.0	3.0	3.4	3.1	1.5	2.2	2.0	0.5	0.5	0.7	-0.2	0.8	1.1	1.5	2.0	2.1
<i>of which:</i>																		
medium-term potential growth (real)	0.7	0.7	0.8	1.3	1.3	1.3	1.0	1.0	1.0	-0.3	-0.2	-0.1	0.2	0.2	0.2	0.8	0.9	1.0
GDP deflator	0.9	1.3	1.2	1.7	2.1	1.8	0.6	1.2	1.0	0.8	0.8	0.8	-0.4	0.6	0.9	0.7	1.1	1.1

(1) Discretionary expenditure is total government expenditure net of one-offs, interest payments and non-discretionary unemployment expenditure.

Source: Commission services spring 2016 forecast, DG ECFIN calculations.

A key underlying question is what could be taken as the 'new normal' for euro area medium-term growth. A more sanguine assumption than that presented in Table II.1 would have medium-term real growth in the range of 1.0-1.5%, where the upper end of the range could correspond to a scenario of substantial structural reforms. With inflation getting back over time to the ECB's target, this would lead to an estimate of the new normal for nominal growth at 3.0-3.5% for the euro area average. This is higher than the current growth of 2½ % of primary spending but not by much, especially if one considers the more prudent lower end of the range.

On the whole, although picking up moderately, public spending dynamics appear to remain under control in an historical perspective, particularly in France and Italy (in Spain, moderate growth in 2016 is expected to follow clear expansion in 2015). The major contributor to firmer expenditure is Germany, where discretionary spending is expected to rise by about 5% this year in nominal terms, boosted notably by refugee-related spending.

Prospectively analysing the fiscal stance

This sub-section turns to the prospective analysis of the fiscal stance with the example of the forthcoming budgets for 2017. Fiscal policy faces several objectives. At the macroeconomic level, those include long-term sustainability and short-term stabilisation, both from the national and the

euro area perspectives.⁽⁷³⁾ Evaluating the appropriate fiscal stance can rely on a balanced assessment of these two dimensions. Accordingly, the sustainability and stabilisation challenges can be captured summarily on a 'fiscal map' (Graph II.4). This should nevertheless be seen as a first pass, as other considerations beyond those portrayed on the fiscal map, such as monetary conditions, are relevant for evaluating the fiscal stance.⁽⁷⁴⁾ ⁽⁷⁵⁾

On the fiscal map, sustainability requirements are evaluated based on the so-called S1 indicator which is built around the 60% of GDP reference value of

⁽⁷³⁾ Musgrave (1959) classically describes three functions of fiscal policy: allocation, redistribution and stabilisation. Sustainability is strictly speaking more a constraint than an objective. The two macroeconomic dimensions of sustainability and stabilisation are highlighted in IMF (2013) and OECD (2015), among others. Musgrave, R. A. (1959), 'The Theory of Public Finance: A Study in Public Economy', McGraw-Hill, New York.

IMF (2013), 'Reassessing the role and modalities of fiscal policy in advanced economies', IMF Policy Paper, September.

OECD (2015), Fall F., D. Bloch, J.-M. Fournier and P. Hoeller, 'Prudent debt targets and fiscal frameworks', OECD Economic Policy Papers, No. 15.

⁽⁷⁴⁾ The twin consideration of sustainability and stabilisation for designing macro-fiscal policy is explored conceptually and empirically in Carnot (2014), which proposes a 'rule of thumb' weighing both objectives. In general terms, this approach is followed in DG ECFIN (2015) as well as in ECB (2016).

Carnot, N. (2014), 'Evaluating fiscal policy in EMU: A rule of thumb', European Economy, Economic Papers, No. 526.

DG ECFIN (2015), 'Report on Public Finances in EMU', European Economy, Institutional Papers, No. 14/2015.

ECB (2016), 'The euro area fiscal stance', ECB Economic Bulletin, Issue 4/2016.

⁽⁷⁵⁾ Another aspect that is relevant but not captured by the fiscal map relates to the fact that the effectiveness of fiscal easing for stabilisation purposes in countries with fiscal space also depends on the size of spill-over effects (some have argued that these are small; others have argued that these are larger especially at the ZLB).

government debt laid down in the Stability and Growth Pact.⁽⁷⁶⁾ The cyclical position is summarised by the projected output gap in 2017 under the assumption of a neutral fiscal policy in 2017. The resulting output gap thus combines information on the level of slack and the spontaneous growth momentum, irrespective of fiscal interventions.⁽⁷⁷⁾ These indicators should be seen as a first pass only, to be cross-checked by complementary indicators.

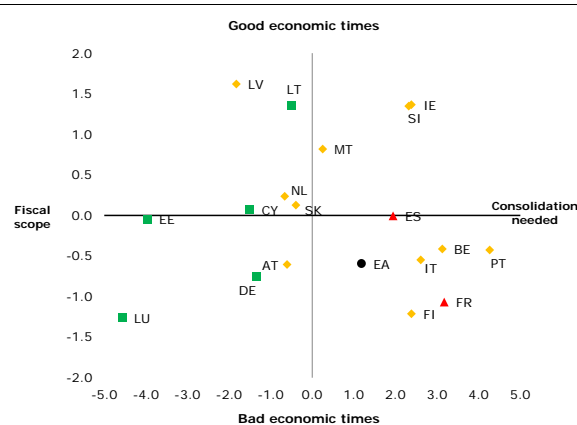
For the euro area as a whole, the fiscal map would point to a current trade-off between sustainability and stabilisation needs. The euro area appears to be located in the 'South-East quadrant' of the map where such a trade-off is at play. It reflects the maintenance, despite earlier consolidation, of a residual adjustment gap vis-à-vis a trajectory putting the debt on a firm downward path for the future, in conjunction with the persistence of a significant degree of economic slack, albeit a gradually narrowing one. This conclusion is qualitatively robust to the choice of alternative indicators to build the map, though precise magnitudes may differ.

A responsible fiscal policy needs to balance the two objectives of sustainability and stabilisation. There is a need to reduce existing levels of national debt and re-build fiscal buffers. A prudent approach to debt reduction in some euro area Member States would especially be warranted in order to be able to absorb the risk of new shocks. At the same time, the recovery remains slow and fragile with only a gradual decline in unemployment, while, as highlighted above, inflation remains persistently low. Moreover, the current account of the euro area is largely positive (at around 3½ % of GDP), suggesting room for expanding domestic demand relative to the global economy.

The fiscal map also highlights the marked differences between countries. First of all, the position of the euro area aggregate seems to be heavily influenced by France and Italy, two of the largest participating Member States. They both

appear to face important consolidation needs against the backdrop of significant cyclical slack. Spain is deemed to have still substantial consolidation needs while being close to neutrality in terms of the cycle. Nevertheless, the latter evaluation is, again and notably so for Spain, quite sensitive to the precise choice of the output gap estimate.

Graph II.4: Fiscal map: Sustainability and stabilisation challenges (1)
(2017, % of GDP)



(1) In this graph, sustainability needs (horizontal axis) are represented by the S1 indicator. A positive S1 indicates that consolidation is needed to ensure sustainability, while a negative S1 indicates that there is some scope for fiscal expansion without putting sustainability at risk. Stabilisation needs (vertical axis) are represented by the expected level for the output gap in 2017 assuming a neutral fiscal stance in 2017 (i.e. no change in the structural primary balance). A positive (negative) output gap denotes good (bad) economic times. When the output gap is not larger than +/- 0.5 % of GDP, it is considered to be broadly closed. The markers indicate the expected situation of each Member State under the SGP at the beginning of 2017: green squares = at or above MTO, orange diamonds = in the preventive arm not yet at MTO, red triangles = in the corrective arm.

Source: DG ECFIN calculations.

Meanwhile, a few Member States, most prominently Germany, would appear to have both a degree of fiscal scope (in the sense that their debt is low or being very rapidly reduced) and some stabilisation needs. Germany's stabilisation needs may be relatively modest, with both demand and potential output raised by the inflow of refugees.⁽⁷⁸⁾ This indicates a situation involving no

⁽⁷⁶⁾ The S1 indicator measures the change in the structural primary balance (SPB) required over the next 5 years to bring general government debt to the reference threshold of 60 % of GDP in 2030. See DG ECFIN (2016), Fiscal sustainability report 2015', European Economy, Institutional Papers, No. 18/2016.

⁽⁷⁷⁾ Technically, the output gap expected for 2017 in the Commission forecast is adjusted for the impact of the projected change in the structural primary balance multiplied by an assumed uniform fiscal multiplier of 0.8.

⁽⁷⁸⁾ A caveat also appears in order concerning the large fiscal scope identified by the S1 indicator for Luxembourg and Estonia, which derives from an assumption of convergence of public debt to 60% by 2030. The robustness analysis suggests that these countries do have fiscal scope, but arguably not to the extent suggested by S1. The impact of the refugee influx on German potential output is based on the assumption on how fast the refugees that have arrived mostly in 2015 will enter the labour market. Specifically, the impact on potential growth becomes more drawn out and lasts in 2017.

major trade-off from the economic perspective of the euro area as a whole, as the existing fiscal scope in Germany could be mobilised to support the economy, especially by investing in long-term growth notably by fostering investment.

At the same time, the fiscal map also indicates that the latest policy plans could be improved upon in some countries. In particular, plans that are tilted towards the stabilisation objective in large countries, including Italy, Spain and to a lesser extent France, could be rebalanced towards more consolidation.

II.4. Euro area policy mix at the zero lower bound— status quo and options

In spite of the many improvements to the governance framework ushered in by the post 2007-crisis, the elements governing the interaction of different macroeconomic policy instruments in the euro area still reflect the original Maastricht blueprint of the late 1980s and early 1990s. The blueprint was predicated on the prevailing understanding in mainstream macroeconomics at the time that policies should not be mixed. ⁽⁷⁹⁾ The implied division of labour is hardwired into the framework: in pursuing its price stability mandate the ECB also takes account of economic slack as one driver of inflation, thus taking care of common demand shocks in the euro area, while country-specific shocks are smoothed by automatic stabilisers the size of which mirrors national preferences for the degree of shock absorption.⁽⁸⁰⁾ In this system, there is in principle no need to coordinate macroeconomic policies, as long as respective mandates and rules are respected, namely the Stability and Growth Pact.

It is probably fair to say that when the Maastricht assignments were conceived with the objective of containing historic deficit and inflation biases, no one anticipated the type of macroeconomic predicaments the euro area is facing today. A situation where the monetary policy rate required to stabilise euro area inflation and would be

negative was not anticipated. Also, few expected economic developments to diverge so much across euro area countries, including the capacity to let automatic stabilisers play. The ZLB to conventional monetary policy making and the asymmetric nature of the fiscal rules ⁽⁸¹⁾ impose constraints on the current governance framework to deliver the appropriate policy mix.

The ECB, like other central banks in advanced economies, has deployed unconventional measures on a large scale. At the same time, fiscal policy is offering at best limited support, reflecting both its largely decentralised nature and the delicate trade-offs it is confronted with because the fiscal space has already been expanded in several Member States, and sustainability concerns kick-in, or it is not being used fully where available. ⁽⁸²⁾ As a result, aggregate demand remains sluggish, and inflation well below target, which, in turn, makes the adjustment of wages and prices in countries with adjustment needs much more difficult. The perceived limits on monetary policy are turning the attention to both structural reforms and fiscal policy. These may speed up the return towards more standard conditions and a normalisation of the monetary and financial environment.

Structural reforms are necessary to remove rigidities and to improve adjustment capacity of some euro area Member States. This is pressing also because productivity and potential growth in the euro area suffered significantly during the crisis. Structural reforms are not only needed in the resilience context but they play an important role in the policy mix. While many such reforms do not impact positively on aggregate demand in the short run, they generally boost growth in the medium and long run. ⁽⁸³⁾ Consequently, in the short-term there is an important role for fiscal policy, especially at the ZLB where the available evidence suggests higher fiscal multipliers ⁽⁸⁴⁾. One

⁽⁷⁹⁾ For a discussion see Dixit, A. and L. Lambertini (2001), 'Monetary and fiscal policy interactions and commitment versus discretion in a monetary union', *European Economic Review*, 45 (2001), pp. 977-987.

⁽⁸⁰⁾ The constraints imposed on discretionary fiscal policy are asymmetric: they essentially require countries to pursue discretionary fiscal adjustments until a sustainable position is reached, yet do not compel countries to use fiscal space if available.

⁽⁸¹⁾ They are prescriptive only as regards the reduction of structural deficits, not surpluses.

⁽⁸²⁾ Moreover, government investment expenditure, which has been constrained during the consolidation efforts in the post-crisis years, remains compressed, including in Member States with fiscal space, resulting in weaker short-term demand but also in lower medium-term supply and potential growth.

⁽⁸³⁾ This makes a case for a "careful prioritization and sequencing of reforms" in synchronization with cyclical conditions. See for example: Chapter 3 of the April 2016 IMF World Economic Outlook.

⁽⁸⁴⁾ Christiano et al. (2009) produced a seminal contribution on the subject.

promising approach is to strengthen the role of automatic stabilizers (that require no discretion) through the economic cycle. ⁽⁸⁵⁾ Another avenue that has already been pursued is to make the best use of the flexibility embedded in the EU fiscal rules. ⁽⁸⁶⁾ At the same time, it is important to recognize that in the absence of a fiscal stabilization function, there is no in-built mechanism at the EU level to deliver a fiscal stance which is appropriate for the euro area as a whole

while being balanced at Member States' level. ⁽⁸⁷⁾ This makes a case for procedures and instruments to manage the overall euro area fiscal stance as a logical counterpart of the common monetary policy. This avenue has been followed very recently by the Commission in its call for a positive fiscal stance for the euro area. ⁽⁸⁸⁾ The introduction of a common stabilisation capacity would also enable to manage shocks that cannot be absorbed by the national fiscal stabilisers on their own. ⁽⁸⁹⁾

Christiano, L, M. Eichenbaum, and S. Rebelo (2011), 'When Is the Government Spending Multiplier Large?', *Journal of Political Economy*, Vol. 119, No. 1, pp. 78 - 121.

See also In 't Veld, J. (2013), 'Fiscal consolidations and spillovers in the Euro area periphery and core', *European Economy Economic Papers*, No. 506, October 2013.

⁽⁸⁵⁾ See Buti, M. and V. Gaspar (2015), 'Designing fiscal policy for steady, enduring growth', *VoxEU*, 10th December 2015.

⁽⁸⁶⁾ See the Communication from the European Commission, http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/2015-01-13_communication_sgp_flexibility_guidelines_en.pdf

⁽⁸⁷⁾ For example, available empirical evidence suggests that not only increasing public investment by adjusting the composition of budgets in a neutral way is beneficial for growth, but also that debt-financed increase in government investment will have a positive spillover effect across the euro area, especially as monetary policy is constrained at the ZLB. See In 't Veld, J. (2016), 'Public investment stimulus in surplus countries and their euro area spillovers', *European Economy Economic Brief*, No. 16, August 2016 .

⁽⁸⁸⁾ Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Towards a positive fiscal stance for the euro area, 16.11. 2016. European Commission Staff Working document Report on the Euro Area concerning the Recommendation for a Council recommendation on the economic policy of the euro area, 22.11. 2016.

⁽⁸⁹⁾ See for instance: The VoxEU eBook on 'How to fix Europe's monetary union: Views of leading economists', <http://voxeu.org/content/how-fix-europe-s-monetary-union-views-leading-economists>; or the selected issues of the IMF Art. IV 2016 review of the euro area: <http://www.imf.org/external/pubs/ft/scr/2016/cr16220.pdf>.

III. Market liquidity: a cause for concern?

The issue of whether there has been a decline in market liquidity (the ease with which financial assets can be bought and sold without a large impact on price), and whether this is due to regulatory reforms introduced after the global financial crisis, has been one of the most hotly debated topics in finance in recent times. In the euro area, low market liquidity was thought to be one of the factors behind the volatility in some sovereign debt markets in the spring and summer of 2015 and there may be grounds for thinking that episodes of volatility will occur more frequently than in the past. This article shows that assessing whether market liquidity has declined across asset classes is difficult, in part because market liquidity is typically gauged according to various criteria which may not always point in the same direction. Neither is it easy to ascribe a clear role to regulation in driving any reduction in liquidity, as other important cyclical and structural factors have also been at play. Nevertheless, market liquidity matters enormously for well-functioning financial markets that can support the economy by allocating capital efficiently. As market structures are constantly evolving, it is essential that we deepen our understanding of developments in market liquidity, including by gathering more data and improving the analysis of recent liquidity dynamics. ⁽⁹⁰⁾

III.1. Introduction

One of the most hotly debated financial market issues in recent months has been whether the *market liquidity* of financial securities has declined in the wake of the global financial crisis (GFC) as a result of new regulatory reforms, such as the stricter capital and liquidity requirements imposed on financial institutions. Market liquidity may be broadly defined as the ability to trade securities in sufficiently large quantities, over sufficiently short periods, without a significant effect on their prices. If market liquidity has declined, this could impair efficient market functioning and thus limit the ability of financial markets to allocate capital efficiently and thereby support the real economy. Lower market liquidity may also contribute to financial market instability, especially as it is often associated with greater volatility in the prices of securities and greater spill-overs from one asset class to another.

This issue is especially important from the euro-area perspective, given that diminished market liquidity in some euro area government bond markets was a concern during the euro crisis. For example, Cœuré (2012) has noted that market liquidity in these markets ‘threatened to completely dry up’ at times. ⁽⁹¹⁾

Large fluctuations in liquidity in various financial markets are a key element of the uncertainty channel through which financial shocks can be transmitted to the real economy. These shocks can work through borrowers’ and lenders’ balance sheets and precautionary reductions in investment and consumption. The rise in uncertainty in the euro area during the GFC has been linked to the significant decline in investment there from the start of the crisis. ⁽⁹²⁾

From a financial market policy perspective, considerable attention is now being devoted to the topic of market liquidity in the EU. Adequate market liquidity is seen as essential for the EU’s objective of creating a Capital Markets Union (CMU), with the capacity to promote private risk-sharing in the euro area and beyond in support of growth and job creation, notably by promoting the development of corporate bond markets. ⁽⁹³⁾ In line with the CMU Action Plan, the Commission is reviewing the functioning of corporate bond markets, and has established an Expert Group to assess whether liquidity in these markets can be improved. And market liquidity was one of the main themes in the recent Call for Evidence exercise launched by the EU to assess whether legislation passed during the crisis is working as intended and is as ‘growth-friendly’ as possible.

⁽⁹⁰⁾ The section was prepared by Nigel Nagarajan, Adviser in the Commission’s Directorate-General for Financial Stability, Financial Services and Capital Markets Union (DG FISMA). It is based on the work of DG FISMA’s market liquidity project team.

⁽⁹¹⁾ Benoît Cœuré (2012), ‘Global liquidity and risk appetite: a re-interpretation of the recent crises’, speech at the BIS-ECB

workshop on global liquidity and its international repercussions, ECB (6 February 2012).

⁽⁹²⁾ For more details, see Balta, N. and B. Vašíček (2016), ‘Financial channels and economic activity in the euro area’, Quarterly Report on the Euro Area, Vol. 15, No 2.

⁽⁹³⁾ See more in Nikolov P. (2016), ‘Cross-border risk sharing after asymmetric shocks: evidence from the euro area and the United States’, Quarterly Report on the Euro Area, Vol. 15, No 2.

Low market liquidity has been cited as a contributing factor in several recent episodes of volatility in various securities markets, including:

(i) the summer 2013 ‘*taper tantrum*’, in which long-term US bond yields and the value of the dollar rose substantially following the US Federal Reserve’s announcement that it would begin to slow the pace of its asset purchases;

(ii) the ‘*flash rally*’ of 15 October 2014, in which US Treasuries experienced one of their largest intraday changes in yields in the past quarter century, in apparent response to only a moderately poor data release; and

(iii) the high volatility in some *euro-area sovereign bond markets* in the spring and early summer of 2015.

In relation to (iii), ECB President Mario Draghi referred to low market liquidity as a factor in the rise in several euro area government bond yields (including Bunds) in April and May 2015. He also suggested that we should ‘get used’ to periods of higher volatility.⁽⁹⁴⁾ It should be stressed that none of the above short-duration events had significant lasting impacts on either the financial system or the real economy.

For some commentators, these episodes nevertheless provide a foretaste of what may happen on a wider scale when global central banks eventually begin to unwind the highly accommodative monetary policies put in place in response to the crisis. For the ECB (2015), they ‘demonstrate [that] investor behaviour has become increasingly correlated, sentiment is fickle and market liquidity is prone to insufficiency during episodes of market tension’.⁽⁹⁵⁾ In line with this, the IMF (2015) has argued that benign cyclical conditions, notably investor risk appetite and macroeconomic and monetary conditions, could be masking underlying liquidity risks.⁽⁹⁶⁾ In other words, it is not just the *level* of market liquidity that matters, but also its *resilience*.

⁽⁹⁴⁾ See ECB press conference and Q&A of 3 June 2015; <http://www.ecb.europa.eu/press/pressconf/2015/html/is150603.en.html#qa>

⁽⁹⁵⁾ ECB (2015), ‘Financial stability review’, (November 2015), p. 48.

⁽⁹⁶⁾ IMF (2015), ‘Global financial stability report: vulnerabilities, legacies and policy challenges’ (October 2015).

A frequent complaint is that new regulations adopted in the wake of the financial crisis are to blame for the decline in market liquidity.⁽⁹⁷⁾ In particular, market participants and many commentators allege that the decline can be traced to factors such as higher capital and liquidity requirements that make it harder for banks to play their role as ‘market-makers’. Market participants have raised concerns that recent regulatory reforms may have reduced market liquidity *inter alia* by raising the cost to banks of warehousing assets (warehoused assets are bought in the secondary market and held for a period of time as inventories on the market-makers’ balance sheets). We will examine this claim below.⁽⁹⁸⁾

III.2. The dimensions of market liquidity

While it is easy to define market liquidity, measuring it is anything but. This is because liquidity is typically gauged according to several different criteria:

- *price* – to capture this aspect of liquidity, one can look at transaction costs, which are often proxied by the difference or ‘tightness’ between the buying price and the selling price (known as the bid-ask spread), or at the price impact of a trade (usually captured by measuring roundtrip trading costs);
- *immediacy* – this refers to the availability of speedy execution and settlement in the market;

⁽⁹⁷⁾ Perhaps most famously, Jamie Dimon (CEO of JPMorgan) warned in his April 2015 letter to JPMorgan shareholders that there is ‘far less liquidity in the general marketplace’ and assigned a key explanatory role for this to the impact of ‘myriad new regulations’. See ‘Jamie Dimon warns next crisis could see “more volatile” markets’, Financial Times (8 April 2015).

⁽⁹⁸⁾ Market-makers aim to fill client orders in one of two ways. In agency-based market-making, they match a buyer and a seller of an asset. If no match can readily be found, the market-maker will itself step in as buyer or seller – a practice known as principal-based market-making. This allows market-makers to provide ‘immediacy’ services to their clients, which supports market liquidity and price discovery.

The market-maker function has been particularly critical to the efficient functioning of certain secondary markets, such as that for corporate bonds, where it is often difficult to match buyers and sellers of the same bond at a given time, due to the high degree of heterogeneity of individual bond issuances. Specialised market-makers who can step in to absorb temporary order flow imbalances can therefore contribute to efficient market functioning. They can also act as shock absorbers during periods of market stress, which should help to dampen volatility.

- *market depth* – this is reflected in the number of orders above and below the price at which securities are traded;
- *market breadth* – this refers to the size of orders in the market; and
- *resilience* – i.e. the speed at which price fluctuations caused by trading abate, or at which imbalances in order flows are adjusted.

Not all of the above are directly measurable and they do not always send the same signals. For example, bid-ask spreads for many categories of securities are currently quite low by historical standards, suggesting that market liquidity may not be impaired at all, but other aspects of market liquidity, such as immediacy and market depth, appear to have declined. A weakness of the bid-ask spread as a measure of liquidity is that it is often derived from quoted, rather than actual, transactions and so may not reflect the actual costs of trades. Furthermore, low bid-ask spreads may be sending misleading signals about market liquidity, since they may rather be a reflection of the low interest rate environment and investors' consequent 'search for yield', or an indication that banks have scaled back their market-making activities and moved from a principal-based to an agency-based model, in which they require less compensation for the smaller amount of capital they devote to their inventories of securities. ⁽⁹⁹⁾

In the current environment, measures of market depth may tell us more than price-based measures, such as the bid-ask spread, about what is really happening to market liquidity. Market depth addresses the quantity-based dimension of market liquidity, i.e. the ease with which one can trade large numbers of securities. The interest in this aspect of market liquidity may be partly explained by the fact that, as market-making activity has declined, it has become more difficult and expensive to execute larger transactions. For dealer-intermediated markets, such as corporate bonds, there is evidence that the average size of large trades has fallen in recent years. So far, this reduction does not appear to be overly problematic – it does not give rise to higher liquidity premia. However, while smaller trade sizes may reduce dealers' exposure to risk, investors run the risk that

prices will move against them while the set of smaller transactions is still in the process of being completed. This could be detrimental to transactional efficiency, but the scale of this problem is not yet fully clear. Understanding better what is happening to the market depth dimension of liquidity is therefore of key importance.

III.3. Cyclical factors and market liquidity

In this section we consider three important cyclical factors that are likely to have affected market liquidity:

(i) *risk appetite* – market liquidity is thought to be strongly influenced by the willingness of investors to bear risk, but risk appetite is itself also dependent on market liquidity. If investors have easy access to liquid instruments that can be easily transformed into other securities without significant loss of value, they are likely to become more willing to take on risk. If market liquidity was under-priced in the run-up to the GFC, then the reduction in risk appetite in the immediate crisis period can be seen, at least partly, as a natural correction. Indeed, among market-makers there are grounds for thinking that the crisis may have given rise to a more fundamental reappraisal of risk tolerance. For example, one study links the shrinking of inventories on dealer banks' trading books to diminished risk appetite on the part of bank shareholders, who wish to see lower volatility in earnings. ⁽¹⁰⁰⁾ Still, the relative importance of risk appetite and other factors such as regulation in explaining market liquidity developments remains disputed. Looking at market volatility in US Treasuries associated with the 2013 'taper tantrum' event, there is evidence that dealers facing tighter balance sheet constraints before the sell-off did not reduce their net positions more than other dealers during the sell-off. This could be an indication that dealer behaviour was driven more by differences in risk appetite than by regulatory constraints on banks' market-making capacity. ⁽¹⁰¹⁾

(ii) *monetary policy* – this can affect market liquidity in various ways. Adrian and Shin (2008) show how banks manage their leverage pro-cyclically, increasing it during asset price booms

⁽⁹⁹⁾ PwC, 'Global financial markets liquidity study', August 2015.

⁽¹⁰⁰⁾ Committee on the Global Financial System, 'Fixed income market liquidity', CGFS Papers, No. 55 (January 2016), BIS.

⁽¹⁰¹⁾ T. Adrian, M. Fleming, O. Shachar and E. Vogt (2015), 'Has US corporate bond market liquidity deteriorated?', Liberty Street Economics, Federal Reserve Bank of New York.

and reducing it during busts,⁽¹⁰²⁾ primarily through collateralised borrowing and lending – in particular, repurchase agreements (repos) and reverse repurchase agreements (reverse repos), transactions in which the borrower of funds provides securities as collateral. This leads the authors to suggest that financial market liquidity can be thought of as synonymous with the growth rate of aggregate bank balance sheets. That growth reduces banks' funding constraints, making it easier for them to finance their inventories of securities, and thereby supports market liquidity. Indirectly, banks' greater funding liquidity (see below) also allows them to increase margin funding to traders or lending to other market-makers, with positive effects on the liquidity of securities markets. Low interest rates may support asset valuations and increase the value of collateral, which can also improve market liquidity. The above considerations are unambiguously positive for market liquidity. However, as global central banks' monetary policies have taken an increasingly 'unconventional' turn, through large-scale asset purchases ('quantitative easing') and forward guidance, the picture may be becoming more complicated. For example, quantitative easing is likely to improve market functioning and liquidity by increasing demand for the securities that the central bank purchases, thus reducing search frictions that prevent investors from finding potential counterparties and the downside risk of holding the targeted securities. However, some commentators worry that large-scale asset purchases may also lead to shortages of the securities in question, resulting in a potentially thinner market in the future. It has also been claimed that persistently low interest rates may distort investor behaviour. By reducing the return that investors can expect on safe assets, such a policy may encourage them to increase their exposure to riskier, less liquid assets and to crowd into trades. This may result in markets that trend strongly, but which are characterised by lower market liquidity and a vulnerability to sharp corrections.⁽¹⁰³⁾

(iii) *funding liquidity* – this refers to the ease with which banks and other financial intermediaries can settle their obligations with immediacy. While it is

conceptually distinct from market liquidity, the two concepts are closely related. The relationship has been explored extensively and margin requirements are now thought to play a key role in transmitting shocks from one type of liquidity to the other, since a dealer's margin requirements depend on the ease with which it can sell the securities it holds. For example, in a now well-known model, if banks and financial intermediaries suffer an initial shock to their funding (possibly triggered by a loss on their securities positions), they may reduce their trading activity, which, in turn, causes market liquidity to fall.⁽¹⁰⁴⁾ This makes lenders more nervous and they raise margin requirements, which further exacerbates financial intermediaries' funding problems. Similarly, Brunnermeier (2009) demonstrates how runs on financial institutions, such as that which occurred at Lehman Brothers, can cause a sudden erosion of bank capital that can also give rise to a negative feedback loop between funding and market liquidity.⁽¹⁰⁵⁾

The role of funding liquidity in explaining developments in market liquidity is potentially very important. The run-up to the GFC was characterised by banks' excessive reliance on short-term wholesale funding (used to finance longer-term assets) and by the opening-up of new avenues of funding, such as the 'originate to distribute' securitisation model. This funding pattern experienced significant dislocations during the GFC and banks have moved towards a greater reliance on longer-term and more stable funding sources, notably deposits. This seems to be at least partly due to market pressures and the realisation that wholesale funding was under-priced pre-crisis. In any event, these far-reaching changes in banks' funding patterns would have had significant implications for funding and market liquidity. Indeed, if wholesale funding was under-priced in the run-up to the crisis, it could be argued that 'excessive' funding liquidity was used to support a level of market liquidity that was ultimately unsustainable.

⁽¹⁰²⁾ Tobias A. and Hyun Song Shin (2008), 'Liquidity, monetary policy and financial cycles', Federal Reserve Bank of New York, Current issues in economics and finance, vol. 14(1).

⁽¹⁰³⁾ Matt King, 'The liquidity paradox', Citi research note (4 May 2015).

⁽¹⁰⁴⁾ Brunnermeier M. K. and L. H. Pedersen (2007), 'Market liquidity and funding liquidity', National Bureau of Economic Research, Working papers, No. 12939.

⁽¹⁰⁵⁾ Brunnermeier M. K. (2009), 'Deciphering the liquidity and credit crunch 2007-2008', Journal of Economic Perspectives 23(1).

III.4. Structural factors and market liquidity

This section examines three key structural factors that can be considered to have influenced market liquidity:

(i) *changes in banks' business models* – bank business models have undergone significant changes since the financial crisis. In particular, deleveraging (the downsizing and de-risking of bank balance sheets) has been a key theme for the banking sector and can be expected to have had important implications for market liquidity. As seen above, some researchers see aggregate growth in bank balance sheets as synonymous with market liquidity. Another important development is that retail banking has gained ground since the crisis, reversing a pre-crisis trend. This may partly reflect the fact that banks that focus more on commercial banking activities have lower costs and more stable profits than those more heavily involved in capital market activities, mainly trading.⁽¹⁰⁶⁾ It may be tempting to assume that the post-crisis changes in bank business models can be explained solely by reference to regulatory reforms, as the more stringent capital requirements under the Basel III accord would probably have resulted in banks considering changes to their balance sheet mix and perhaps prompted many to adopt de-risking strategies. On the other hand, de-risking, deleveraging and the relative rise of retail banking can also be seen as a way for banks to respond to their shareholders' desire for less volatile earnings in the wake of the crisis.⁽¹⁰⁷⁾ The decline in banks' trading activities since the crisis may therefore be, at least partly, a natural correction. Boot and Ratnovski (2012) argue that the deepening of financial markets in the 10 or so years preceding the financial crisis may have fundamentally destabilised banks by inducing them to use their franchise value to engage in risky trading activities at the expense of lending.⁽¹⁰⁸⁾ This over-reliance on trading may also have compromised their ability to act as liquidity providers during economic slowdowns.

(ii) *changes in market structure* – these may also have affected banks' ability to act as market-makers

by reducing their oligopolistic power and hence their ability to pass on to the market/counterparties the higher costs of holding large inventories of securities. The rise of the asset management industry is one such change. Asset managers and other non-bank players, such as pension funds and insurance companies, may lack some of the advantages of banks when it comes to acting as market-makers, e.g. banks' larger balance sheets, their combination of bundled services, their research capacities, etc. However, they may still be able to compensate partially for the reduction in market-making activity by banks through liquidity provision. Another structural factor worth emphasising is the increased concentration of bond holdings. This is examined in a recent study by BIS researchers which suggests that market liquidity may, as a result, increasingly come to depend on the portfolio allocation decisions of only a few large institutions.⁽¹⁰⁹⁾ In line with this, the IMF has found that bonds where ownership was more concentrated displayed less resilient market liquidity.⁽¹¹⁰⁾

(iii) *technological developments* – these have had huge implications for financial markets and have helped to reshape the whole trading process. For example, new trading protocols appear to have fostered innovation and increased competition among platform providers, which in turn have created efficiencies for many market participants.⁽¹¹¹⁾ In addition, technological change has allowed professional traders to develop electronic trading strategies (algorithmic or high-frequency trading). These use sophisticated computer programmes to generate, route and execute orders, and rely on extremely rapid transmission of orders to the trading platforms.⁽¹¹²⁾ At least for equity markets, there is evidence that algorithmic trading improves market liquidity by lowering adverse selection and decreasing the extent of price discovery associated with trading.⁽¹¹³⁾ Automation may also help

⁽¹⁰⁶⁾ Roengpitya R., N. Tarashev and K. Tsatsaronis, 'Bank business models', BIS quarterly review, BIS (December 2014).

⁽¹⁰⁷⁾ Committee on the Global Financial System, 'Fixed income market liquidity', CGFS Papers No. 5 (5 January 2016), BIS.

⁽¹⁰⁸⁾ Boot A. W.A. and L. Ratnovski, 'Banking and trading', IMF working paper, WP/12/238 (2012).

⁽¹⁰⁹⁾ I. Fender and U. Lewrick, 'Shifting tides – market liquidity and market-making in fixed income instruments', BIS quarterly review, BIS (March 2015).

⁽¹¹⁰⁾ IMF (October 2015), 'Global financial stability report: vulnerabilities, legacies and policy challenges'.

⁽¹¹¹⁾ See 'Electronic trading in fixed income markets', BIS (January 2016).

⁽¹¹²⁾ This discussion draws on Foucault T., M. Pagano and A. Röell (2013), 'Market liquidity – theory, evidence and policy', Oxford University Press, 37-44.

⁽¹¹³⁾ Hendershott T., C. M. Jones and A. J. Menkveld, 'Does algorithmic trading improve liquidity?', *The Journal of Finance*, Vol. 66(1), February 2011.

trading firms to manage inventory risk by allowing them to take a position in one market and hedge it almost instantaneously in another. However, the rise of algorithmic trading also gives rise to a number of issues. For example, it may lead to a reduction in average trade sizes (although this should not necessarily be taken as evidence of reduced market liquidity). Also, algorithmic traders tend to resemble one another, so their trades can often be highly correlated. Simultaneous movements into and out of specific securities may lead to sharp variations in liquidity supply and demand, thus increasing price volatility. Peaks in algorithmic trading activity in reaction to the same event may strain the capacity of trading systems and cause severe market disruption.⁽¹¹⁴⁾ Indeed, algorithmic trading was centrally implicated in the flash rally episode of extreme volatility in US Treasury securities in October 2014.⁽¹¹⁵⁾

III.5. Regulation in the spotlight

Since the crisis, regulators have taken important steps to strengthen the financial system, notably by enhancing *bank prudential requirements*, i.e. requiring banks to strengthen their balance sheets and improve the resilience of their funding models. Other key financial system reforms have been implemented, or are in the pipeline, include:

- *bank structural reform*, which attempts to address the systemic risk associated with the largest, most complex and interconnected financial institutions that engage in significant market-based trading, and notably the risks associated with 'proprietary trading' (e.g. the Volcker Rule in the US and the EU proposal for bank structural reform);
- the *leverage ratio*, which aims to complement the risk-based capital framework by restricting the build-up of leverage in the banking sector; and
- regulations aimed at improving *market infrastructure and transparency*, such as the Markets in Financial Instruments Directive II (MiFID II) and

⁽¹¹⁴⁾ Treasury Market Practices Group, 'Automated trading in treasury market and proposed best practice guidance', consultative white paper (April 2015).

⁽¹¹⁵⁾ US Department of the Treasury, Board of Governors of the Federal Reserve System, Federal Reserve Bank of New York, US Securities and Exchange Commission, US Commodity Futures Trading Commission, 'Joint staff report: the US treasury market on 15 October 2014' (13 July 2015).

the Markets in Financial Instruments Regulation (MiFIR).⁽¹¹⁶⁾

In principle, these reforms should help to protect the financial system, including by reducing the likelihood of banks and other financial institutions suffering liquidity crises or of such crises leading to contagion between institutions. We have seen in the context of bank prudential requirements that regulation may have been a factor making it more capital-intensive for market-makers to hold inventories of securities, which, in turn, seems to have reduced their capacity to use their balance sheet for market-making purposes. Many market commentators see this as a significant negative development as regards market liquidity.⁽¹¹⁷⁾ The response of policymakers to such claims has been quite interesting. For example, Carney (2015) concedes that 'while the core of the system has been made more resilient, the combination of new prudential requirements on dealers and structural changes in markets has reduced market depth and increased potential volatility'. Still, 'more expensive liquidity is a price well worth paying for making the core of the system more robust' and 'much of the pre-crisis market-making capacity among dealers was ephemeral'.⁽¹¹⁸⁾ A similar view has been taken by Fischer (2016), who argues that even regulatory changes 'that may have reduced market liquidity, likely have enhanced financial stability on balance'.⁽¹¹⁹⁾ In this view, the crisis clearly showed that risks were not efficiently priced in many parts of the financial system and that the regulatory reforms enacted after the crisis were needed to address this deficiency.

If pre-crisis liquidity levels were unsustainable, some sort of correction was always going to happen. Also, despite a wealth of studies on this topic, there remains a lack of clear evidence that singles out the role of regulation from the other factors at play. For example, the decline in banks' performance metrics since the crisis has been

⁽¹¹⁶⁾ Assessing the impact of these other reforms is beyond the scope of this short article.

⁽¹¹⁷⁾ See, for example, PWC, 'Global financial markets liquidity study' (August 2015).

⁽¹¹⁸⁾ See 'Building real markets for the good of the people', speech at the Lord Mayor's Banquet for Bankers and Merchants of the City of London at the Mansion House, London (10 June 2015); <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/821.aspx>

⁽¹¹⁹⁾ See 'Do we have a liquidity problem post-crisis?', remarks delivered at a conference sponsored by the Initiative on Business and Public Policy at the Brookings Institution, Washington, D.C. (15 November 2016);

shown to be widespread and not limited to those banks with significant trading activity.⁽¹²⁰⁾ Moreover, while most banks have reduced their stock of trading assets since the crisis, others have maintained or increased them. There is evidence that banks that had high risk-weighted capital ratios in 2009 and those that increased their capital ratios subsequently were more likely to increase their trading portfolios.⁽¹²¹⁾ In other words, it is by no means clear that the reduction in banks' market-making activity is due solely, or even mainly, to higher capital requirements as a result of post-crisis regulatory reforms. Still, it is appropriate that the exact role that regulation may have played as a factor shaping market liquidity should continue to be investigated, especially given the concerns that have been expressed about the possible decline in some dimensions of liquidity, such as market depth and resilience.

III.6. Conclusion

Market liquidity has been one of the most hotly debated financial topics in recent times. Market participants typically assign a key role to post-crisis regulatory reforms, but so far it has not been clearly established that there has been a general reduction in market liquidity across asset classes in the aftermath of the GFC. Price-based measures of market liquidity (notably bid-ask spreads) are generally very low for many securities. On the other hand, indicators of market depth, breadth and immediacy do appear to have declined.

At the same time, the role that regulation may have played in these developments has been difficult to pin down. A central concern related to regulation is that, since the height of the crisis, dealer banks seem to have less capacity to hold inventory on their balance sheets. There are grounds for thinking that this is related to the shift from principal-based to agency-based market-making, with dealers passing on risk more quickly, rather than warehousing it on their balance sheets. This shift would arguably have taken place anyway, but post-crisis reforms have also made it more capital-intensive for dealers to hold large inventories of securities. The reforms help to ensure that banks

are appropriately capitalised for the risks that they are taking and the core of the financial system is now safer as a result. However, policymakers need to stay mindful of the impact of reduced market-making capacity on overall market liquidity. In line with this, initiatives such as the EU's CMU Action Plan and the Call for Evidence demonstrate a willingness of policymakers to address concerns that have been raised about market liquidity, with a view to enhancing market functioning and ensuring that there is adequate funding to the wider economy.

As market structures continue to adapt, other liquidity providers may step into the gap created by the decline in dealer banks' activity. Indeed, this already seems to be happening to some extent. The trend whereby large asset managers are building up their internal trading teams and preparing to become price-setters, rather than just price-takers, is one example. Furthermore, moves towards more electronic and all-to-all trading, and other developments that facilitate greater and more efficient connectivity between buyers and sellers should mitigate some of the previous reliance on market-makers. The regulatory changes should also provide opportunities for more efficient market designs and structures to develop and evolve over time. There have recently been some signs of increased electronic trading, but given the current heterogeneity of many markets, particularly in corporate bonds, it seems that this probably has its limits. The question remains as to what extent, and where, market-making will be important in the future.

One key issue for further analysis will be the resilience of market liquidity in the transition to a new steady state. Even if it is not yet fully clear that market liquidity has actually declined across asset classes, there are genuine concerns about the systemic risks that could be triggered, followed by an adverse shock. If episodes of market illiquidity and heightened volatility are set to occur more frequently than in the past, policymakers must think about what this means and consider how to mitigate potential systemic risks. A related concern is that temporary factors may currently be masking an underlying lack of resilience of market liquidity. Perhaps most importantly, it is critical that policymakers understand better how the financial system will cope with the eventual normalisation of accommodating policies by global central banks.

⁽¹²⁰⁾ Roengpitya R., N. Tarashev and K. Tsatsaronis, 'Bank business models', BIS quarterly review, December 2014.

⁽¹²¹⁾ B. H. Cohen, 'How have banks adjusted to higher capital requirements?', BIS quarterly review September 2013; B. H. Cohen and M. Scatigna, 'Banks and capital requirements: channels of adjustment', BIS working papers, No. 443.

This section has shown that regulation has been only one of several factors influencing market liquidity in recent years. Other important cyclical and structural forces at play at more or less the same time have probably interacted with each other in complex ways and market participants are no doubt still adapting to them. Reaching definitive conclusions about the role of regulation is thus inherently difficult. Post-crisis regulatory reforms have strengthened the core of the financial system in the euro area and beyond, and improved the resilience of the banking sector. While some of

them may have had unintended consequences for market liquidity, this does not in itself suggest that they should be unwound. A key difficulty we face is that it is difficult to know what the ‘optimal’ level of liquidity is, in part because market structures are continually evolving. At the current juncture, the best strategy would be to deepen our understanding of developments in market liquidity, including by gathering more data and improving analysis of recent liquidity dynamics. Work is ongoing in the European Commission to do exactly that.

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