The Euro area, between self-inflicted misfortunes and hopes

iAGS (OFCE, ECLM, IMK)[1]

Abstract

The paper's key message about fiscal consolidation is that that a backloaded consolidation would have been a superior strategy to a frontloaded one, as the real costs of consolidation would have been minimized and debt convergence at a 20-year horizon achieved. The paper also evaluates the extent of real exchange rate misalignments within the Euro area, and discusses a structural reform consisting in a coordinated minimum wage policy in the Euro area. Another policy alternative to fiscal consolidation would be to "green" the economy via a sharp and immediate carbon-tax policy complemented with a fiscal impulse. The paper gives an assessment of the impact of such an alternative.

1. Introduction

The global financial crisis has given rise to a revival of Keynesian-like fiscal policies which, for two main reasons, has been short-lived in the Euro area. Indeed, after a recession in 2009, most governments reversed the fiscal stance and entered into a period of fiscal consolidation. First, the requirement to reduce public deficit and to comply with the 3%-of-GDP rule is enshrined in the Stability and Growth Pact. Fiscal rules have even become more stringent after the adoption of the Treaty on stability, coordination and governance. Second, the outbreak of the Greek crisis in late 2009 created fears of a possible sovereign default and contagion among Euro area member states. Both reasons contributed to fiscal frontloading and sharp cuts in public expenditures.

It has been obvious that substantial domestic austerity measures, like in Greece, coupled with a synchronized wave of fiscal consolidation in the Euro area since 2011 have had a strong negative impact on growth that paved the way for a double-dip recession. The fact that fiscal consolidation has been implemented though the output gap had not yet recovered from the recession has made the former more costly and potentially self-defeating. National governments have been confronted with a dilemma: they have had to achieve sustainability of public debt but they also have had to avoid stifling the nascent recovery. This trade-off between reducing debt and supporting activity depends critically on the value of the fiscal multipliers. The former consensus among mainstream economists – before the Great Recession – considered that fiscal multipliers were weak and that fiscal policy had temporary effects if any. Since the Great Recession, a new consensus emerged: fiscal multipliers are time-varying and they are high in time of crisis.

The Euro area consolidation process has thus raised a few issues. The most frequent one has dealt with its *real* macro costs and with its ability to improve or achieve debt sustainability. The second issue relates to the coordination of structural reforms with fiscal consolidation, in order to tame macro imbalances in the Euro area which intensified the core-periphery divergence and were at the

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roots of the Euro area crisis. The third issue is that of alternative strategies to escape the current crises.

To investigate these issues, we draw on a reduced-form model of 11 Euro area countries (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain). The model is sufficiently detailed to explicitly link all macro elements of debt sustainability and output dynamics, the composition effects and the external trade linkages. The model also includes time-varying fiscal multipliers in a dynamic macroeconomic model. It is important to acknowledge that debates continue about the value of multipliers, the evaluation of recent output gaps, and hysteresis effects. For these reasons, the choice of a reduced-form model makes it possible, after some changes in the parameters, to conduct a large array of sensitivity tests. The international dimension of the model enables to investigate the consequences of fiscal consolidation on competitiveness and current account (im)balances between Euro area member states.

2. From austerity to deflation

Expansionary fiscal policies undertaken in 2009, when the world economy was strongly hit by the worst financial crisis since the Great Depression, have been short-lived. EMU countries have indeed clearly engaged in a consolidation of fiscal policies since 2011. The objectives were twofold. In the short run, governments aimed at bringing back the deficit ratio to 3% of GDP, as recommended by the Stability and Growth Pact (SGP). In the long run, in accordance with the new fiscal rules embedded in the revised SGP or the Fiscal compact, the objective is to reach a debt ratio of a least 60% of GDP by 2032. For the advocates of such a frontloaded strategy, consolidation was needed to restore credibility of fiscal policies and to reduce long-term interest rates. The success of such a strategy has not yet materialized. Credibility has not improved despite consolidation measures taken in crisis countries in 2010, 2011 or 2013. Spreads increased in 2011 and 2012 and reversed only after Mario Draghi, the President of the ECB, pronounced the famous sentence "Within our mandate, the ECB is ready to do whatever it takes to preserve the euro". Actually, austerity measures were panic-driven (De Grauwe and Yi, 2013) as the sovereign debt crisis has urged national governments to deal with the sustainability of public finances. The outbreak of the crisis was more related to institutional problems than to an excess of public debt (De Grauwe, 2012). But, the choice of austerity was costly. By the end of 2014, Euro area GDP is still below its pre-crisis level. The Euro area went into a double dip recession after the GDP decreased anew in 2012 and 2013. Deflation is looming, if not already there, and may have been reinforced by the new macroeconomic imbalances procedures. Coping with public debt and current account imbalances is certainly needed but so far, the European strategy has been ill-designed.

a. Self-Defeating austerity

Austerity measures were not only imposed by European fiscal rules but also resulted from the former consensus according to which fiscal policy had only weak effect on activity[2]. Fiscal multipliers were supposed to be low and (i.e. below unity) and some empirical papers even argued that expansionary

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[2] See Asslop and Vines (2005) for a detailed discussion.

fiscal consolidation might occur when fiscal restriction was mainly based on expenditures cuts rather than on tax increases (Alesina and Perotti, 1996, Perotti 1996 or Afonso, 2010)[3]. Besides, until recently, the economic models used by the European Commission relied on the Ricardian equivalence hypothesis assigning only a minor role to fiscal policy. These views have yet been challenged. Resorting to a narrative approach, IMF (2010) found multipliers significantly above unity, notably when monetary policy was at the zero lower bound and when fiscal austerity measures are synchronized. Having values above unity indicates clearly that fiscal consolidation is costly. Finally, an abundant literature has recently discussed not only the value but also the stability of fiscal multipliers. Blanchard and Leigh (2013) also found that fiscal multipliers have been underestimated during the financial crisis. As a consequence, a gradual and smooth fiscal consolidation process is certainly preferable to a strategy of fast and sharp reduction of public imbalances. The size of the fiscal multiplier over the business cycle appears a crucial issue in the current context.

To judge the interactions between debt and output gap dynamics, Blot et al. (2014a,b,c) develop a simple reduced-form model representing eleven countries of the euro area (Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain). The full description of the model goes beyond the scope of this paper. According to the debt rule incorporated in the revised SGP and in the Fiscal Compact, the gap between current public debt and the 60 % target should be narrowed by 1/20th each year. Blot et al. (2014b,c) show that actual path of fiscal consolidation has unambiguously been costly. It would notably have triggered a sharp fall in demand delaying the recovery. Countries would not fully exit from the crisis until 2019 (Austria, Finland), 2020 (Germany, France, Italy, Spain, Portugal) or 2021 (Greece). Regarding the reduction of debt-to-GDP ratios, the simulations suggest that not all euro area countries would be able to reach the 60% threshold, but debt ratios would be substantially lowered. For instance, Greece would halve its debt ratio and Ireland's debt would decrease by 35 percentage points of GDP between 2017 and 2032. Nevertheless, the social costs as well as the cost in terms of fiscal balance could make this adjustment unrealistic. Christodoulakis (2013) shows how much fiscal austerity in Greece has been self-defeating. For Greece, Italy, Portugal and Belgium, austerity measures planned would indeed require structural primary surpluses above 3% of GDP for many years, which has rarely been achieved in history of fiscal consolidation.

Blot et al. (2014b and 2014c) seek for alternative strategies, aiming at reducing public debt but at lower cost. Considering the case where countries implement a maximum yearly adjustment that would not exceed 0.5 point of GDP, they find that the average growth for the euro area as a whole on the 2013-2017 period would be 0.6 point higher. All countries but Ireland would reach the 60 % debt-to-GDP ratio. This strategy is clearly more efficient as a larger share of the fiscal contraction would occur after the output gap has recovered, that is when the fiscal multiplier is lower. Cumulated fiscal stance would be less restrictive without reducing the ability of countries to comply with the debt rule. The same would hold when austerity is delayed. In this scenario, consolidation would start when the ouptgap is closed[4]. Yet, the difference, in terms of growth for the euro area, between the two scenarios of spreading and delaying is relatively weak.

Then, it seems that frontloading austerity was not the best strategy. It has triggered significant cost with only weak results in terms of debt reduction. Here we claim that an alternative strategy would

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[3] This view was however debated notably by, e.g., Creel *et al.* (2005).
[4] See Blot et al. (2014c) for the details of the algorithm.

have been less painful. Besides, spreading austerity would not breach the fiscal rules. Article 3 of Council regulation 1177/2011, states that: "*in its recommendation, the Council shall request that the Member State achieve annual budgetary targets which, on the basis of the forecast underpinning the recommendation, are consistent with a minimum annual improvement of at least 0.5 % of GDP as a benchmark, in its cyclically adjusted balance net of one-off and temporary measures, in order to ensure the correction of the excessive deficit within the deadline set in the recommendation*".

Furthermore, we also claim that due to the economic situation at the euro area level, a fiscal stimulus is needed. It would help to exit the crisis and close the ouput gap. In the long run, it would also sustain growth. We present thereafter a plan for investment, which focuses on the need to promote the transition toward a low carbon economy.

b. The hazardous way to cope with current accout imbalances

The euro area crisis does not boil down to a sovereign debt crisis[5]. During the pre-crisis period macroeconomic imbalances, specifically current account imbalances steadily increased. These imbalances — which were largely, but not solely, within-area imbalances — implied an accelerating increase in the foreign indebtedness of the deficit counties and a corresponding rise in the net foreign asset position of the surplus countries. The increasing gap was financed by a growing flow of private capital to the current account deficit economies from the surplus countries (Chen, Milesi-Ferreti and Tressel, 2013). In the pre-crisis period the importance of macroeconomic imbalances was largely ignored or, indeed, denied. The relative lack of interest about macro imbalances in the Euro area was initially related to the perceived disappearance of the external constraint for countries sharing the same currency. As stated by Giavazzi and Spaventa (2010), it was thought that a common currency would prevent from speculative attacks. Making a parallel with the relationships between regions and country, where no one generally cares about regional trade imbalances within a country, it was believed that the external constraint would be managed at the monetary union, not domestic, level. Moreover, higher trade deficits in peripheral countries were considered parts of the catching up process in these countries where new public and private investments were required. A kind of benign neglect attitude towards twin deficits thus arose (see, e.g. Blanchard and Giavazzi, 2002; Ahearne et al., 2007). This view has turned wrong when, both the ability and willingness of economic agents in the deficit countries to keep on borrowing and, more importantly, the willingness of private sector agents in the surplus countries to prolong existing credit and hold government bonds of deficit countries quickly dried up. The gap was partly filled by various forms of public lending and the monetary refinancing operations of the ECB. A rebalancing of the euro area economy and a narrowing, if not a reversal, of current account imbalances is a necessary condition for a re-emergence of a stable growth model in the euro area.

Some progress has been made in narrowing current account imbalances though (Figure 1), particularly in the bilateral intra-EMU trade balances, but the correction is far from complete and has been uneven.

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[5] See Shambaugh (2012) for an extended discussion on the multiple dimension of the Euro area crisis.

Figure 1. Current account imbalances in the euro aera
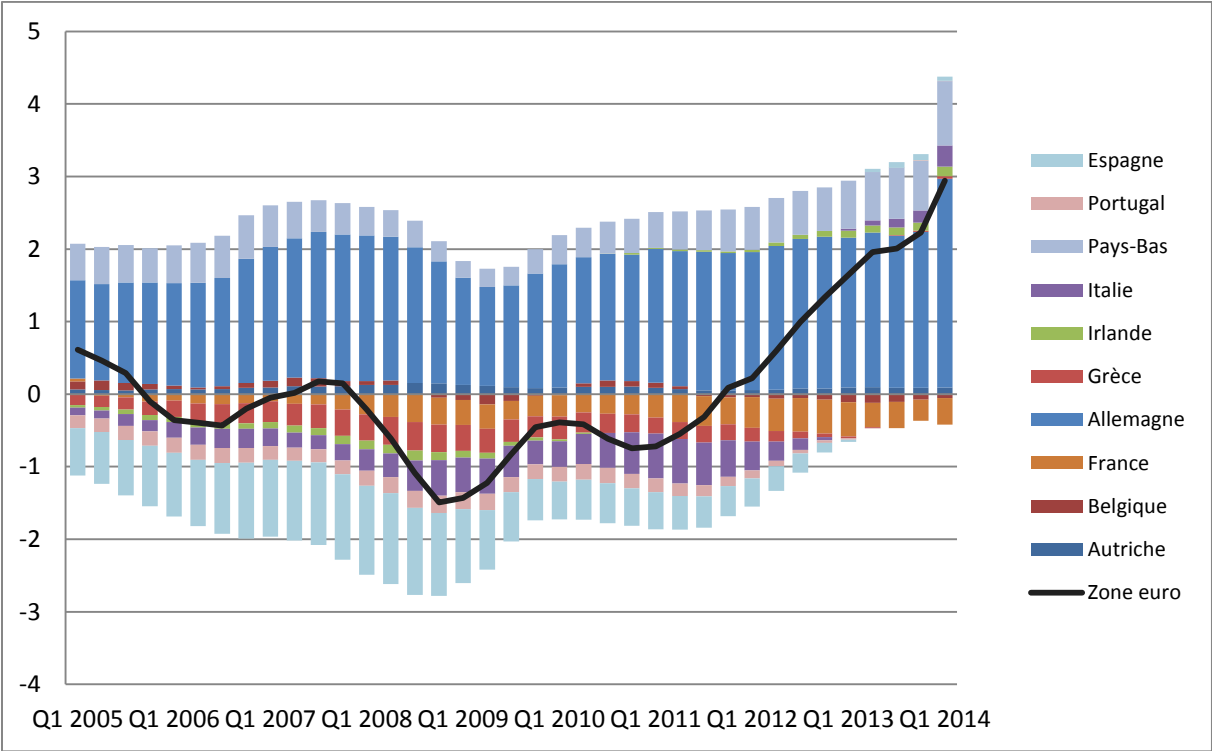
Source: Eurostat

The correction of external imbalances realized so far has been mainly one-sided since it has hinged disproportionately on the deficit countries. There was indeed a very sharp contraction of deficits when the crisis hit, as households and firms in the deficit countries faced restricted access to funding or were otherwise (via bankruptcy or unemployment) forced to reduce consumption, investment and borrowing. The downward adjustment of the surpluses was much smaller and, above all, temporary: already in 2010 they began increasing once more, driven particularly by developments in the Netherlands and Germany. As a consequence, the overall current account position of the euro area moved sharply into surplus. This is a major change, as the euro area current account had been close to balance since the common currency's inception in 1999. Besides, the bulk of the adjustment has been associated to a demand shortfall meaning that rebalancing has occurred at far lower levels of aggregate output and employment with negative knock-on effects on fiscal consolidation. Finally, the fall in domestic demand has put downward pressure on nominal wages and prices, restoring competitiveness but also fueling deflation risk.

These deflationary policies are strongly enshrined in the European governance. The need to achieve the 3 % deficit ceiling has constrained countries to consolidate fiscal policies. The negative demand shock not only reduced demand and imports but it also contributed to a slow down of wage growth. Had it been more symmetric, with surplus countries running fiscal expansion, such a strategy might have been seen as a correction mechanism of intra-imbalances. Actually, the global stance of fiscal policy was restrictive in the Euro area since 2010, creating a deflation bias. This bias has even been reinforced with the adoption of the "6-pack" in December 2011. The new rule adds to the preventive and corrective tools of the Stability and Growth Pact a Macro Imbalance Procedure (MIP) drawing on

indicators pertaining to current account positions, competitiveness, and financial stability. The envisaged purpose is "to establish a surveillance procedure to prevent and correct macroeconomic imbalances" and "to provide an early-warning signalling of potentially harmful macroeconomic imbalances in MS". The surveillance is based implicitly on a 2-step procedure. First, the scoreboard provides a "reliable signalling device for potential harmful imbalances". Then it is followed by an "economic reading" taking into account country specific circumstances and institutions. This second step implicitly relies on an in-depth analysis to assess precisely whether or not the signalled disequilibria may challenge future prospects for growth, price and financial stability. In-depth analyses are then published by the European Commission and they may give rise to economic policy recommendations to address macroeconomic imbalances.

Though the list of indicators (table 1) fits well in the purpose of signalling macro imbalances, it may put too much emphasis on the respect of numerical thresholds which might lead to fallacious recommendations. Second, part of the assessment relies on an asymmetric view of imbalances. For instance, the threshold for current account imbalances is set between a surplus of 6% of GDP and a deficit of 4% of GDP. There is no economic rationale for that numbers in particular; and there is no economic rationale as well for introducing an asymmetry in the current account threshold. What makes a deficit above 4% more dangerous to the stability of the Euro area than a surplus above 4% (but below 6%)? It seems difficult to argue that German current account surpluses, above 4 %, are more innocuous to the Euro area than a deficit above 4% in a small country like Greece. The reverse is certainly more correct. Other indicators relating to competitiveness and market shares are even more asymmetric since the burden of responsibility is exclusively borne by deficit/debtor countries. This is notably the case for the net international investment position which is, by construction, the accumulation of past current account balances. Because of this bias in signalling only a certain type of imbalances, it is possible to miss the fact that a market share loss by a given Euro area country may have as counterpart a market share gain by another one. Therefore, there is a risk that recommendations will be geared toward deficit countries urging them to adjust wage costs downward or to implement restrictive policies. Conversely it will fail to signal that surplus countries have run competitive disinflation policies. As stressed by De Grauwe (2012), the current governance of macroeconomic imbalances in the Euro area endorses the "tyranny" of creditor countries. The result will be that the Euro area as a whole will continue to implement a global deflationary policy. By only signalling competitiveness losses, the MIP will actually miss to signal a coordination problem among Euro area countries.

Policies which have been advocated so far to peripheral countries and which have been implemented by them left no room to interpretation (see tables 2 and 3). The main EC recommendations to improve competitiveness are: decentralisation of wage bargaining at firm-level, limitation of the extension of collective bargaining, reform of the level or the procedure to set the minimum wage. The idea is to facilitate a downward adjustment of wages in a context of widespread unemployment, i.e. to improve the market-based adjustment of wages. The two boxes below present the main reforms recently approved concerning wage-setting (Schulten and Müller, 2013). These recommendantions undoubtedly reveal a bias in the diagnosis of the current crisis. The bulk of macro balance rests on the countries facing a deficit, not a surplus. Wages in the public sector have often been reduced and minimum wage has been frozen. In Greece, it has even been cut. Besides, automatic extensions of collective agreements have often been suspended and opt out clauses have

been granted[6]. These reforms were often supported or proposed in MIP reports by the European Commission. In-depth analyses have indeed pointed out the need to restore competitiveness in crises countries and notably in Spain, Portugal or Greece.

Table 1. Indicators and thresholds of MIP

Label	Threshold Geo Area	Threshold Lower Value	Threshold Upper Value
3 year average of Current Account balance as % of GDP	EU27	-4	6
Net International Investment Position a % of GDP	EU27	-35	
% change (3 years) of Real Effective Exchange Rates (42 IC) with HICP deflators	EA	-5	5
% change (3 years) of Real Effective Exchange Rates (42 IC) with HICP deflators	Non EA	-11	11
% change (5 years) in Export Market Shares	EU27	-6	
% change (3 years) in Nominal ULC	EA		9
% change (3 years) in Nominal ULC	Non EA		12
% y-o-y change in Deflated House Prices	EU27		6
Private Sector Credit Flow as % of GDP – consolidated	EU27		14
General Government Debt as % of GDP	EU27		60
3 year average of Unemployment Rate	EU27		10
% y-o-y change in Total Financial Sector Liabilities	EU27		16.5

Source: European Commission, Economic and Financial Affairs

Table 2. Interventions of the EC in wage policies in 2011-2012

Recommendations/agreements:	Addressed countries:
1. Country-specific recommendations in the framework of the European Semester:	
Decentralisation of collective bargaining	Belgium, Italy, Spain
Reform/abolition of automatic wage indexation	Belgium, Cyprus, Luxembourg, Malta
Moderation of minimum wages developments	France, Slovenia
Moderation of general wage developments	Bulgaria, Finland, Italy, Slovenia
Wage developments in line with productivity growth	Germany
Addressing high wages at the lower end of the wage scale	Sweden
2. Country-specific agreements between EU-ECB-IMF or IMF and national governments within the framework of "Memorandum of understanding":	
Decentralisation of collective bargaining	Greece, Portugal, Romania
More restrictive criteria for extension of collective agreements	Greece, Portugal, Romania
Reduction/Freeze of minimum wages	Greece, Ireland, Latvia, Portugal, Romania
Reduction/Freeze of public sector wages	Greece, Hungary, Ireland, Latvia, Portugal, Romania

Source: Schulten and Müller (2013).

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[6] See Blanchard et al., 2013, or IMF, 2012, for a list of the structural reforms adopted by crises countries.

Table 3. Decentralization of collective bargaining in countries under surveillance

Measures:	Affected countries
Abolition/termination of national collective agreements	Ireland, Romania
Facilitating derogation of firm-level agreements from sectoral agreements or legislative (minimum) provisions	Greece, Portugal, Hungary, Italy, Spain
General priority of company agreements/ abolition of the favourability principle	Greece, Spain
More restrictive criteria for extension of collective agreements	Greece, Portugal, Romania
Reduction of the 'after-effect' of expired collective agreements	Greece, Spain
Possibilities to conclude company agreements by non-union group of employees	Greece, Hungary, Portugal, Romania, Spain

Source: Schulten and Müller (2013).

In a context of austerity amplified by reforms in labour market, the current process of disinflation/deflation is not under control and risks creating a long lasting deflation (see the simulations below). Cost competitiveness will improve, current account deficits may turn to surpluses but the adjustment might overshoot.

Jointly with the Stability and Growth Pact, the asymmetry in the 6-pack indicators is responsible for the low-growth and low-inflation bias in the management of the European sovereign crisis. There is a need for an alternative adjustment to reduce public debt and to cope with external imbalances. Fiscal consolidation should not be frontloaded. Considering that unemployment rate remains at record level, the stance of fiscal policy should be expansionary at the euro area level. To this end, we propose hereafter an investment strategy oriented toward a low carbon economy. Concerning current account imbalances, the adjustment is needed but it should be more symmetric and based on coordination to avoid a deflation bias.

3. **The need for a symmetric and coordinated wage adjustment**

   a. *Estimating the competitiveness gap*

In order to estimate the competitiveness gap, we first define adjustment targets for each euro area countries. To do so we take into account the fact that economies have not yet recovered from the crisis. The external disequilibrium of a country can be assessed by computing the gap between the structural trade balance (the trade balance obtained when output gaps are closed, STB thereafter, see Appendix 1 for computation details) and the trade balance that stabilizes the net international investment position (NIIP thereafter) at a desired level expressed as a % of GDP. The structural trade balance of a country depends on the output gap of the economy: a negative output gap signals a weak internal demand that diminishes imports. Closing the output gap would then worsen the trade

balance of that country. The structural trade balance also depends on the output gaps of trade partners: if they face a negative output gap, they import less from the country. Closing their output gap would then deteriorate the trade balance of the country.

In Table 2, we report the STB for eleven EA countries. STB are generally lower than current trade balances, since almost all EA countries face a more negative output gap than that of their partners. Greece, the most extreme case, has an actual trade balance near to -0.2 % of GDP in 2013, but its STB amounts to -11.4% of GDP due to its strongly negative output gap (-13.3% of GDP). On the contrary, Germany has a STB (8.3% of GDP) higher than its trade balance (6.2% of GDP) in 2013, since its output gap is nearly closed while the one of its main trading partners is on average larger. We also report the STB target, i.e. the STB compatible with a stable NIIP. It is computed as the current NIIP adjusted by the gap between the potential growth rate and the long run real interest rate, and corrected for the gap between the current account and the trade balance. Defining the target of the external adjustment of EA countries is a critical task. It is clear that an ever increasing or decreasing external position is not sustainable in the long run. Stabilizing the NIIP is therefore a necessary condition, but the level at which that position becomes unsustainable is not clearly quantified in the literature. In this part, for the sake of simplicity we stabilise the NIIP in the long run at its current level.

STB targets are generally positive. This is due to three points. First a positive and stable NIIP needs a positive STB insofar as the gap between the potential growth rate and the real interest rate is positive. Second, a higher real interest rate than the potential growth rate implies NIIP and STB with reverse signs, which is the case for Italy here. Third, the gap between the current account and the trade balance (revenues and current transfers in % of GDP) is assumed to be constant in the long run and has then to be compensated by a higher or lower STB. This latest point is for instance very important for Ireland. We now analyse more carefully the gap between the STB and its target. Results show that situations differ from one country to another. Some countries need to strongly increase their STB to achieve the target. This is the case when the last column of Table 4 reports a positive TB gap. It concerns first and foremost Greece: a strong improvement in Greek competitiveness is needed to improve its trade balance in the long run and stabilise the NIIP. Finland, France, Belgium, Italy, Portugal and Spain are concerned to a lesser extent. Conversely, Germany and the Netherlands, which already have the highest NIIP, should reduce their STB, since the current ones imply ever increasing NIIP.

These results emphasize that the massive external trade surplus in Germany is a concern for the EA, since without a German adjustment other countries cannot adjust as well. First, a large NIIP for Germany can imply large negative NIIP for the rest of the EA if the euro exchange rate is in a way sensitive to EA wide NIIP. Second, increasing NIIP dynamics, even larger when STB is higher than current TB, thus indicates a strong increase in NIIP is to be expected unless price adjustment is done. The strong compression of internal demand in Greece has had no significant effect on the competitiveness of the country until now. More generally, overshooting and increasing imbalances of seven countries out of eleven stresses that macroeconomic policies conducted during the crisis have not been well-designed to correct external imbalances among EA countries in the sense that they do not favour stabilising NIIPs.

TABLE 4. TRADE BALANCE GAP FOR 11 EURO AREA COUNTRIES IN 2013 (% OF GDP)

	Net international investment position	Current account	Trade balance	Output gap (%)	Potential growth (%)	Weighted output gap of trade partners (%)	Structural trade balance	Structural trade balance target*	Trade balance gap
	(1)	(2)	(3)	(4)	(5)	(6)	(7) = (3) - (6) + (4)	(8) = [(5) − r] x (1) − [(2) − (3)]	(12) = (8) − (7)
Austria	1	2.7	3.7	-2.9	1.5	-2.0	2.8	1.0	-1.8
Belgium	46	-1.9	-0.1	-1.9	2.0	-2.7	0.7	2.2	1.6
Finland	16	-1.1	0.3	-3.1	2.0	-2.0	-0.8	1.5	2.3
France	-17	-1.3	-1.3	-2.9	1.7	-2.5	-1.7	0.0	1.6
Germany	48	7.5	6.2	-0.6	1.1	-2.6	8.3	-1.2	-9.5
Greece	-121	0.7	-0.2	-13.3	1.5	-2.1	-11.4	-1.5	9.8
Ireland	-105	6.6	23.3	-8.7	2.0	-2.4	17.0	15.6	-1.4
Italy	-30	1.0	2.6	-5.6	0.9	-2.2	-0.8	1.6	2.4
Netherlands	46	10.9	10.6	-4.3	1.8	-2.2	8.5	0.1	-8.5
Portugal	-119	0.5	1.7	-7.2	1.6	-3.0	-2.6	0.5	3.1
Spain	-98	0.8	2.9	-5.3	1.7	-2.8	0.3	1.3	1.0

* The structural trade balance target is the structural trade balance that is compatible with NIIP stability at its 2013 level. We assume that the gap between the current account and the trade balance (revenues, current transfers, the capital account and the financial account) is constant. We assume r = 1%.
Sources: OECD Economic Outlook 95, IMF WEO October 2014, Oxford Economics, IMF International Financial Statistics, Eurostat, OFCE-IMK-ECLM calculations

Drawing on STB and stable NIIP, we construct a small trade model that computes the required price adjustment of EA countries. Those price adjustments are by construction compatible with both an internal rebalancing–closing the output gap–and an external rebalancing–stabilizing the net international investment position (NIIP) at a sustainable level. The core of the model consists of equations linking import and export volumes to output variations and to competitors' prices. Imports react positively to domestic activity and to domestic prices, and negatively to competitors' prices. Exports react positively to foreign activity levels and to competitors' prices, and negatively to domestic export prices. A detailed description of the model and its calibration are given in the technical appendix. The main contribution of this modeling exercise relative to previous studies is that a global equilibrium is computed at the EA level. Instead of computing partial equilibrium price adjustments, i.e. those needed in one country without taking into account the effect of domestic price changes on the equilibrium of other countries, our methodology computes price adjustments that are compatible with internal and external adjustment of all EA countries simultaneously. Stated differently, we compute the equilibrium that should be reached if all EA countries were acting cooperatively. The rest of the world is assumed to adjust its demand for imports according to its activity level and to the EA export prices, but to keep its own prices unchanged.

Defining the target of the external adjustment of EA countries is a critical task. In the baseline scenario, we arbitrarily assume that NIIPs are sustainable over the long run provided they are within the ± 50% range of GDP (the sensitivity to this parameter is studied in alternative scenarios). Therefore, for those countries whose NIIP is already within ± 50%, the target of their external adjustment is simply to stabilize their NIIP at its current level. For those countries whose NIIP is below -50% (resp. above +50%), their target is to stabilize their NIIP at -50% (resp. +50%) at a 20-year horizon.

Results are summarized in the baseline scenario (table 5). The first column presents the NIIP targets. Greece, Ireland, Portugal and Spain are expected to improve their NIIP and reach the -50% level, while other countries are simply expected to stabilize their NIIP at its current level. The last two columns present the results in terms of real effective exchange rate (REER) adjustments and in terms of value added (VA) price adjustments. Note that VA price adjustments and REER adjustments differ precisely because all the countries are supposed to change their VA prices simultaneously: the REER incorporates changes in domestic prices but also changes in prices of multiple trade partners. All the adjustments are computed using the data available at the end of 2013, and therefore represent what remains to be done as of the beginning of 2014. In the baseline, export prices of countries outside the EA are supposed to remain constant in Euro terms. The computed adjustments are such that, if implemented immediately, all the countries would reach their NIIP targets in 20 years from now. The prescribed adjustments cannot be achieved instantly but will be gradually implemented, so our results in terms of VA prices should rather be understood as cumulative inflation differentials. Germany should for example increase its prices by 26.1% while Greece should decrease them by 6.9%, corresponding to a cumulative inflation differential of 33%, so the adjustment could be achieved in 20 years with an annual inflation differential of 1.65% between Germany and Greece. In terms of REER adjustments, and unsurprisingly, Germany and the Netherlands are shown to need a substantial real appreciation. Greece, on the other hand, still needs to depreciate by almost 14% despite its recent current account improvement, which depends on a strong cyclical component, related to the compression of its internal demand. The other crisis countries (Ireland, Italy, Spain, and Portugal) have already mostly completed their adjustment. Looking at the results in terms of VA

prices, the model predicts moderate negative price adjustments for only three countries: Belgium, Finland and Greece, and substantial positive price adjustments in Austria, Germany and the Netherlands. Given that these figures should be understood as deviations relatively to a global inflation trend, our results indicate that deflation is no more needed – even in crisis countries – in order to achieve the adjustment; only inflation lower than the EA average is required. Most of the adjustment should now go through inflation rates above the average in surplus countries. Since the model predicts price increases in most EA countries and since our baseline scenario assumes unchanged price levels outside the EA, the model predicts a loss of competitiveness of the EA as a whole and therefore a deterioration of its trade balance (of 2.8% of GDP, down to 0.8%). This result stems from the chosen NIIP country targets which sum up to an almost zero aggregate NIIP for the whole EA. As a consequence the model targets an almost balanced current account at the EA level, and therefore predicts a deterioration of the aggregate trade balance.

TABLE 5. BASELINE SCENARIO

	NIIP target (% GDP)	REER adjustment	VA price adjustment
Austria	0.5%	+14.9%	+26.6%
Belgium	45.8%	-16.1%	-6.0%
Finland	15.8%	-14.3%	-8.6%
France	-17.0%	-4.5%	+2.7%
Germany	48.4%	+21.8%	+26.1%
Greece	-50.0%	-13.7%	-6.9%
Ireland	-50.0%	+5.6%	+9.6%
Italy	-29.5%	+5.8%	+12.3%
Netherlands	46.3%	+19.5%	+25.0%
Portugal	-50.0%	-3.2%	+5.4%
Spain	-50.0%	+2.9%	+9.7%

If Greece is to reach a NIIP of -50% of GDP in 20 years from now, it must achieve a real depreciation of 13.7%. This can be obtained by decreasing its VA prices by 6.9% (assuming that the other EA countries also adjust their VA prices by the prescribed amounts and that prices outside the EA are unchanged).

Source: OFCE-IMK-ECLM calculations

The main conclusions can be summarized as follows. First, even though a substantial readjustment has been achieved since 2011, much still remains to be done. The price disequilibria between overvalued and undervalued countries within the EA could be as much as 35% under reasonable assumptions. Secondly, a rebalancing strategy should rely on maintaining inflation differentials within the EA over an extended period, with higher inflation in Germany and lower inflation in crisis countries; deflation is not required in the latter countries if the readjustment is implemented gradually. We claim hereafter that a coordinated wage policy, with substantial wage increases in Germany, would definitely be needed in order to achieve the rebalancing while limiting adjustment costs.

b. The case for a mechanism of wage coordination

Even if wages are mostly determined by market forces, governments may influence the dynamics of wages through modifications in minimum wages. Henceforth, we suggest introducing a European coordinated rule on the evolution of minimum wage in order to put an end to the downward wage adjustment. It would put a limit on internal devaluations (and then on the mechanisms of correction of imbalances).

Our proposal is that the rise in minimum wages would depend on the relative current account positions, with the aim of equilibrating external imbalances within the euro zone. The advantage of this policy compared to an automatic adjustment by market forces is that it would rest on cooperation between euro area countries, holding out the promise of much more favourable results in the aggregate. This would prevent Europe from falling into the vicious circle of deflation, while reducing current account imbalances, thereby increasing debt sustainability. Not only would it improve the macroeconomic situation, it would also mitigate the risks of poverty and dampen rising inequalities.

Minimum wages is a tool which often serves as a nominal anchor (Schulten, 2012; Herr and Kazandziska, 2011). Even if only a few workers directly receive the minimum wage (with the exception of France or Bulgaria), its evolution impacts on the whole structure of wages and its change over time, especially in countries where a few employees are covered by collective bargaining (Schulten and Müller, 2013). Moreover, it is generally ultimately set by the government – although there are frequently provisions for the social partners to play a role in its negotiation – and may then be easily coordinated at the euro area level. In Belgium and Greece, it was not the case, the level of minimum wage hinging on a collective agreement between social partners. But under the pressure of the Troika, it is legally fixed from now on in Greece. Besides, it must be taken into account that a statutory national minimum wage does not exist in all European countries. There are today two groups of countries in the euro area regarding the institutional features of minimum wage norms. The first group includes countries where there is a statutory national minimum wage and the second group concerns countries where minimum wages are negotiated by region and/or by sector and do not concern all employees (Italy, Austria, Sweden, Denmark, Cyprus and Finland). In those countries, wages can be relatively high. However many employees are not concerned by these minimal thresholds, because of their absence in certain sectors or because of the very limited extension of these minima to firms not covered by agreements. This was the case in particular in Germany, although the recent coalition agreement foresees the introduction of a statutory minimum wage in the country starting in 2015[7].

To promote a coordination of minimum wages evolution, many authors recommend using the open method of coordination (Schulten and Watt 2007, Schulten, 2008; Kampelmann, Garnero and Rycx, 2013) whereby the European Union defines wage targets and deadlines, and monitors the outcomes, but leaves member states free to work it out within their respective national frameworks (statutory

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[7] Until recently, Germany was in this group but a statutory minimum wage has been recently introduced with the consent of trade unions organisations and it should concern nearly all employees in December 2016. See Chagny and Le Bayon (2014) for an analysis of the discussions which have led to this introduction and of the impact on wages.

minimum wages, automatic extensions of collective agreements…). There have also been attempts by European authorities to set targets for minimum wages. For instance, a resolution (2011/2052 – INI) adopted by the European Parliament in 2011 asked the EC to start discussions about a legislative initiative on minimum income in Europe, "with due regard for differing practices, and for collective labour agreements and legislation in the various member states, bearing in mind that the definition of a minimum income remains the prerogative of each member state". It pointed the need to combat poverty, to achieve the workers' right to a decent living and to guarantee an income equal or higher than 60% of the median income in each member state (i.e. the poverty threshold).

To analyse the potential impact of a coordinated wage policy, we present simulations based on an augmented-version of the iAGS model[8]. The model describes the main euro area countries[9] and is extended to the United States, the United Kingdom and Japan.

The main features of iAGS model are that:

— The size of multipliers can vary according to the business cycle: fiscal impulses have a greater impact on GDP in bad times (when unemployment rate is very high compared to the equilibrium unemployment rate);

— Fiscal policy can have long run impact on potential GDP through hysteresis effects (austerity can alter potential GDP if investment is lowered or workers are excluded for long periods from the labour market for example);

— Euro area economies are interconnected through external trade. A recession in one country lowers demand in its partners, as its imports and their exports fall, so that GDP growth slows down in partner countries.

— The model includes a Taylor rule describing monetary policy. A zero lower bound on interest rate is added. Monetary policy then feeds back on economic activity and government interest expenditures through its effects on long term interest rates. The model then produces higher fiscal multipliers when monetary policy is at the lower bound.

To provide an in-depth analysis on deflation and external imbalances, it has been extended to account more accurately for the price-wage loop and for the impact of competitiveness on external trade. We have adopted a triangle model, as suggested by Gordon (1988), to represent the dynamics between prices and wages:

— Inflation depends on the growth of domestic prices (GDP deflator) and of foreign prices, simply computed as the weighted average of the foreign GDP deflators. All prices are expressed in terms of domestic money. The impact of foreign GDP deflator also depends on nominal exchange rates, which are exogenous;

— The growth of the domestic GDP deflator is determined as a constant mark-up on the growth of unit wage costs;

— Nominal wages are set according to a Phillips relation where the growth of wages at time (t) depends on the growth of nominal wages at time (t-1), expected inflation, the trend of labour

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[8] The model is not presented here but a full description of the first version of the model can be found in Blot et al. (2014a). Yet, it must be noted that the present simulations are realized with an updated version including competitiveness effect and current account dynamics.

[9] Germany, France, Italy, Spain, the Netherlands, Belgium, Ireland, Portugal, Greece, Austria and Finland.

productivity and the unemployment gap between the current unemployment rate and the NAIRU (non accelerating-inflation rate of unemployment). In the long run, real wages increase with labour productivity. Minimum wages may accelerate or restrain the growth of wages in the short term, whereas they grow at the same rate in the long term.

The role of expectations is essential when deflation issues are raised. In the model, inflation expectations are adaptive and adjust according to the spread between past inflation and an anchor, which is equal to the inflation target set by central banks. For convenience, the target is set at 2% for all central banks. The adjustment depends on the adjustment speed and may also respond in the short run to the business cycle. Here, we have indeed considered a scenario where inflation expectations decrease when the output gap widens.

Table 6 sums up the results of the baseline simulation (see Box for a description of the main underlying hypotheses). In the baseline, we simulate the path of inflation, the output gap, public debt levels (expressed in percentage points of GDP), current account and other macroeconomic variables. This baseline scenario depends on the fiscal impulses which have been forecast in the euro area from 2013 to 2015. By assumption, we include zero-forecast fiscal impulses beyond 2016. Public debt may not converge to the 60% threshold by 2032 in the baseline.

The baseline scenario clearly illustrates the risk of deflation, not in the euro area as a whole but in the most fragile countries. In Spain, prices would decline by 1% on average between 2014 and 2020. Deflation would occur despite a GDP growth recovery and would be triggered by sustained high unemployment. The negative output gap would also drag down expected inflation, reinforcing the deflationary pressures at least in the short run. The situation would be worst in Greece and Portugal, while Ireland would also enter a milder deflation. For the euro area as whole, inflation would not exceed 0.6% on average, which is far from the inflation target set by the ECB. France, Italy, the Netherlands and Belgium would escape these gloomy perspectives but nevertheless, they would record inflation rates below 1%. These countries would then remain under the threat of more severe negative shocks to expected inflation. The global impact on growth is unsettled because on the one hand, deflation increases real interest rates, which has a negative impact on the output gap, but on the other hand, the gain in competitiveness boosts exports and this has a positive impact on the output gap. This situation is still largely representative of what is happening in Spain. The deflation may hamper the reduction in private and public debts but the low growth of unit labour costs improves firms' mark ups and their ability to increase export market shares. This may then trigger a significant change in the share of value-added, at the expense of workers.

Table 6. Baseline scenario

In %

	Average annual growth	Average inflation rate	Average real interest rate	REER* evolution between	Increase (+) or decrease (-) in current account balance between	Public debt in
	2014-2020	2014-2020	2014-2020	2014-2032	2014-2032	2032
Germany	1.5	1.6	-0.5	8.9	1.2	25
France	1.9	0.5	0.6	-7.6	2.0	76
Italy	0.7	0.2	1.1	-15.1	7.6	49
Spain	2.2	-1.0	2.6	-28.8	16.7	98
Netherlands	1.9	0.5	0.7	-15.5	-0.3	35
Belgium	1.8	0.8	0.6	-1.5	1.4	50
Portugal	1.7	-1.2	3.3	-20.8	11.2	122
Ireland	3.2	-0.6	2.4	-19.9	5.9	62
Greece	2.4	-3.9	4.2	-53.1	34.5	244
Finland	1.9	1.5	0.0	-1.6	-2.7	48
Austria	1.7	1.2	0.2	-4.6	-1.7	26
Euro area	1.6	0.6	0.7	-1.5	4.7	54

Source: iAGS model

*: Real effective exchange rate

Besides, this baseline also illustrates the overshooting of the adjustment. The current account would indeed improve sharply in the countries where deflation occurs. From 2014 to 2030, which is the horizon over which the current account stabilizes in the simulations, Spain, Greece and Portugal would unambiguously become surplus countries. In these countries, real interest rates would be positive despite the negative output gap. This slows down the recovery as the transmission of monetary policy in those countries is impaired by deflation. Germany would improve its external balance yet and only the Netherlands, Austria and Finland would suffer from a small reduction in their current account balances. Thus, the average current account surplus of the euro area would also increasingly move to surplus. Nevertheless, caution is needed when interpreting the results of simulations on the current account. The dynamics of the current account also hinges on the balance of revenue which also depends on net external position. Some asset prices effects are not captured by the model. The feedback effects on the current account are not taken into account here. The dynamics of the current account is then essentially explained by net exports, which depend on external demand and the relative prices (or the real exchange rate). Yet, having this in mind, it appears clearly that the adjustment of external imbalances risks being excessive. The current account balance of Spain would indeed improve by more than 16 percentage points between 2014 and 2032, the horizon where the current account has stabilised. It is in line with the strong gain in competitiveness recorded for Spain. The same applies to Portugal, Ireland and Greece. It must be noted here that in the baseline scenario, only Germany would suffer from a loss of competitiveness. The current account would slightly improve nonetheless. In this scenario, France, Spain, Portugal and

Greece would not be able to reach the 60% debt-to-GDP ratio. For Ireland, debt would end at 62%. Nevertheless, it must be noted that public debt would be significantly reduced in France.

We then determine the additional fiscal impulse, which is needed to bring back public debt to 60% in 2032 in accordance with the treaties. Assuming that the fiscal impulses are left unchanged for 2014, we calculate a sequence of fiscal impulses over 2015-2032 that do not exceed -0.5% of GDP, in accordance with existing fiscal rules. Additional impulses are then implemented as long as debt exceeds 60% in 2032. We maintain a neutral fiscal policy after 2014 (i-e with a zero fiscal impulse) for countries which achieve 60% or below in the baseline scenario. Therefore public debt is left unchanged compared to table 6. This simple algorithm implies that the cumulated fiscal impulse is larger than in the baseline scenario for countries which converge towards a debt above the target.

Table 7 sums up the results of this simulation. Striking results are threefold. First, two countries – Portugal and Greece – are unable to achieve the debt-to-GDP target. The fiscal stance over 2014-2032 produces a cumulative fiscal impulse which lowers the average annual growth by nearly 0.4 point of GDP on average. This fiscal stance is inefficient in terms of public finance and costly in terms of growth as the fiscal multipliers are high when output gaps are strongly negative. Moreover, the rise in unemployment reinforces the deflation loop and tightens monetary policy through the increase of real interest rates. Second, France and Spain achieve the debt target in 2032, but under a much more restrictive fiscal stance than scheduled, especially for Spain. Both countries also suffer the same disease as Portugal and Greece: higher fiscal impulse and lower growth (-0.25 for Spain, -0.1 for France), which weighs on inflation (-0.06). These four countries also benefit from an improvement of their current accounts thanks to a competitiveness increase. On the contrary, other countries need less austerity than previously scheduled to achieve the fiscal debt target, which permits a small rebound of growth (from 0 to 0.1 p.p a year). These simulations show how the European fiscal strategy could widen divergence across euro area member states, reinforcing deflation in countries with the lowest output gaps, and consolidating the healthiest ones.

Table 7. Scenario where public debt cannot exceed 60% in 2032

In %

	Average annual growth	Average inflation rate	Average real interest rate	REER* evolution between	Increase (+) or decrease (-) in current account balance between	Public debt in
	2014-2020	2014-2020	2014-2020	2014-2032	2014-2032	2032
Germany	1.5	1.7	-0.5	9.0	1.2	23
France	1.7	0.5	0.7	-9.5	3.3	60
Italy	0.7	0.3	1.1	-14.4	7.0	52
Spain	1.9	-1.1	2.7	-33.4	20.4	60
Netherlands	2.0	0.7	0.6	-11.5	-2.0	60
Belgium	1.9	0.8	0.5	-0.6	0.8	60
Portugal	1.3	-1.3	3.4	-27.6	17.5	67
Ireland	3.1	-0.6	2.4	-20.1	6.1	60
Greece	2.0	-4.1	4.4	-61.3	42.0	196
Finland	1.8	1.5	0.0	-2.0	-2.5	43
Austria	1.8	1.3	0.0	-2.8	-2.6	42
Euro area	1.6	0.6	0.7	-1.5	5.4	47

Source: iAGS model

*: Real effective exchange rate

Box. Main hypotheses for the baseline simulations

The simulations start in 2014. To do so, we need to set some starting point values in 2013 for a set of variables. Output gaps for 2013 come from OECD forecasts. Potential growth for the baseline potential GDP is based on OFCE-IMK-ECLM projections (see Table 8). Concerning fiscal policy and budget variables, the main hypotheses are:

— The public debt in 2013 comes from OFCE-IMK-ECLM forecasts.

— We use the OFCE-IMK-ECLM forecasts for fiscal balance in 2013;

— We use the European Commission's autumn 2013 forecast of interest expenditures for 2013; combined with OECD forecasts of output gaps in 2013, and model estimates of the cyclical part of the fiscal balance, which gives the structural primary balance for 2013;

⸺ Fiscal impulses come from OFCE-IMK-ECLM forecasts for 2013, 2014 and 2015.

⸺ Current account balances for 2013 comes from IMF.

⸺ Inflation in 2013 comes from OFCE-IMK-ECLM forecasts.

Table 8. Main hypotheses for 2013

in %

Source	Public debt	Fiscal balance	Inflation rate	Current account	output gap	potential growth
	OFCE-IMK-ECLM	OFCE-IMK-ECLM	OFCE-IMK-ECLM	European Commission	OECD	OFCE-IMK-ECLM
Germany	81.7	-0.2	1.7	2.4	-1.0	1.3
France	90.0	-4.4	1.3	2.6	-6.2	2.0
Italy	126.5	-2.5	1.5	5.5	-5.5	1.3
Spain	86.1	-7.4	1.7	3.0	-8.5	2.0
Netherlands	68.8	-4.4	2.7	2.0	-2.8	2.0
Belgium	99.9	-3.5	1.3	3.5	-4.8	2.0
Portugal	119.1	-5.5	0.7	4.5	-6.1	1.5
Ireland	117.6	-8.0	0.8	4.0	-7.4	2.2
Greece	176.7	-6.7	-0.6	5.4	-14.1	1.9
Finland	53.1	-0.9	2.4	1.1	-2.1	2.2
Austria	74.6	-3.0	2.2	2.6	-1.1	1.6

Sources: European Commission, OFCE-IMK-ECLM forecasts.

Then, we introduce a simple rule by which minimum wages are adjusted according to the relative position of Eurozone countries' current account positions. For the group of countries where the current account (as % of GDP) at date (t-1) is lower by 1 percentage point than the euro area average, the nominal minimum wage is increased by 1% (deficit countries). If the current account is higher by 1 percentage point than the average, the minimum wage is increased by 3% (surplus countries). For the rest of the countries (balanced countries), the minimum wage is increased by 2%. The rule is applied for 10 years (2014-2024) and countries can move from one group to another according to the evolution of their relative current account position. The impact on prices crucially depends on the diffusion of minimum wages to the growth of nominal wages, which is assumed to be 0.4 in the short term. The results of this scenario are presented in table 9.

First, the impact on growth is limited as competitiveness and real interest rates effects partly offset each other. Deflation in Spain, Portugal, Ireland and Greece is lessened but not avoided. Inflation is globally higher by 0.5 % in the euro area, with large disparities between country groups. For Germany and the Netherlands, the two main surplus countries, inflation increases by about 1% on average. As prices rise, real effective exchange rates appreciate by 23 and 17 % respectively, fostering current account adjustments. These two countries experience a larger deterioration in their current account than the euro area as a whole.

For deficit countries (France, Italy, Belgium and Finland) the situation is reversed. Inflation is higher but only by 0.3 % on average. Therefore the relative competitive position is improved with a slightly negative growth of real effective exchange rates, leading to a small improvement of current account positions. Spain, Austria and Ireland are either balanced countries or moving from one group to another. Their adjustment in terms of competitiveness or current accounts is thus closer to the euro area average. Figure 6 illustrates the change in the current account position of the euro area which can be directly imputed to this wage coordination policy. After 20 years, the average current account balance of the euro area would be reduced by 4.3 % of GDP, with Germany, the Netherlands and Spain being the main contributors of this rebalancing process. It must yet be noted that these effects may be overestimated as there are no feedback effect in our model from the exchange rate. A relative higher inflation rate or a relative reduction in the average euro area current account balance may indeed lead to a relative depreciation of the euro. Finally our simulations show that a coordinated wage policy would play a key role in the reduction of macroeconomic imbalances.

However, if coordination of wage policy may help to boost inflation in a deflationary environment, it may not be sufficient. The exit of deflation may also hinge on other macroeconomic policy or on a stronger shock on wages. It is then fundamental to avoid excessive fiscal consolidation. Less austerity would help growth to recover in the most fragile countries. Unemployment rate would then decline more substantially reducing the negative impact on wages through the Phillips effect. A European initiative on public investment could participate to this process.

Table 9. Scenario with coordination of minimum wages

Percentage point difference with the table 5

	Average annual growth	Average inflation rate	Average real interest rate	REER* evolution between	Increase (+) or decrease (-) in current account balance between	Public debt in
	2014-2020	2014 2020	2014-2020	2014-2032	2014-2032	2032
Germany	-0,1	0,97	-0,45	23	-6,2	1,2
France	-0,1	0,25	-0,05	0,7	-1,7	0
Italy	-0,08	0,28	-0,09	1	-1,9	-0,6
Spain	-0,11	0,27	-0,1	5	-5,2	-0,1
Netherlands	-0,22	0,86	-0,33	17,6	-8,4	0
Belgium	-0,14	0,2	-0,01	-1,2	-0,6	0,1
Portugal	-0,17	0,92	-0,41	10,6	-11,5	-6,9
Ireland	-0,77	0,31	0	0,9	-8,1	0
Greece	-0,16	0,79	-0,34	15,6	-15,3	-30,3
Finland	-0,09	0,27	-0,06	2,5	-1,9	3,5
Austria	-0,09	0,75	-0,31	1,6	-1,5	-1,2
Euro area	-0,13	0,54	-0,21	6,2	-4,3	-1

Source: iAGS model

*: Real effective exchange rate

Figure 2.

Impact of wage indexation on the euro area current account, by countries
as % of euro area GDP

Legend: Ireland, Portugal, Greece, Italy, France, Spain, Netherlands, Germany, euro area current account balance

This graph is built as the difference between two simulations:
(2) - (1)
(1) The euro appreciates by 10% per year during 3 years (2014, 2015 and 2016)
(2) On top of the appreciation of the euro, a minimum wage rule is put in place, where surplus coutries implement a 3% increase of minimum wage, deficit countries a 1% increase and balanced countries a 2% increase. Country groups are redefined every year relatively to the euro area average during 10 years (2014 to 2024).

Source: iAGS model

4. Greening the economy

The European Union also needs an immediate and sustained boost in investment, to avoid deflation in the short-term, to prepare for the future and improve its sustainability in the long term. This is the proclaimed goal of the "€300 billion investment plan" recently announced by the European Commission's newly elected president, Jean-Claude Juncker. The current proposal does not go far enough though – the expected multiplier of 15:1 between private and public investments underlines the utter lack of fresh public funding committed to the plan. The ability of the new European Fund for Strategic Investments to mobilise hundreds of billions of private money over three years with €21 billion of (mostly recycled) EU public money can be questioned. Worse still, the Juncker plan has not clearly determined its target sectors and the projects it could potentially fund. It has not identified either the channels through which the projected increase in investments will be financed, or how it could be sustained in the medium to long term.

A European investment plan should strive to maximize both its short-term impact on activity and its long-term effects on the sustainability of future European growth – particularly regarding official EU policy goals such as the 20-20-20 objective[10]. This entails that investment in business-as-usual,

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[10] European 2020 Climate and Energy Package, setting a target of a 20% reduction in EU greenhouse gas emissions from 1990 levels, an increase in the share of EU energy consumption from renewable sources to 20% and a 20% improvement in energy efficiency.

unsustainable "brown" infrastructure should be avoided, as it maintains the European economy on a development pathway that grows harder to reverse the later the transition towards sustainability begins. This irreversibility of infrastructure investment makes energy a high priority sector.

We identify three sectors that fulfil the double criteria of short-term boost to growth and long-term sustainability: energy production and distribution, energy retrofit in the building sector, and sustainable mobility[11].

The strategy would hinge on a change of the relative prices of different sources of energy. Putting in place a carbon price can spur an increase in investment through the depreciation of existing energy- and carbon-intensive capital and an improvement in the profitability. The impact of this "Carbon fiscal shock" would be maximised by setting the carbon price at a relatively high level instantly, instead of following a more traditional progressive increase over time.

Given the double criteria of a short-term boost to economic activity and a long-term improvement of the sustainability of European economic growth, an EU investment strategy should:

- Put energy supply and energy efficiency in buildings and transport at its core, as these sectors are key for a sustainable economy and tend to have strong macroeconomic benefits (growth, jobs, trade and economic resilience);
- Build on the existing EU financial institutions and instruments to effectively deliver a short term boost in investment, and progressively adapt them to ensure this boost is sustained in the longer term.

The macroeconomic impacts of an EU-wide "Carbon fiscal shock" are then analysed through the results of simulation exercises using the ThreeME and E3ME models.

a. A "Carbon price shock to boost investment

In addition to the push strategy (put fresh money into an adapted financial pipeline, target money to selected sectors which are believed to be of strategic importance), a sound plan should adopt a complementary pull strategy (attract financing out of the pipeline) through appropriate tax systems, laws and norms, technical assistance. A "Carbon fiscal shock" – accompanied by appropriate compensation schemes – may not only attract financing for low carbon investments, but also strongly boost both public and private investments. By over compensation for a limited period of time (e.g. 5 years), implementation of carbon price (with a tax, an Emission trading scheme (ETS) or crediting instruments) would be facilitated and over compensation would provide a short term boost to the European economy, helping to fight the risk of deflation.

We now assess a policy package that combines a carbon tax of €100/tCO2 with fiscal stimulus in Europe. The carbon tax is introduced in 2015 and held constant in real terms; its revenues are recycled such that there is an overall positive stimulus (starting at 50% of revenues and reducing over

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[11] It is worth noting here that, when studying the financial capacity of the EU to increase investments, the public-private debate pops up: how much of the investments should be public, how much should be private, what is the leverage effect expected? We consider this discussion important, but think it is more relevant to base the analysis on sector specific studies and see – from the ground – what needs to be public money and what can be private money. More generally, we think that analyzing the sector needs for investment is a better starting point to elaborate an investment strategy than the source of the fresh money or the relevant institutions and instruments to be used by the plan.

time) to Europe's economies. The revenue recycling takes the form of reductions in income taxes, subsidies to energy-intensive firms and public investment in energy efficiency.

The E3ME macro-econometric simulation model from Cambridge Econometrics was used to carry out the assessment. E3ME does not assume full employment or optimal use of economic resources, meaning it is well-suited to modelling Europe's economies post-recession and the potential effects of fiscal stimulus[12]. Further information about the E3ME model may be found in the model website[13].

The modelling finds that there could be short-term economic benefits from the policy package, of up to 1.4% of GDP. One should note that this results from a particularly large estimate of the double dividend to be expected from investment in the energy transition. In the E3ME simulation, employment could also increase by up to 0.6% in this period. There are positive economic impacts in all EU Member States, but some of the largest benefits are in countries that currently have high unemployment rates.

The modelling also finds that there are longer-term macroeconomic benefits. These benefits are smaller than the short-term impacts and are driven by reductions in fuel imports to Europe. Employment increases in the long run as there is some switching from energy-intensive to labour-intensive activities.

The long-run modelling does not factor in the higher levels of debt that are taken on at European level; these would need to be paid back at some point in the future and could reduce GDP growth at this time. However, as Europe's economies would still benefit from reduced fuel imports, it is reasonable to assume that, over the projection period as a whole, results would be positive.

CO_2 emissions fall by around 14% as a result of the carbon tax and energy efficiency measures. This reduction would put Europe close to being on track to meet its 2030 emissions target.

The policy scenario is decomposed in four sub scenarios. They are:

*   S1 – A pan-European carbon tax. The carbon tax is introduced at a rate of €100/tCO_2 in 2015 and maintained in real terms over the projection period. It is applied to energy-related and process emissions across all sectors and replaces the EU ETS (including any revenues generated from auctioned allowances to the power sector).

*   S2 – The carbon tax plus revenue recycling to households and industry. This scenario includes the same carbon tax as S1 but also includes revenue recycling to households in the form of lower income tax rates (70% of the revenues) and to industry in the form of lump-sum subsidies (25% of the revenues). In addition, there is a short-term over-recycling of revenues, starting with a 50% boost in 2015, gradually declining to zero over a five-year period (see table 10).

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[12] E3ME is a simulation model based on a post-Keynesian approach. Unlike the more common Computable General Equilibrium (CGE) modelling approach, E3ME does not assume optimisation and full utilisation of economic capacity, hence allowing for underemployement. These features make the model a suitable tool for evaluating fiscal stimulus. By acknowledging that Europe's economies are suffering from a shortage of aggregate demand, the model can be used to estimate the effects of various measures to boost domestic consumption. The method of stimulus here (borrowing at European level to finance national spending) has some resemblance to a European programme of quantitative easing (QE). However, QE would be very unlikely to include the same targeting of spending.

[13] http://www.e3me.com

* S3 – The carbon tax plus revenue recycling in S2 and investment in energy efficiency. In this scenario the final 5% of revenues is used to invest in household energy efficiency measures. We apply a coefficient derived from the IEA's *World Energy Outlook* to estimate additional energy savings. We assume that all the efficiency measures lead to reductions in household use of energy, principally gas but also electricity and heating oil. As in S2, there is a short-term over-compensation of revenues.

* S4 – Carbon tax, revenue recycling and BTAs. In addition to the measures in S3, in S4 we introduce Border Tax Adjustments on imports of the 'Big 6' energy-intensive industries (pulp & paper, refining, basic inorganic chemicals, cement and lime, iron and steel, aluminium). The revenues from these BTAs are assumed to be used to finance low-carbon development outside the EU and do not benefit the domestic economy.

Table 10. How the carbon tax revenues are allocated, %

Scen		2015	2016	2017	2018	2019	2020
S2	Households	105.0	98.0	91.0	84.0	77.0	70.0
	Industry	37.5	35.0	32.5	30.0	27.5	25.0
	Energy efficiency	0.0	0.0	0.0	0.0	0.0	0.0
	Total	142.5	133.0	123.5	114.0	104.5	95.0
S3-4	Households	105.0	98.0	91.0	84.0	77.0	70.0
	Industry	37.5	35.0	32.5	30.0	27.5	25.0
	Energy efficiency	7.5	7.0	6.5	6.0	5.5	5.0
	Total	150.0	140.0	130.0	120.0	110.0	100.0

The carbon tax is entered as an additional tax on fuel consumption, with the rate depending on the fuels' carbon contents. It is assumed that the electricity sector passes on its costs in full but other sectors may be restricted from doing so by international competition; if this is the case then they will likely suffer a loss of profitability. It is assumed that the revenues are recycled by national administrations and there are no cross-border transfers (apart from the BTA revenues, see below). As the EU's Member States already have excise duties on fuels it is assumed that there is no increase in transaction costs and all the additional revenues are available for recycling.

The policy scenario suggests that the over-recycling of revenues comes from a European fund and is therefore not included in national balance sheets. It follows that we have an assumption that there is no direct crowding out of economic activity and the stimulus is additional to everything else that is going on in the economy. There may, however, be indirect crowding out, for example if Member States start reaching full employment or sectors reach their production capacity; this effect is captured by the model's equations but, given current growth rates, it seems rather unlikely that output will reach capacity levels.

The BTAs are modelled as an increase in import prices. The rate of the price increase is determined by the carbon intensity of EU production and EU carbon prices; this is added as a tax on imports of the specified products from outside the EU.

Realistically, BTAs are only likely to be applied to a few selected products. In our analysis we have expanded these products to cover the entire NACE 2-digit parent sectors; even so, these sectors contribute a small share of total GVA in Europe so we would not expect large economic impacts from this measure. The aim of the BTAs therefore is not to improve macroeconomic results but to offer protection to the specific EU industries that are exposed to competitiveness issues and 'carbon leakage'.

Figure 3 shows the impacts of the full policy package on GDP (S4 compared to baseline, over compensation break down). There is an immediate stimulus effect worth about 1.1% of GDP, which increases up to 2017, reaching around 1.4% of GDP. Beyond 2017, the stimulus effect tails off, and GDP is around 0.8% higher than in the baseline beyond 2020.

Figure 3. EU28 GDP, S4, % difference from baseline
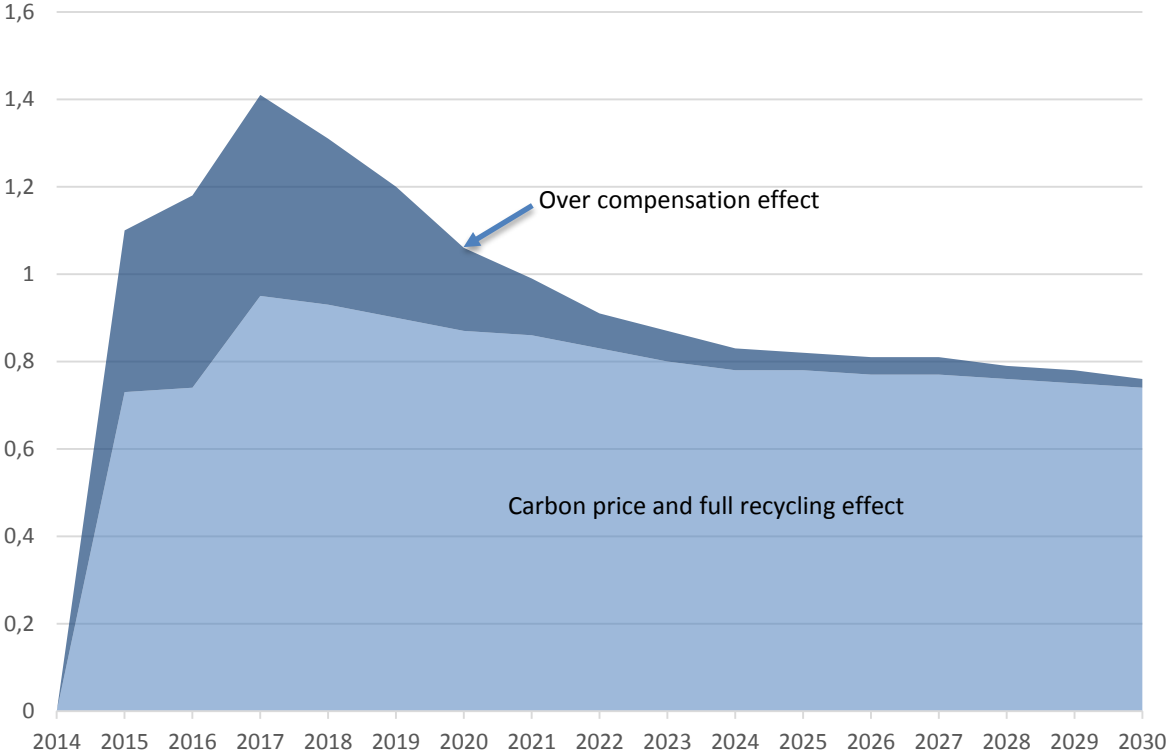
Source: E3ME.

The stimulus is financed by borrowing at European level and, in this scenario, it would remain as an outstanding debt as we have not included a repayment mechanism. However, even if the debt were repaid later in the projection period we could still expect to see a small long-term positive effect due to the restructuring that arises from the carbon tax and energy-efficiency measures. Employment increases by around 0.6% (short run) and 0.3% (long run) compared to the baseline, following a

similar pattern over time to GDP. According to our results, the policy package thus stimulates both higher levels of economic activity and employment.

Table 11 shows the evolution of key macroeconomic indicators over the projection period. The pattern is one of increased consumption by households (due to the lower income taxes) and increased investment (primarily in energy-efficient equipment). Trade effects are quite limited in scope, although for imports this outcome represents a combination of lower fuel imports and higher imports of consumer goods (see below). Inflation increases, with the price level about 2% higher in S4 than in the baseline. It would therefore be important to ensure that low-income households are compensated for higher electricity and fuel prices.

Table 11. EU28 summary of results, S4, % difference from baseline

	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2025**
GDP	1.1	1.2	1.4	1.3	1.2	1.1	0.8
Consumption	0.9	1.3	1.7	1.6	1.5	1.3	1.0
Investment	2.9	1.9	2.3	1.8	1.6	1.4	1.1
Exports	-0.3	-0.3	-0.3	-0.2	-0.2	-0.3	-0.3
Imports	0.8	0.3	0.6	0.4	0.4	0.3	0.0
Price index	1.7	1.9	1.9	2.0	2.0	2.1	1.9
Employment	0.6	0.5	0.6	0.6	0.5	0.5	0.3

Source: E3ME.

The GDP impacts are positive throughout the projection period. In the short term, there is a stimulus effect from the over-recycling of revenues. This stimulus is only effective because there are unused economic resources across Europe in the projection period; if Europe's economies were already operating at full capacity, inflation would likely be the result, rather than an increase in real activity.

However, the modelling results also show long-term benefits. These are due to some of the structural shifts that occur in the scenario. There are two main ones:

*   There is a positive effect on Europe's trade balance from the reduced fuel imports – fuel consumption falls as a result of both the carbon price (S1) and the energy-efficiency measures (S3). A large share of the savings in imported fuels is spent on goods that are, at least in part, produced domestically. This boosts domestic production levels.

*   There is a transfer from businesses to households – a large share of the carbon tax is paid by business, more than the 25% of revenues that is recycled back to industry. Some sectors, such as electricity generation, can pass these costs on to final consumers but others are unable to pass costs on, due to foreign competition. Lower profits in these sectors are matched by higher real household incomes. As households have lower savings rates and higher domestic consumption rates than businesses (e.g. multinationals' profits may flow abroad), this creates more activity within Europe.

5. Conclusion

The paper's key message about fiscal consolidation is that that a backloaded consolidation would have been a superior strategy to a frontloaded one, as the real costs of consolidation would have been minimized and debt convergence at a 20-year horizon achieved. The paper also evaluates the extent of real exchange rate misalignments within the Euro area, and discusses a structural reform consisting in a coordinated minimum wage policy in the Euro area. Another policy alternative to fiscal consolidation would be to "green" the economy via a sharp and immediate carbon-tax policy complemented with a fiscal impulse. The paper gives an assessment of the impact of such an alternative.

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7. **Appendix** Computing structural trade balances

Structural trade balances can be computed by correcting trade balances from the differentiated effects of business cycle among countries. The idea is to estimate trade balances with closed output gaps, while neglecting the effect of relative prices adjustments, that is to say that we assume constant market shares in the long run (this assumption is relaxed in the second part of the chapter).

Assume that the volume of exports x_i of country i depends on the foreign demand d_i^{EX}:

$$x_i = d_i^{EX}$$

Similarly, the volume of imports m_i of country i depends on the domestic output y_i:

$$m_i = y_i$$

The long run volume of imports is equal to the potential domestic output $\overline{m_i} = \overline{y_i}$. It follows that $\overline{m_i} = m_i - (y_i - \overline{y_i})$.

As bilateral trade imposes $m_{ij} = x_{ji}$ we deduce:

$$d_i^{EX} = \sum_j wx_i^j\, m_j = \sum_j wx_i^j y_j \quad \text{and} \quad \overline{d_i^{EX}} = \sum_j wx_i^j \overline{y_J}$$

where wx_i^j is the share of country j in the exports of country i.

The structural trade balance is then $STB = \overline{x_i} - \overline{m_i} = x_i - m_i + \underbrace{(y_i - \overline{y_i})}_{output\ gap\ of\ country\ i} -$

$\underbrace{\sum_j wx_i^j (y_j - \overline{y_J})}_{\substack{weighted\ output\ gap \\ of\ trade\ partners}}$