Box I.3: Automatic stabilisers in the euro area: a model-based assessment

This box examines the contribution of automatic fiscal stabilisers to the stabilisation of GDP in recent years. Understanding the role played by automatic stabilisers in the recent past holds important lessons for forecasters as it should allow them to better assess the impact of future shocks to the economy.

In the EMU, national fiscal policy plays a particularly relevant role as a stabilisation tool because monetary and exchange rate policies are decided in common at the euro area level. The issue has become even more crucial in recent years as the large shocks that hit the economy revived the discussion over how fiscal policy can support macroeconomic stabilisation by reducing macroeconomic volatility. [1]

A fundamental distinction needs to be made between discretionary fiscal policy and automatic stabilisers, whose relative merits have been widely discussed in the academic literature and policy debate. [2] Automatic stabilisation is provided by rules in the tax and transfer systems that contribute to smooth economic fluctuations and thus drive the budget balance to move with the cycle, with the amplitude of budgetary fluctuations dependent on the degree of stabilization provided. Revenue and outlays from different budget components, such as income, corporate and indirect taxes and unemployment benefits and social security contributions, vary during expansions and recessions helping to achieve output stabilisation. McKay and Reis (2016) distinguish several channels through which automatic stabilisers operate: a disposable income channel, stabilisation through marginal incentives, a redistribution channel and a social insurance channel. [3] On the other hand, the use of discretionary fiscal policy to manage short-term demand fluctuations has often been ineffective due to both a difficulty in providing a symmetrical adjustment in good times (it is politically more difficult to cut spending than to raise it) as well as its implementation lags (leading to pro-cyclicality) and impact on agents expectations. [4]

While automatic stabilisers have the advantage of not being subject to implementation lags, a key question is how effective they are in delivering output stabilisation, especially in the context of the budget restrictions such as those that accompanied the recent economic and financial crisis.

Estimates of the effectiveness of automatic stabilisers in the euro area vary considerably. Barrell and Pina (2004) estimate a degree of output smoothing from the presence of automatic stabilisers, measured as the root mean square deviation of GDP growth, of 11%, while Barrell, Hurst and Pina (2002) find a value of 9%. [5] Van den Noord (2000) finds, on average, a degree of smoothing effectiveness of between 25% and 30%, while in 't Veld, Larch and Vandeweyer (2013) estimate that automatic stabilisers smooth economic fluctuations by 13%-27%. [6]

Estimates for individual Member States are also wide-ranging. For example, Brunila, Buti and

(1) See, e.g,: Spilimbergo A., S. Symansky, O. Blanchard and C. Cottarelli (2009), "Fiscal Policy For The Crisis", CESifo Forum, Ifo Institute, vol. 10(2), pages 26-32. Corsetti G., ed. (2012), "Austerity: Too Much of a Good Thing? A VoxEU.org eCollection of views by leading economists", Centre for Economic Policy Research.

(2) See, for example: Hemming, R., M. Kell and S. Mahfouz (2002), "The Effectiveness of Fiscal Policy in Stimulating Economic Activity-A Review of the Literature", IMF Working Paper 02/208. Coenen, G., C. Erceg, C. Freedman, D. Furceri, M. Kumhof, R. Lalonde, D. Laxton, J. Linde, A. Mourougane, D. Muir, S. Mursula, C. de Resende, J. Roberts, W. Roeger, S. Snudden. M. Trabandt, J. in 't Veld (2012), "Effects of Fiscal Stimulus in Structural Models", *American Economic Journal: Macroeconomics*, Vol. 4, No. 1, pp. 22-68. Cogan, J., T. Cwik, J. Taylor and V. Wieland (2010), "New Keynesian versus Old Keynesian Government Spending Multipliers", *Journal of Economic Dynamics and Control*, Vol. 34, pp.281-95. Davig, T. and E. Leeper (2011), "Monetary-Fiscal Policy Interactions and Fiscal Stimulus", *European Economic Review*, Vol. 55, pp.211-227.

(3) McKay A. and R. Reis (2016), "The role of automatic stabilisers in the U.S. business cycle", Econometrica, pp. 141-194.

(4) IMF (2015), "Can fiscal policy stabilize output?", Fiscal Monitor April 2015. Blanchard, O., G. Dell'Ariccia and P. Mauro (2010), "Rethinking Macroeconomic Policy", *Journal of Money, Credit and Banking*, vol.42, pp. 199-215.

(5) Barrell, R., & Pina, A. (2004), "How Important are Automatic Stabilisers in Europe? A Stochastic Simulation Assessment", Economic Modelling, Elsevier, Vol. 21, No. 1: 1-35. Barrell, R., Hurst, I., & Pina, A. (2002), "Fiscal Targets, Automatic Stabilisers and Their Effects on Output", NIESR working paper.

(6) van den Noord, J. (2000), "The Size and Role of Automatic Fiscal Stabilisers in the 1990s and Beyond", OECD Economics Department Working Papers No. 230. in 't Veld, J., M. Larch and M. Vandeweyer (2013), "Automatic Fiscal Stabilisers: what they are and what they do", *Open Economies Review*, 24(1), p. 147-163.

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Box (continued)

in 't Veld (2003) find that, for a sample of EU countries, the smoothing capacity of automatic stabilisers is in the range of 20-30% in the case of a consumption shock, and 10-15% in the case of an investment shock. [7] Buti et al. (2002) find a value of 14% for Belgium and 22% for France, while Tödter and Scharnagl (2004) estimate a degree of stabilisation of up to 26% for Germany. Wijkander and Roeger (2002) calculate an index of stabilising efficiency of 0.24 for France and 0.36 for Germany. [8]

These variations across estimates partly reflect the nature of the shocks hitting the economy, but are to a large extent driven by the use of different benchmarks against which the effectiveness of automatic stabilisers is measured. Several studies use a benchmark where levels of revenue and expenditure are fixed in absolute terms, and variations of this approach have been used in the literature. [9] An alternative approach is to keep taxes and spending constant as a share of GDP. The choice of alternative benchmark budgets can lead to considerably different estimates of the degree of output smoothing provided by automatic stabilisers.

Importantly, the choice of the benchmark determines the narrative about the origin of automatic stabilisation. As clarified by in 't Veld, Larch and Vandeweyer (2013), if the neutral budget is defined as a budget where expenditure and revenues are fixed in levels, changes in the level of taxation and unemployment benefits are seen as automatically stabilising. Since unemployment benefits are relatively small, the bulk of stabilisation is associated with the revenue side of the budget. On the other hand, if the benchmark budget is defined as one where revenue and expenditure are constant as a share of GDP, automatic stabilisations mainly stem from progressive taxation and the size of government, notably from the fact that the bulk of government expenditure does not respond to cyclical fluctuations. [10]

This box uses the Commission's QUEST model to investigate the role played by automatic stabilisers in the euro area and in three large Member States over the period 2014-2016, following the approach adopted by in 't Veld, Larch and Vandeweyer (2013), who measure the effectiveness of automatic stabilisers against the two benchmarks discussed above. [11]

Design of the simulations

A first scenario replicates economic conditions prevailing in the euro area as an aggregate and in France, Italy and Spain in 2014, 2015 and 2016, assuming that automatic stabilisers are operating as normal. This is done by replicating the output gap profile (reported in Table 1) through a combination of shocks to consumption and equity risk premia which broadly mimics estimated consumption and investment gaps over the period. [12]

Table 1:
Output gaps (% of pot. GDP)

	2014	2015	2016
Euro Area	-2.6	-1.8	-1.2
France	-1.5	-1.4	-1.2
Italy	-4.2	-3.0	-1.9
Spain	-7.5	-4.6	-2.2

To assess the effectiveness of automatic stabilisers, in terms of the degree of output smoothing produced by the built-in budgetary elements, the outcome has to be compared to a situation where the automatic stabilisers are "switched off". In order to take into account the uncertainty surrounding the right benchmark to use, the scenario in which automatic stabilisers are operating as normal is compared to two alternative

(7) Brunila, A., M. Buti, and J. in't Veld (2003), "Fiscal Policy in Europe: How Effective are Automatic Stabilisers?", *Empirica*, Vol. 30: 1-24.

(8) Buti, M., C. Martinez-Mongay, K. Sekkat and P. van den Noord (2002), "Automatic Stabilisers and Market Flexibility in the EMU-Is there a trade-off?", OECD Economics Department Working Papers No. 335. Tödter, K., and M. Scharnagl (2004), "How effective are automatic stabilisers? Theory and empirical results for Germany and other OECD countries", *Deutsche Bundesbank Discussion Paper*, 21. Wijkander, H. and W. Roeger (2002), "Fiscal Policy in EMU: The Stabilization Aspect," in M. Buti, J. von Hagen, and C. Martinez- Mongay (eds), The Behaviour of Fiscal Authorities, Basingstoke: Palgrave, pp. 149–166.

(9) For example, Barrell et al. (2002), op. cit., fix taxes and spending at the level implied by their "structural rate", while Tödter and Scharnagl (2004), op. cit., use three different methods to keep the level of the budget balance fixed in the benchmark: exogenisation of the budget components, revenue compensation and expenditure compensation.

(10) A related example can be found in the comparison between the budgetary elasticity and the semi-elasticity. The first measures the change in revenue and expenditures level resulting from a marginal change in GDP. The later measures the reaction to a change in GDP of the ratios of expenditure and revenue to GDP.

(11) in 't Veld, J., M. Larch and M.Vandeweyer (2013), op. cit.

(12) Estimates of the output gap are from DG ECFIN's Spring Forecast. Consumption and investment gaps for the three years have been estimated using the HP filter.

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Box (continued)

benchmark models, reflecting the two definitions of a neutral budget applied in the literature on automatic stabilisers: expenditures and revenues fixed in levels and expenditures and revenues fixed as a ratio of GDP.

In the first benchmark scenario, expenditures and taxes are kept fixed at their baseline level. Government purchases and government investment are kept constant in real terms, while the level of unemployment benefits and other transfers to households are fixed in nominal terms. Changes in lump-sum taxes neutralise the cyclical components of tax revenues and unemployment benefits.

In the second benchmark scenario, expenditure and taxes are kept constant as a share of GDP. Government purchases, government investment and transfers are linked directly to GDP. In this scenario, lump-sum taxes change in order to keep the sum of tax revenues and unemployment benefits constant as a share of GDP.

Effectiveness of automatic stabilisers over the period 2014-2016

Tables 2 to 5 show the macroeconomic effects of the shocks in the three scenarios for the euro area as a whole and Italy, France and Spain. GDP effects are presented as deviations from the steady state, while the smoothing capacity of individual shocks is calculated as $1-\frac{\Delta GDP}{\Delta GDP_{benchmark}}$, to measure the degree of smoothing of GDP fluctuations provided by automatic stabilisers as compared to a neutral budget scenario.

The degree of smoothing provided by the automatic stabilisers differs depending on the benchmark budget against which the macroeconomic effects are compared. In the first benchmark budget scenario, euro area real GDP falls by 3.13% in 2014, i.e. about 20% more than in the case in which automatic stabilisers are operational. When the second benchmark budget is considered, the 2014 drop in GDP is 3.54%, about 36% larger than with automatic stabilisers. If the benchmark does not implicate inertia of government spending over the cycle (i.e. when the second benchmark is used), the degree of smoothing is larger (0.26 instead of 0.17), indicating that automatic stabilisation is not exclusively a result of the tax system, but is also affected by the size of government. Private consumption is most affected by the presence of automatic stabilisers, as stabilisation mainly operates through household disposable income. On the other hand, the effect on corporate investment is very small, as investment decisions in the model are determined by the net present value of investment projects over their whole lifetime.

Table 2:
Role of automatic stabilisers for different budgetary configurations-EA

Year		Percentage change			Percentage smoothing	
		Stabilisers on	Benchmark budget 1	Benchmark budget 2	Benchmark 1	Benchmark 2
2014	Real GDP	-2.61	-3.13	-3.54	0.17	0.26
2015	Real GDP	-1.80	-2.20	-2.53	0.18	0.29
2016	Real GDP	-1.21	-1.46	-1.69	0.17	0.29

Table 3:
Role of automatic stabilisers for different budgetary configurations-IT

Year		Percentage change			Percentage smoothing	
		Stabilisers on	Benchmark budget 1	Benchmark budget 2	Benchmark 1	Benchmark 2
2014	Real GDP	-4.19	-5.08	-5.69	0.18	0.26
2015	Real GDP	-2.99	-3.83	-4.27	0.22	0.30
2016	Real GDP	-1.91	-2.41	-2.62	0.21	0.27

Table 4:
Role of automatic stabilisers for different budgetary configurations-FR

Year		Percentage change			Percentage smoothing	
		Stabilisers on	Benchmark budget 1	Benchmark budget 2	Benchmark 1	Benchmark 2
2014	Real GDP	-1.50	-1.82	-2.02	0.18	0.26
2015	Real GDP	-1.38	-1.67	-1.86	0.17	0.26
2016	Real GDP	-1.20	-1.41	-1.55	0.15	0.23

Table 5:
Role of automatic stabilisers for different budgetary configurations-ES

Year		Percentage change			Percentage smoothing	
		Stabilisers on	Benchmark budget 1	Benchmark budget 2	Benchmark 1	Benchmark 2
2014	Real GDP	-7.48	-9.30	-10.39	0.20	0.28
2015	Real GDP	-4.60	-5.97	-6.77	0.23	0.32
2016	Real GDP	-2.20	-2.87	-3.19	0.24	0.31

Euro area effects in 2015 and 2016, although of smaller magnitude, are similar. This partly reflects the fact that the ratio between the consumption and investment gaps, and therefore the relative size of the consumption and risk premia shocks, is broadly unchanged over the time horizon considered.

In general, the capacity of automatic stabilisers to smooth economic fluctuations varies depending on the shock hitting the economy as well as on how the counterfactual budget is defined. Table 6 shows the effects on consumption and investment and the degree of smoothing provided by automatic stabilisers for a shock to consumption and a shock to equity risk premia in the euro area, both standardised to 1% of GDP.

Table 6:
Role of automatic stabilisers for different shocks and budgetary configurations-EA

	Percentage change			Percentage smoothing	
	Real GDP	Benchmark 1	Benchmark 2	Benchmark 1	Benchmark 2
Shock to consumption	-1.00	-1.23	-1.40	0.19	0.29
Risk premia shocks	-1.00	-1.14	-1.26	0.12	0.21

As could be expected, the effects on consumption and GDP are considerably different. More interestingly, the degree of smoothing offered by automatic stabilisers is remarkably larger in the case of a consumption shock, consistent with

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Box (continued)

findings from Brunila et al. (2003) and Tödter and Scharnagl (2004). [13] In the case of a consumption shock, automatic stabilisers dampen the drop in euro area GDP by 19% compared to a benchmark budget with fixed levels of revenues and expenditure. The degree of smoothing increases to 29% when using a benchmark where revenues and expenditure follow GDP. The smoothing capacity of automatic stabilisers, however, is reduced to 12% and 21% when risk premia shocks are considered. This is largely explained by the fact that, as mentioned above, automatic stabilisers mostly affect disposable income and consumption.

Variations across Member States are explained by differences in tax and transfer systems and by the composition of the shocks hitting the economy. The degree of labour tax progressivity is an important factor affecting the smoothing capacity of automatic stabilisers. The results show a higher degree of output stabilisation in countries with more progressive labour tax systems, such as Spain and Italy. However, in the case of Italy, where the investment gap relative to the consumption gap was larger over the period considered, the estimated effect of automatic stabilisers is smaller. The estimated effectiveness of automatic stabilisers is lowest in the case of France, where the income tax system is less progressive and where the investment gap was relatively large in comparison to the consumption gap.

Overall, these results show that, in recent years, automatic stabilisers played a non-negligible role in stabilising the economy in the euro area as a whole and in a number of Member States. The effectiveness of automatic stabilisers in dampening output fluctuations was larger in countries where the negative GDP effects were more consumption-driven and where the income tax system was relatively more progressive.

[13] Op. cit.