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## Quantifying the potential macroeconomic effects of the Europe 2020 strategy: stylised scenarios

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## **Quantifying the potential macroeconomic effects of the Europe 2020 strategy: stylised scenarios**

Alexandr Hobza and Gilles Mourre<sup>1</sup>

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## EXECUTIVE SUMMARY

*The Europe 2020 presents an ambitious and comprehensive strategy to guide the EU out of the economic crisis, to ensure macroeconomic stability and to put in place an ambitious structural reform agenda. An essential part of this strategy is the introduction of reforms with a medium- to long-term horizon that focus on promoting the sustainability of public finances, enhancing potential growth and realising the 2020 objectives, i.e. ensuring that the EU becomes prosperous, green and fair.*

*Such a comprehensive reform agenda can generate significant gains in terms of additional growth and employment as well as help ensure longer-term sustainability of public finances. Using the macroeconomic model QUEST III, DG ECFIN explored the possible extent of these gains. For this purpose, several stylised scenarios combining fiscal consolidation efforts with differentiated progress in implementing structural reforms have been constructed. The simulations do not attempt to model specific policies foreseen under the thematic pillar of Europe 2020 because the detailed policy agendas are still to be designed and agreed. Their objective is to demonstrate broad benefits that can bring some types of policy measures envisaged under Europe 2020 and the results should thus be seen as purely stylised and illustrative.*

### **A set of scenarios**

*To demonstrate the broad benefits of Europe 2020 actions, several scenarios were built, which differ in both the breadth and depth of reforms, i.e. they consider differing range of reforms as well as different degree of progress across scenarios. They demonstrate the effects of (ambitious) fiscal consolidation alone and in combination with structural reforms. The structural reform scenarios combine assumptions on the degree of progress in meeting some of the headline targets (e.g. employment rate and R&D expenditures) with assumptions on progress on some of the policy variables, e.g. mark-ups, fixed costs, capital costs or unemployment benefit replacement rates (measured as closing a certain part of the performance gap with the three best-performing EU countries). All scenarios assume that policy measures start to be implemented in 2011 and will be phased in over a period of several years. In technical terms, the scenarios combine QUEST*

*multipliers of different reforms to obtain the overall growth dividend.*

*The following scenarios have been constructed:*

- *The baseline scenario ("unchanged policy" scenario) – embeds the adverse impact of the crisis on potential output and assumes an increase in financing costs due to a protracted resolution of financial sector troubles. It also contains the effect of a gradual fiscal adjustment of 0.5% of GDP every year until the Medium Term Objectives (MTO) are reached, which is the minimum speed of consolidation that the Stability and Growth Pact (SGP) recommends.*
- *More ambitious fiscal consolidation – this fiscal policy scenario considers a far stronger fiscal consolidation of 1% of GDP annually (i.e. 0.5 p.p. more than in the baseline).*
- *Limited structural reform – this scenario assumes that, due to the constrained budgetary resources, reform efforts focus on measures with no budgetary costs (e.g. increasing competition, reducing administrative burden or limited budget-neutral tax reforms) which generally succeed in closing 1/10 of the gaps with EU best performers.*
- *Medium reform – this scenario assumes that reforms have gained momentum across all the policy areas, leading to important increases in knowledge-oriented expenditures and significant reforms in product and labour markets (generally assuming 1/3 reduction in the gaps with the best performers).*
- *Advanced reform – this scenario brings the highest gains, with very advanced reforms carried out across the board. It generally assumes a 1/2 reduction in the gaps with the best performers which, for example, means reductions in mark-ups or in risk premia on intangible capital to the US levels.*

### **Macroeconomic outcomes of the scenarios**

*Progress in implementing structural reforms under the main priority areas of EU2020 can generate significant gains in terms of increasing output,*

creating jobs and reducing unemployment. By 2020, GDP could increase from around 1½% in the limited structural reform scenario up to 7% in the advanced reform scenario compared to the baseline thanks to the implementation of reform policies. Structural reforms thus could help boost annual growth between 2010 and 2020 from 1.7% in the limited reform scenario up to 2.2% in the ambitious reform scenario, to be compared with 1.5% in the baseline. Employment gains would also be considerable: between around 1% and 4½%, which means creating additional 1.5 to almost 11 million jobs.

The extent of the benefits will strongly depend on the depth as well as breadth of undertaken reforms. If the EU succeeds in generating the reform momentum necessary to realise the Europe 2020 vision, the gains could be very substantial. While the simulations do not model specific policies or cover all the policy areas under Europe 2020, the advanced reform scenario shows that the EU could succeed in meeting its employment and R&D targets envisaged in strategy. As the effects of reforms take time to materialise, the long-run gains would still be higher by around 1/3 to 1/2. Such an ambitious scenario would require a significant departure from the past policies and a strong political commitment and consensus on the need for change, which might be difficult to find in reality.

On the other hand, piecemeal and timid reform will be insufficient to generate more substantial benefits and would mean a political failure of the Europe 2020 strategy. Intermediate reform scenarios lead to some gains, but clearly less than the full implementation of the strategy.

The results also emphasise that while ambitious fiscal consolidation is crucial to rein in public debt increases structural reforms might support this effort through increasing both GDP and tax revenues. The speed of consolidation needs to go beyond the 0.5% annual adjustment in public balance, which is the minimum required by the Growth and Stability Pact (SGP), which would imply that public debt would approach 100% of GDP in 2020. Fiscal consolidation will not affect negatively GDP growth in the longer-run: it will bring about a slight increase in GDP by 2020, although some GDP loss may be experienced in the short-run. Progress with structural reforms, increasing potential growth and expanding tax bases, can help significantly these efforts with the downward effect on the debt-to-GDP ratio ranging between 4½ p.p. and 14½ p.p.. However, even in the most optimistic scenario, the debt levels would remain well above the 60% reference value embedded in the SGP.

## 1. INTRODUCTION

**The EU has launched its new economic strategy – "Europe 2020" – a policy agenda for Europe to exit from the crisis and, at the same time, to secure macro-economic stability, healthy public finances and sustainable and inclusive economic growth.** In June 2010, the European Union's Heads of State and Government adopted the main elements of the strategy, in line with the proposal by the European Commission made in March 2010 and following discussions in the Council of Ministers. In the following months, the detailed policy agendas with specific reform measures at both EU and national levels as well as governance arrangements of the strategy will have to be devised and agreed. As a successor to the Lisbon Strategy for growth and jobs, Europe 2020 provides a framework for economic and structural policies in the EU. The strategy will bring value added and consistency to national reform processes by setting common policy targets and establishing an enhanced macro-structural surveillance. Europe 2020 outlines a comprehensive exit strategy, which combines fiscal consolidation with a tailored structural reform agenda that actually supports growth and unblocks the most important bottlenecks to growth.

**The lessons from past experiences and economic analysis indicate that a well-designed and convincing policy agenda aimed at strengthening the supply side of the economy should be an essential part of the policy response to lead the EU out of the crisis.** This can mitigate the adverse impact of the crisis on potential output of the European economies, help address the long-run implications of population ageing and also contribute to the efforts to consolidate public finances. Therefore, an essential part of this strategy is the introduction of reforms with a medium- to long-term horizon that focus on promoting the sustainability of public finances, enhancing potential growth and realising the 2020 objectives, i.e. ensuring that the EU becomes prosperous, green and fair.

**Such a comprehensive reform agenda can generate significant gains in terms of additional growth and employment as well as help ensure longer-term sustainability of public finances.** This paper attempts to explore the possible extent of these gains using the ECFIN dynamic stochastic

general equilibrium (DSGE) model QUEST III.<sup>(2)</sup> For this purpose, several stylised scenarios combining fiscal consolidation efforts with differentiated progress in implementing structural reforms have been constructed. These scenarios combine simulations of different reforms to obtain the growth dividend of reform.

**The structure of the remainder of the paper is as follows.** Section 2 presents the scope and limitations of the modelling exercise. Section 3 describes the design of set of "no-policy" and "policy" scenarios for Europe 2020 and section 4 discusses the macroeconomic outcomes of these scenarios. Annex presents additional information on the calibration of shocks and detailed results.

## 2. THE SCOPE AND LIMITATIONS OF THE MODELLING EXERCISE

**The scenarios do not attempt to model specific policies foreseen under the thematic pillar of Europe 2020 because the detailed policy agendas are still to be designed and agreed.** Their objective is to demonstrate broad benefits of packages of policy measures envisaged in the Commissions proposal for Europe 2020 strategy: consequently the results should be seen as purely stylised and illustrative. Hence, the results should not be *stricto sensu* seen as representing the economic benefits associated with the implementation of the Europe 2020 strategy. They are intended to underline the point that progress with structural reforms can bring substantial dividend. The results are to a large extent driven by the assumptions made on the extent and pace of structural reforms, which emphasises the fact that the extent of economic benefits is conditional on

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(2) QUEST III is an estimated dynamic stochastic general equilibrium model which was developed in DG ECFIN and is used for policy analysis (for a description of the model see Ratto et al. (2009) and Roeger et al. (2009)). The structural reform simulations used in this paper are based on the semi-endogenous growth version of the model (see Roeger et al. (2008)). The QUEST III model is suitable for the analysis of macroeconomic effects of structural reforms as it is a micro-founded model with full dynamics, whose equations are explicitly derived from intertemporal optimisation under technological, budgetary and institutional constraints. It also features nominal and real frictions, as well as financial frictions in the form of liquidity constrained households. It also incorporates semi-endogenous growth features and accumulation of human capital.

the policy efforts made (which need to be very high in the most ambitious scenarios).

**Where possible, these simulations take as a starting point some of the existing quantitative targets and show the macroeconomic effects of meeting these targets or making some progress towards them.** In other areas, the simulations focus on the economic transmission channels through which effects of reforms materialise and make broad assumptions on the progress the EU can achieve. As individual reforms can work through several of these channels, it is not possible to make a one-to-one correspondence between the simulated effects and specific reform measures. The results should rather be seen as economic effects of coherent packages of reform measures geared towards boosting the performance of the economy in the priority areas of Europe 2020.

**Bearing these caveats in mind, the QUEST III model has a rich structure which allows covering a wide range of policy agendas included in Europe 2020.** The model is well suited to simulate effects of policies to enhance sustainability of public finances by proceeding with fiscal consolidation. The simulations also assess the potential impacts of research and innovation policies aimed at increasing R&D/innovation intensity either through public spending (using tax credits or wage subsidies) or through improving framework conditions for innovation (e.g. better access to finances or reduction in market entry costs). They also include increasing educational spending and policies to upgrade skills. The scenarios also consider policies to modernise labour markets and create jobs by increasing labour participation and improving financial incentives to work (e.g. tax shifts from low- to high-skilled labour and away from labour to consumption<sup>(3)</sup>); or reforms in unemployment benefit schemes) and wage-setting policies. The policy agenda aimed at making progress in completing the single market (e.g. in the services

sector) and efforts to boost industrial competitiveness are modelled through their impact on mark-ups and administrative burdens/fixed costs (reductions in overhead costs can also be due to the progress in the EU digital agenda and the simplified communication with public administrations, e.g. electronic tax receipts).

**The scenarios exploit the wealth of existing simulations as well as the latest work undertaken by ECFIN to assess some of the topical policy issues.** Table 1 summarises the policy variables that are available in the QUEST III model and that can be associated with types of reforms foreseen in the context of the Europe 2020 strategy and groups them under measures in labour markets, product markets and in the area of knowledge and innovation. The majority of structural reform simulations that were used as input into this exercise were published in Röger et al. (2008).<sup>(4)</sup> Effects of increases in education spending are based on Varga and in't Veld (2009). The effects of fiscal consolidation are based on simulations presented in the 2010 Public Finances in EMU Report (European Commission, 2010).

**However, these simulations do not capture all types of policies foreseen under Europe 2020. This is in part due to the fact that the relevant mechanisms are not in the model or that the potential effects of some of the foreseen actions would be too speculative at this juncture.** The omitted policies, for example, are initiatives to fight poverty and social exclusion, policies to increase broadband coverage or the quality aspects of public spending on R&D or education. Also, not all relevant dimensions of the flexicurity agenda are fully integrated in the simulations. The scenarios also do not directly cover the policies to meet the climate change targets and to promote "green" growth policies. Nevertheless, the results of simulations made with an extended version of the QUEST III model which allows to investigate interactions between the environmental and innovation policy instruments (see Conte et al., 2010) are briefly discussed below. Some of these

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<sup>(3)</sup> Due to the severe constraints on public finances in a majority of EU countries, the simulations focus on budget-neutral tax shifts rather than reductions in tax wedge (such an exercise is for example undertaken in Coenen et al. (2007)). The tax shifts allow to assess the effects of reducing the existing distortionary effects in the tax system, i.e. the tax shift from labour taxes to consumption taxes, and lifting the tax burden from the low-wage workers, for whom the disincentives to work are typically the strongest, i.e. the tax shift from low-skilled to high-skilled workers.

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<sup>(4)</sup> In order to explore the positive impact of the structural reforms on public finances, ECFIN has produced a new set of simulations in which the budget rule in the model, ensuring that budget is balanced in the medium run, is switched off until 2025 and public expenditures are fixed in real terms, thus enabling us to gauge the impact of reforms on public debt.



policies could further add to the overall effects while others may embed trade-offs with the growth objective of the Europe 2020 strategy.

**The adopted approach is justified by the objective of the exercise, i.e. to show potential gains from structural reforms, and the existing limitations, i.e. the lack of information on concrete policy agendas.** By focusing on the transmission channels of reforms rather than analysing concrete measures, it also avoids the problem of double counting of effects of reforms that work through the same policy channels. Similar modelling exercises looking at the possible extent of macroeconomic gains from structural reforms were undertaken by, among others, Bayoumi et al. (2004), Eevaert and Schule (2006) or Roeger et al. (2009, 2010). On the other hand, the results are stylised and cannot be used as a justification for specific policy proposals. An alternative approach would be to focus on concrete reforms and assess their effects.

At a macroeconomic level, this was for example done in Arpaia et al. (2007) or the European Commission (2007), both of which attempted to quantify the potential gains of policies pursued in the context of Lisbon Strategy for Growth and Jobs. Furthermore, there is a wealth of micro-based studies which undertake in-depth analyses of reforms in labour and product markets, some of which use the partial equilibrium framework but others also employ general equilibrium modelling to derive effects at the macroeconomic level. Examples of the latter could be the assessments of the potential impact of the Services Directive by the CPB (Kox et al., 2004) or Copenhagen Economics (2005a and 2005b).

**Table 1:**  
**Policy variables in QUEST III and structural reforms under Europe 2020**

Policy areas	Policy variables/transmission channels in QUEST III	Examples of possible reform measures
Knowledge and innovation	Tax-credit for R&D expenditures (subsidy) or wage subsidy for R&D personnel	Policies to boost private R&D through tax incentives and subsidies on wages of R&D personnel
	Intangible capital costs (risk premium on intangible capital)	Improved availability of financing and venture capital (particularly for SMEs)
	Entry barriers in (R&D intensive) intermediate goods sector	Cutting the cost and the time to set up a new firm
Product markets	Education spending	Policies to increase expenditures on education and/or increase its effectiveness; policies to increase quality of secondary/tertiary education; lifelong learning policies.
	Final goods market mark-up	Higher competition through e.g. lower ad hoc state aids and open public procurement; completion of the Internal Market; higher competition in services sector (e.g. professional services, network services, retail); improved business environment, including free entry in market and more efficient exit.
	Firms' administrative burdens (overhead labour)	Reductions in administrative and regulatory burdens, e.g. legal requirements, tax administration, registering property, dealing with licences; increased efficiency of judicial system (enforcing contracts); administrative opacity; greater take-up and efficiency of e-government services.
	Tangible capital costs (risk premium on tangible capital)	Improved access to finance (particularly for SMEs).
Labour markets	Unemployment benefit replacement rate	Reforms of tax-benefit systems (e.g. reductions in average and marginal tax rates; reductions in the generosity of (long-run) unemployment benefits; eligibility conditions).
	Wage mark up	Fixing aggregate wage targets compatible with macro productivity developments, price stability and external competitiveness (e.g. wage indexation clauses); allowing differentiation wages by regions and skills (e.g. minimum wage provisions, decentralised wage bargaining or two-tier bargaining institutions); ALMPs (reduce bargaining power of insiders)
	Tax shift from labour to VAT or tax shift from low-skilled to high- skilled labour	Tax system reforms aimed at reducing distortions and disincentive effects for low-skilled/wage earners

Source: European Commission.

### 3. DESCRIPTION OF SCENARIOS

#### 3.1 Baseline scenario

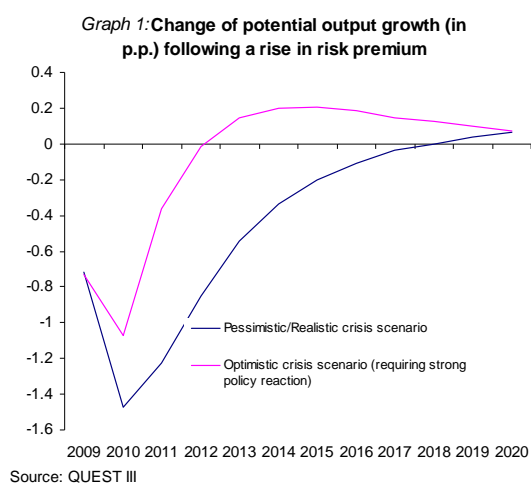
**A baseline scenario was constructed to be able to track the evolution of economic variables of interest in time and to present predicted changes in levels of some of these variables, e.g. debt-to-GDP ratio, employment and unemployment rates.** Building a baseline scenario showing the evolution of levels of main variables is necessary as the results provided by the QUEST model only show deviations from its own baseline.

**The baseline scenario embeds the adverse impact of the crisis on potential output and assumes an increase in financing cost due to a protracted resolution of financial sector troubles.** It takes as a starting point the

Commission's spring 2009 forecast and makes use of the macroeconomic projections in the 2009 Ageing Report (European Commission, 2009a), assuming that potential growth which declined due to the impact of the crisis will gradually return to the estimated pre-crisis level by 2020.<sup>(5)</sup> Given the severity and scope of the current crisis, it is

<sup>(5)</sup> The 'lost decade' scenario shows potential growth taking ten years to return to its pre-crisis level, both labour productivity and labour input are assumed to reach the baseline AWG growth rate in 2020. Thereafter this scenario follows the same path as in the absence of the crisis, but the output lost during the crisis years is definitely lost. The updated "lost decade" scenario used the potential output estimate of the Output Gap Working Group based on the ECFIN 2009 autumn forecast: potential output growth is halved during 2009-2011, compared with the pre-crisis period. Then potential growth increases gradually to reach the 2020 value contained in the long-term economic projection presented in the 2009 Ageing Report, which takes on board the depressive effect of the shrinking of working-age population on labour supply.

highly likely that the recovery will be characterised by a protracted period of slow growth, and a – mostly likely temporary – reduction in potential GDP growth.<sup>(6)</sup> This might be due to the increases in the cost of capital due to the real economy effects of balance-sheet adjustments in the financial sector and the restructuring of banks, even in the presence of large recapitalisation packages. Moreover, there may be a possible shift in attitude to risk leading to a pervasive deleveraging and a structurally and permanently higher cost of capital. In this respect, the baseline scenario is broadly consistent with a simulated long-lasting increase in the risk premium by 200 basis points during the crisis, which unwinds very slowly to 100 basis points (see the realistic/pessimistic scenario in Graph 1).<sup>(7)</sup> Additional factors that may create a lasting drag on potential growth are a delayed reallocation of resource keeping the labour forced durably underutilised, permanent loss of human capital due to long unemployment spells ("the hysteresis effect") and slower growth in total factor productivity, owing to a cut in intangible investments and R&D.

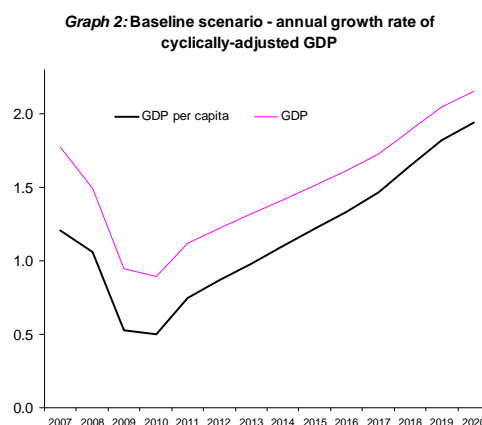


<sup>(6)</sup> Under a conventional business cycle interpretation, a cyclical trough should leave potential growth unaltered, as a period of low growth would be followed by a period of growth above potential.

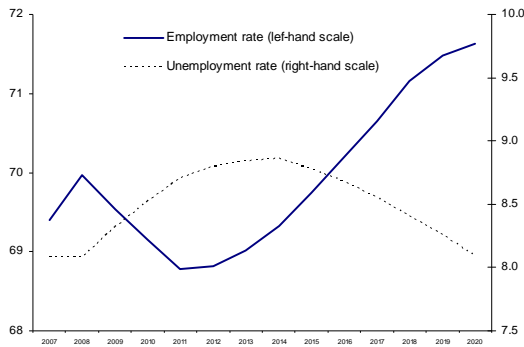
<sup>(7)</sup> For more details on these simulations see Hobza et al. (2009). The baseline scenario presented here corresponds to the theoretical case n°2: "Permanent loss in potential output level". The impact of the crisis on potential output could be considerably lower, though still significant, if the currently experienced hikes in risk premia prove only temporary, in which case the baseline scenario would appear overly conservative.

**In the baseline, employment growth becomes negative during the crisis, recovers to pre-crisis level in the middle of the coming decade and decline again to close to zero, reflecting the demographic ageing taking its toll.** The recovery of trend employment growth in the middle of the decade is compatible with the return of the NAIRU to the pre-crisis level. This implies that, once the reallocation of labour induced by the crisis starts taking place, the NAIRU steadily declines and the participation rate increases to reflect the large "pre-crisis" strands of reforms taken on the labour market since the middle of the 1990s. Moreover, the decline in NAIRU and the increase in participation will be further supported by the permanent labour market measures taken during the crisis, mainly labour tax cuts with the effect of increasing the financial incentives to work. In the meantime and as an offsetting force, the working age population (20-64) will experience a clear declining pattern due to the population ageing. As a result, employment growth should be close to zero by 2020 and the employment rate – over the population aged 20-64 – only reaches 71½% in the 2020.

**As a result, potential productivity growth, which fell significantly during the crisis because of the level of labour hoarding, increases very slowly to reach 2% in 2020 in the baseline scenario.** Henceforth, productivity becomes the sole driver of growth, as recalled by the 2009 Ageing Report. The projection of productivity growth also assumes that the New Member States will continue to catch up with the EU15.

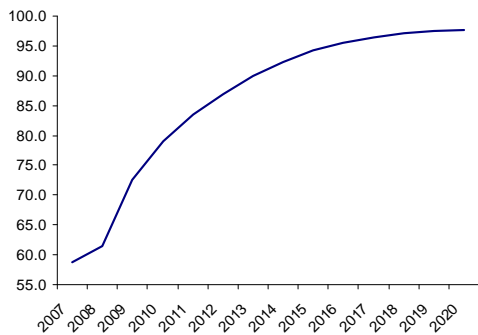


Graph 3: Baseline scenario - structural (un)employment rate



The baseline scenario also contains macroeconomic effects of fiscal adjustment of 0.5% of GDP every year until the Medium Term Objective (MTO) is reached, which is the minimum speed of consolidation requested by the Stability and Growth Pact (SGP). In practise this means that the budget deficit is cut by an additional 0.5% of GDP every year so as to ensure gradual convergence to the level of deficit or surplus recommended in the MTO. The implied evolution of the debt-to-GDP ratio is explained in detail in the Autumn 2009 forecast.<sup>(8)</sup> It should be noted that this adjustment is by far insufficient to reduce the debt-to-GDP ratio on average. This speed of consolidation would only slow down the pace of increases in public debt and lead to its stabilisation at around 100% of GDP in the EU by 2020.

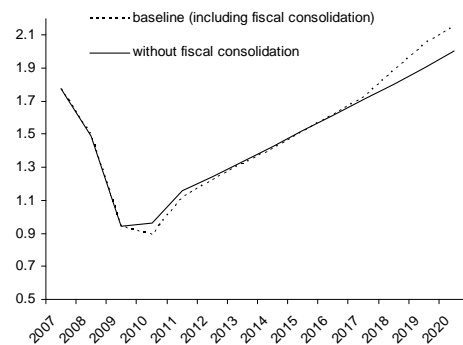
Graph 4: Baseline scenario - public debt (% GDP)



<sup>(8)</sup> "Government debt: past and future challenges", Chapter 3 in "European Economic Forecast – Autumn 2009" European Economy n°10.

As expected, this fiscal adjustment would have a contractionary effect in the short-run via the reduction in domestic demand but would lead to a modest positive impact on GDP by 2020. When using the Quest III multipliers of GDP to fiscal deficit, as presented in detail in the European Commission (2010), the GDP growth in the baseline is not dramatically altered in 2020 by the impact of the gradual consolidation on output: the cumulated impact in 2020 appears positive albeit of the second-order (+0.05p.p.). In the short term, the output growth movement are more acute, as shown in Graph 5: GDP growth is lower in the immediate aftermath of the crisis but rebounds more strongly by the end of the decade.<sup>(9)</sup>

Graph 5: Impact of fiscal adjustment of 0.5% annually on cyclically-adjusted GDP growth



The uneven impact of fiscal consolidation over time results from the favourable effects which will gradually materialise in the second half of

<sup>(9)</sup> The impact of consolidation on GDP is included in the baseline in the following fashion. First, we use the dynamic multipliers of GDP to a permanent reduction of the public deficits of 1% GDP, based on the QUEST simulation of fiscal consolidation with sovereign risk premia. The latter is presented in the Chapter 6 of the report Public Finances in EMU 2010 "Simulations of the output effect of fiscal consolidations". Such a decline in the public deficit leads to a contraction in GDP of around 0.4% the first year of the implementation, no impact on GDP in 2016 and a slight positive increase in GDP in 2020 (+0.1%). Second, the baseline scenario then assumes a gradual phasing-in of the consolidation (i.e. cumulative fiscal adjustment of 0.5% of GDP every year) until 2018, when the Medium Term Objectives (MTO) are reached in some Member States, which is broadly consistent with the mechanical projection of public debt in 2020 in the Autumn 2009 forecast document. Third, to enhance consistency further, the final results in terms of GDP effect, are slightly rescaled to obtain a cut in public debt of 15 p.p. of GDP by 2020, which is strictly equivalent to outcome of the Autumn 2009 forecast exercise.

**the decade.** Two positive economic effects are at play. First, the cut in interest payment on public debt reduces the need to make recourse to distortionary taxes. As the government deficit is permanently reduced, the stock of outstanding debt gradually declines, and the costs of servicing this debt also fall. This creates additional fiscal space to gradually reduce labour income taxes, offsetting the initial increase in taxes that was part of the consolidation package. Second, the decline in public debt lowers the sovereign risk premium, calibrated such that a 1 percentage point reduction in the debt to GDP ratio reduces government bond rates by 3 basis points, which is in line with the estimates reported in Laubach (2009). The further decrease in debt servicing generated by the cut in sovereign risk premium yields additional fiscal room for reducing the distortionary taxes. Empirically, Reinhart and Rogoff (2010) show that the negative relationship between government debt and real GDP growth is fairly strong for debt-to-GDP ratios above a threshold of 90% of GDP. The effect of consolidation would be even stronger if we assume a decline in the risk premium on corporate bonds and the alleviation of the crowding-out effect via the increase in private savings. However, the literature, surveyed by Gale and Orszag (2003) appears much less certain about the empirical importance of these two channels compared with the impact of distortionary taxes and the risk premium on sovereign bonds.

### 3.2 Reform scenarios

**To demonstrate the broad benefits of Europe 2020 actions, several additional reform scenarios were built.** The objective was that the scenarios are illustrative but realistic mixtures of reforms in different policy areas. Therefore, they differ in their breadth (some consider a narrower range of reforms than others) as well as the depth of reforms (the degree of progress varies across scenarios). The scenarios are built as linear combinations of the specific reform simulations with the QUEST III model. Adding the gains of different reforms is justified by the broadly linear nature of the results of simulations with the QUEST III model. On the other hand, the results can miss additional synergies between reform measures.

As regards structural reforms contained in the scenarios, they combine two types of assumptions on the degree of progress made:

- reducing some part of the gap between EU average performance and three best performing EU countries; and
- achieving (or making some progress towards) existing targets/benchmarks.

#### Reducing gaps towards best performers

**The simulations generally assume that the EU, on average, makes some progress on closing the gap in specific policy areas towards the three best EU performers (see Table 2).** While an assumption of the degree of progress is to some extent arbitrary, it allows a differentiation of potential gains depending on the policy effort: the low effort scenarios generally assume a reduction of the gap by 1/10, medium-effort assume a reduction by 1/3 and the high effort scenarios assume a reduction by 1/2. This, for example, means that in the medium-effort scenario it is assumed that product market reforms aimed at increasing the degree of competition succeed in reducing mark-ups in the final good sector in EU27 from around 24.2% by 1/3 of the overall gap with the average of three EU countries with the lowest levels of mark-ups (approximately 15.8%). This entails a drop in the final goods sector mark-up by 2.1 percentage points to 22.1%. In the advanced-effort scenarios, the reduction would be 4.2 percentage points (1/2 of the performance gap). To provide a better idea of the size of the shocks, Table 2 and Graph 6 show the size of the gaps between the EU27 and the average of the 3 best performing EU countries for the relevant policy variables. <sup>(10)</sup> The gap in the policy variables is

<sup>(10)</sup> For most of the variables, the averages of 3 best performing countries are derived from the data underlying the country-specific QUEST III models (see D'Auria et al., 2009). For public education spending, we use Eurostat data. In the case of the long-run unemployment benefit replacement rate, OECD data is used as the QUEST III model assumes identical rates for all old member states (40%) and new member states (30%). As the average replacement rate of the EU countries that are OECD members is higher, around 52%, the shock was scaled down appropriately. In policy terms, it is in essentially the long-run replacement rates that should be a concern of reforms to make work pay. The QUEST III model contains only one replacement rate which can be broadly understood as an average of short- and long-run rates and, therefore, the shock was further

**Table 2:**  
**Levels of policy variables in EU27 and gaps with US and 3 best EU performers**

	Levels of policy variables			Performance gaps with		MEMO: Past developments in relevant variables	
	average 3			3 best in EU	MEMO: US	Period	Change
	EU27	best EU	MEMO: US				
Fixed entry costs in intermediate goods market (% of GDP per capita) <sup>1</sup>	38	7.3	2	<b>30.7</b>	36	04-10	-46% <sup>2</sup>
Risk premium on intangible capital <sup>3</sup>	2.5	0.6	1.6	<b>1.9</b>	0.9	n.a.	n.a.
Public spending on R&D (% GDP) <sup>4</sup>	0.6	0.8	0.7	<b>0.7</b>	0.1	00-07	+0.0 p.p.
Public spending on education (% GDP) <sup>4</sup>	5.0	7.3	5.5	<b>2.2</b>	0.5	00-07	+0.1 p.p.
Final goods market mark-up <sup>3</sup>	24.2	15.8	20.5	<b>8.4</b>	3.7	early 90s -99	+7 p.p. <sup>5</sup>
Benefit replacement rate (after 5 years) <sup>6</sup>	52.1	38.2	24.1	<b>13.9</b>	28.0	01-07	-3.3 p.p.
Labour taxes <sup>7</sup>	38.6	26.7	29.0	<b>11.9</b>	9.6	00-08	-0.4 p.p. <sup>8</sup>

Notes and sources: (1) Values based on Djankov et al. (2002); (2) Computed on the basis of World Bank Doing Business data for years 2004 and 2010, applying the Djankov et al. approach; (3) Based on country variants of the QUEST III model; (4) Eurostat; (5) Mark-ups in the services sector (roughly equivalent to the final goods sector in QUEST) reported in Badinger (2007); (6) OECD data, IT and GR excluded; (7) Simulations on tax shifts are based on the gaps in the labour tax rates across the EU; (8) Computed on the basis of implicit tax rate on labour. Note that the increases in public R&D spending are arbitrarily calibrated in the scenarios.

reduced gradually within a period of 5 years, which captures the gradual implementation of growth-enhancing policies. Moreover, the impact on growth comes into effect only progressively and become visible only after several years.

**In some cases, these assumptions entail very substantial policy reforms. Especially, the assumption of closing ½ of the performance gap in the highest efforts scenarios is very ambitious and consequently the results need to be seen as an upper bound on potential gains from reforms.** To achieve such reform progress would require very substantial changes in various market institutions as well as the composition and quality of public revenues/expenditures. There would have to be a clear departure from the past policies and a strong political commitment and consensus on the need for change. Nevertheless, the degree of policy effort which these scenarios imply is technically (as opposed to politically) feasible. Graph 6 shows that, in several cases, the new policy settings in the most advanced reform scenario would be close to the current US level (e.g. mark-ups in final goods sector or risk premia on intangible capital). Public spending on education would even somewhat exceed that in the US but it needs to be borne in mind that the overall education spending would still be considerably higher in the US thanks to a very high share of financing from private sources.

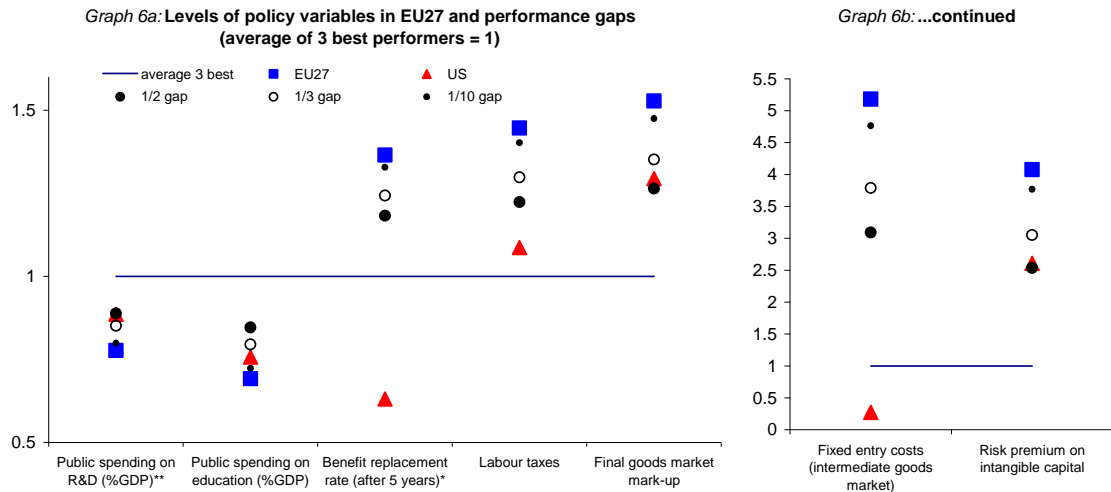
On the other hand, policy settings as regards, for example, conditions for market entry or (long-run) unemployment benefit replacement rates would remain more restrictive in the EU compared to the US.

**Therefore, the assumption of closing ½ of the gap with three best EU performers appears as an appropriate maximum for the most ambitious scenario.** Further reductions along the considered policy dimensions would probably be unrealistic. For the EU as a whole, it would imply a convergence to a model with very flexible product markets like in the UK, very low benefit replacement rates like in Slovakia, very low labour taxes like in Ireland, and high expenditures on R&D and education like in Sweden or Finland. In addition, it might not always be optimal for countries to strive for such a convergence as this could clash with other objectives of Europe 2020 such as social cohesion. <sup>(1)</sup>

**The policy shocks implied by these assumptions also seem broadly achievable in historical comparison.** As Table 2 documents, developments in some of the relevant policy variable indicate that the reform efforts necessary to partially close the performance gaps have been witnessed in the past,

<sup>(1)</sup> This is also a reason why the simulations on reductions in the unemployment benefit replacement rates focus on the long-run rate, which plays a key role in determining job-search intensity, and not the short-run rate, which rather reflects the extent to which dismissed workers are supported in the periods of job transitions.

scaled down by a factor of 0.62 which corresponds to the share of long-run unemployed (over 6 months).



especially if one considers a reduction in the gap by  $\frac{1}{4}$ .<sup>(12)</sup> For example, the average unemployment benefit replacement rate after 5 years in the 19 EU countries that are OECD members decreased by 3.3 p.p. between 2001 and 2007. The  $\frac{1}{4}$  reduction in the gap with three EU countries with the lowest values implies a comparable reduction by 3.5 p.p.. Similarly, EU countries have recorded very significant reductions in the cost of entry into market (by around 50% since 2004), which together with the fact that the entry costs are still relatively high in a number of member States makes the assumed reductions of up to 15% feasible. On the other hand, (public) spending on education has not increased substantially over past and future increases would clearly need to reflect a political decision on (re)allocation available budgetary resources. Similarly, the reductions in the tax burden on labour (measured as implicit tax rate on labour) have been limited over the past decade and shifting some of the tax burden from labour to consumption (while leaving the overall tax burden constant) would need to rest on a decision of policy-makers (and come as part of a wider reform package aimed at ensuring sustainability of public finances).

**As regards mark-ups in the final goods sector, the past evidence is more mixed but indicates that the implied reductions, while very**

**significant, might not be overly excessive.** For example, Badinger (2007) estimated that mark ups in the services sector increased from 30% to 37% in the course of 90s, which points to important obstacles to competition in this sector (which is roughly equivalent to the final goods sector in the QUEST III model). At the same time, he estimated that mark-ups in the manufacturing sector in 10 EU Member States dropped from 38% to 28% since the early 1990s, which may possibly be linked to the increased level of competition as a result of the establishment of the Single Market. These results thus point to a strong potential of policies increasing the level of competition in product markets. In similar vein, Breuss and Badinger (2006) apply a partial equilibrium econometric approach to estimate the potential effects of the Services Directive and they find that it could reduce the average mark-ups in the sectors concerned by approximately 3.75 p.p.. Also other studies report high levels of mark-ups in a number of European industries, especially in the services sector, and underline that there is a significant room for their reduction (see for example, Christopoulou and Vermeulen (2008)). For France, Bouis (2007) reports a decline in average mark-ups in the market sector (without agriculture) in the period 1982-2002, which nevertheless masks increases in some sectors (e.g. retail trade).

**Making progress towards existing targets/benchmarks**

**Wherever possible, the scenarios attempt to demonstrate the macroeconomic effects of**

<sup>(12)</sup> Note that such evidence is not available for some of the policy variables, e.g. risk premia on intangible capital are not directly observable and were calibrated in the QUEST model.

**meeting existing policy targets/benchmarks or making some progress towards them.** In particular, the most ambitious reform scenario simulates effects of reaching two of the Europe 2020 headline targets – it assumes that the employment rate of the age group 20-64 reaches 75% and overall R&D expenditures surpass 3% of GDP. In both cases, this is achieved through a mixture of policies. In the case of the employment target, tax-benefit reforms, which are defined on the basis of reducing the gap vis-à-vis the best performers in the EU, are complemented with some wage moderation, possibly a result of adjustments in wage-setting mechanisms. The extent of wage moderation is calibrated in such a way so as to meet the employment target. In the case of R&D target, the focus is on public R&D expenditures as private expenditures cannot be directly influenced by the government. The advanced reform scenario thus assumes that public R&D expenditures would rise to 1% of GDP, which is 1/3 of the overall target and a benchmark set under the Lisbon strategy for Growth and Jobs. As regards specific tools to boost R&D spending, all the scenarios assume a more or less balanced mixture of tax credits and wage subsidies for R&D personnel because both instruments are used by Member States. This together with other measures to stimulate R&D, e.g. better access to finance and venture capital or better framework conditions, bring the overall R&D spending to the EU level target value. The simulations also consider some reductions in administrative burdens (overhead costs). These reductions are arbitrarily set: the limited/medium effort scenarios assume reductions in the overall administrative burden by around 10%, while the high effort reform scenarios by 20%.<sup>(13)</sup>

The following scenarios were built:

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<sup>(13)</sup> There are no reliable estimates of the extent of administrative burden and the scope for its reductions available. In January 2007, the Commission adopted an action programme aimed at reducing administrative burdens on businesses in the EU by 25% in 2012 (COM(2007)23). The EU and Member States have made some progress towards this benchmark though it difficult to devise a quantitative measure. The scenarios therefore assume that these efforts will be continued under Europe 2020 strategy and that it will be possible to reduce administrative burden by up to 20% between 2011 and 2020 (which partially overlaps with the original commitment).

- **Ambitious fiscal consolidation (Scenario 0):** a fiscal policy scenario which considers a stronger fiscal consolidation of 1% of GDP annually until the MTO are reached (i.e. 0.5 p.p. more than in the baseline). The debt projection under this scenario is explained in detail in the Autumn 2009 forecast document. <sup>(14)</sup> The positive feedback loop of the fiscal consolidation on GDP and employment appears fairly modest and is explicitly taken into account here, based on a QUEST simulation. This negligible effect on output and employment is explained by its time profile. In the short term, consolidation will have a contractionary impact via the sharp drop in domestic demand, while the positive effects will materialise in the second half of the decade. The consolidation is gradually phased-in with cumulative fiscal adjustment of 1% of GDP every year until the year of 2018, when the Medium Term Objectives (MTO) are already reached in some Member States.
- **Limited "costless" reform (Scenario 1):** this scenario presents a very bleak picture as regards reform progress. It assumes that, due to the constrained budgetary resources, attempts at pursuing structural reform are very uneven across Member States and there is generally non-existent support for far-reaching measures. Consequently, reform efforts embedded in the scenario focus on measures with no budgetary costs (e.g. increasing competition, reducing administrative burden or limited budget-neutral tax reforms) which generally succeed in closing 1/10 of the gaps with EU best performers.
- **Limited reform (Scenario 2):** this scenario is an extension of scenario 1. In addition to the reforms with no budgetary costs it assumes that EU countries manage to mobilise some, albeit relatively modest, resources to increase knowledge-oriented expenditures, i.e. R&D and education. It is probably more realistic than the Scenario 1 and demonstrates that a piecemeal and shallow reform would not bring the EU any near to meeting the Europe 2020 vision.

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<sup>(14)</sup> "Government debt: past and future challenges", Chapter 3 in "European Economic Forecast –Autumn 2009" European Economy n°10."



- **Medium reform (Scenario 3):** this scenario assumes that reforms have gained momentum across most of the EU and progress will be achieved across all the policy areas. It assumes non-negligible increases in knowledge-oriented expenditures (public expenditures on R&D and education roughly reaching the current US levels) as well as important reforms in product and labour markets (generally closing 1/3 of the gaps with the best EU performers). It should nevertheless be noted that the EU would still be short of meeting some of the headline targets.
- **Advanced "costless" reform (scenario 4):** this is a less ambitious variant of the advanced reform scenario 5, which attempts to demonstrate the impact of far-reaching reforms in product and labour markets but keeps the productive expenditures such as R&D or education spending at the current level due to the need for significant consolidation of public finances. Like scenario 5, it generally assumes ½ reductions in the gaps and an ambitious reduction in administrative burdens by 20% and a drop in the risk premia on (tangible) capital by 50 bp. compared to the baseline.
- **Advanced reform (scenario 5):** this scenario assumes very advanced reforms across the board and should probably be seen as an upper bound for the potential gains. It generally assumes a ½ reduction in the performance gaps with the three best performers which, for example, means reducing the mark-ups or the risk premia on intangible capital to the US levels. The scenario also assumes significant progress in further cutting red tape (by 20%) and labour market reforms that boost competitiveness through wage moderation (on average implying reduction in real wages by around 1%). These very intensive reform efforts coupled with increases in public R&D (reaching 1% of GDP) and education spending (by 1.1% of GDP reaching roughly 6.5%) would generate substantial economic benefits and help meet the EU employment target of 75% and increase overall R&D spending substantially to around 3%. This scenario also assumes that the significant progress with fiscal consolidation and structural reforms will have a positive impact on confidence in the markets

and gradually bring down the risk premia on (tangible) capital by 50 bp. compared to the baseline.

**The full description of the scenarios is in Table 3.** These overall scenarios show possible implications of limited/average/good progress in reform across the board. Different elements of the scenarios, i.e. in the areas of labour markets, product markets or knowledge and innovation, can easily be combined to construct new scenarios. For example, one could imagine a scenario with dismal progress in the labour markets but a relatively good progress in product markets. In the presentation of the results of the structural reform scenarios, the focus is on the limited, medium and advanced reform scenarios, i.e. scenarios 2, 3 and 5. The results of the "costless" reform scenarios 1 and 4 are, nevertheless, useful to demonstrate that policies also need to prioritise knowledge expenditure increases to stimulate long-run growth.

**Table 3:**

**The specification of different scenarios**

	Knowledge and innovation	Product markets	Labour markets
<b>Scenario 1: Limited "costless" reform</b>	<ul style="list-style-type: none"> <li>Reduce risk premia on intangible capital (1/10 gap)</li> <li>Reduce entry costs (1/10 gap)</li> </ul>	<ul style="list-style-type: none"> <li>Reduce mark-ups (1/10 gap)</li> <li>Reduce administrative burden by 10%</li> </ul>	<ul style="list-style-type: none"> <li>Tax shift from labour to VAT and tax shift to high-skilled labour (1/10 gap)</li> <li>Wage moderation (on average around 0.2% drop in real wages)</li> </ul>
<b>Scenario 2: Limited reform</b>	<ul style="list-style-type: none"> <li>Increase public R&amp;D by 0.1% GDP (reaching current US level) through mix of wage subsidies and tax credits</li> <li>Increase public education spending (1/10 gap)</li> <li>Reduce risk premia on intangible capital (1/10 gap)</li> <li>Reduce entry costs (1/10 gap)</li> </ul>	<ul style="list-style-type: none"> <li>Reduce mark-ups (1/10 gap)</li> <li>Reduce administrative burden by 10%</li> </ul>	<ul style="list-style-type: none"> <li>Tax shift from labour to VAT (1/10 gap)</li> <li>Tax shift to high-skilled labour (1/10 gap)</li> <li>Wage moderation (on average around 0.2% drop in real wages)</li> </ul>
<b>Scenario 3: Medium reform</b>	<ul style="list-style-type: none"> <li>Increase public R&amp;D by 0.1% GDP (reaching current US level) through mix of wage subsidies and tax credits</li> <li>Increase public education spending (1/3 gap)</li> <li>Reduce risk premia on intangible capital (1/3 gap)</li> <li>Reduce entry costs (1/4 gap)</li> </ul>	<ul style="list-style-type: none"> <li>Reduce mark-ups (1/3 gap)</li> <li>Reduce administrative burden by 10%</li> </ul>	<ul style="list-style-type: none"> <li>Tax shift from labour to VAT and tax shift to high-skilled labour (1/3 gap)</li> <li>Wage moderation (on average around 0.2% drop in real wages)</li> <li>Reduce benefit replacement rate (1/3 gap)</li> </ul>
<b>Scenario 4: Advanced "costless" reform</b>	<ul style="list-style-type: none"> <li>Reduce risk premia on intangible capital (1/2 gap)</li> <li>Reduce entry costs (1/2 gap)</li> </ul>	<ul style="list-style-type: none"> <li>Reduce mark-ups (1/2 gap)</li> <li>Reduce administrative burden by 20%</li> <li>Reduce risk premia on tangible capital by 50 bp.</li> </ul>	<ul style="list-style-type: none"> <li>Tax shift from labour to VAT and tax shift to high-skilled labour (1/2 gap)</li> <li>Wage moderation (on average around 0.7% drop in real wages)</li> <li>Reduce benefit replacement rate (1/2 gap)</li> </ul>
<b>Scenario 5: Advanced reform</b>	<ul style="list-style-type: none"> <li>Increase public R&amp;D spending to 1% of GDP (through mix of wage subsidies and tax credits)</li> <li>Increase public education spending (1/2 gap)</li> <li>Reduce risk premia on intangible capital (1/2 gap)</li> <li>Reduce entry costs (1/2 gap)</li> </ul>	<ul style="list-style-type: none"> <li>Reduce mark-ups (1/2 gap)</li> <li>Reduce administrative burden by 20%</li> <li>Reduce risk premia on tangible capital by 50 bp.</li> </ul>	<ul style="list-style-type: none"> <li>Tax shift from labour to VAT and tax shift to high-skilled labour (1/2 gap)</li> <li>Wage moderation (on average around 0.7% drop in real wages)</li> <li>Reduce benefit replacement rate (1/2 gap)</li> </ul>

**The structural reform scenarios take into account the fact that some policy reforms take certain time to be implemented and generally assume that reforms are phased in over a period of several years.** They assume that once the detailed design of the Europe 2020 strategy is completed in 2010 policy measures start being implemented in 2011. However, due to policy and

implementation lags, most of the reform measures are likely to be phased in only gradually. It is often the case that reforms are implemented in steps to smooth the adjustment to the new status quo and improve their acceptability. Also, costly reforms will have to be implemented only slowly in the context of severely constrained public finances and given the urgent need for fiscal consolidation in

the vast majority of EU countries. For example, significant and immediate jumps in knowledge-related expenditures are extremely unlikely and it is much closer to reality to assume only very gradual increases. In fact, a fairly ambitious objective for the first years of the strategy might be to prevent drops in these types of productive expenditures. Finally, the effects of some reform measures materialise only gradually which needs to be taken into account when modelling their effects. For example, it is probable that the measures to increase competition in product markets (especially services) will take some time to translate into lower mark-ups, i.e. the policy variable used in the simulations. <sup>(15)</sup> On the other hand, one could argue some regulatory reforms such as reductions in administrative burden or adjustments in labour market regulation, which essentially depend on an adoption of a legal act start to work immediately (legal acts frequently foresee that these changes are introduced in smaller steps, making their impact gradual). <sup>(16)</sup>

**To cater for the step-wise nature of reform implementation and the implementation lags, the main results assume that the reforms will be phased in gradually over a period of 5 years.**

This appears a realistic time span to provide for a smooth but, at the same time, reasonably ambitious implementation timetable which would also allow the reforms to start delivering their benefits. To assess the robustness of these results, several alternative assumptions on the phasing in have been tested. To consider even slower phasing in of reforms, the results also present figures based on a 10-year gradual introduction of shocks, i.e. reforms fully implemented only in 2020. On the other hand, the results also contain a set of effects of reforms introduced in a "big bang" manner, which could be seen as a ceiling of the range of possible results. Finally, a set of figures based on differentiated phasing in assumptions across policy reforms is presented. These results add another layer of realism by making it possible to assess the effects of a reform strategy that needs to prioritise in the first years measures with no/low budgetary costs, capable of delivering relatively benefits already in the short- to middle-run.

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<sup>(15)</sup> This needs to be distinguished from the dynamic general equilibrium effects that are fully embedded in the model.

<sup>(16)</sup> The transition dynamics through which the economy adjusts to these abrupt changes in structural settings is embedded in the model.

**However, these results need to be treated with caution and should primarily be looked at in relative terms, rather than taking at face value the level effects.** In particular, the QUEST III model does not consider upfront costs associated with some of the reform measures explored in this paper. This could bias their short- to medium-run output effects upwards and alter their time profile. For example, reductions in administrative burden can come through introducing e-government projects which imply relatively important costs of setting up the necessary infrastructure. In addition, the simulations of increases in education spending do not have a feedback to public finances, which also biases the overall effects upwards.

**In terms of political economy, the long-term gains of reforms may not be enough to buy full support of the public given the existence of long policy lags and the uneven distribution of the gain in the society.** Some reforms may entail economic losses in the short term. In any case, many of them produce visible effects after some time. Moreover, some groups may be hit by the reforms and bear the brunt of the adjustment, despite global gain for the society.

#### 4. RESULTS OF THE SCENARIOS

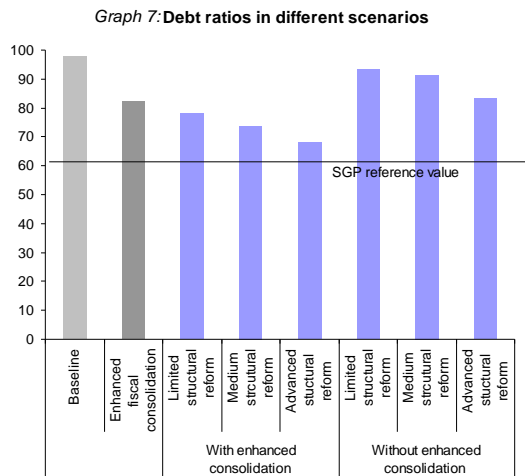
**The results present the impact of different scenarios on the main macroeconomic, labour market and public finance variables.** <sup>(17)</sup> The main focus is on the effects of the scenarios in 2020, in line with the lifetime of the Europe 2020 strategy. The long-run effects of structural reforms would naturally be higher given the sometimes very long time before full benefits of specific reform measures materialise. The geographical coverage of the exercise is the EU27 as a whole.

**The results of the "ambitious fiscal consolidation" scenario clearly show that a fiscal consolidation going beyond the minimum requirement prescribed by the SGP is crucial to rein in the increases in public debt, which would approach 100% of GDP by 2020 in the baseline scenario.** While extra annual consolidation of 0.5% of GDP will reduce public debt by more than 15 p.p. of GDP compared with the baseline, which already contains annual

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<sup>(17)</sup> Most of the variables correspond to cyclically-adjusted concept, i.e. capturing the trend.

consolidation of 0.5% of GDP, it will remain insufficient to bring public debt in the vicinity of the SGP reference value of 60% of GDP in 2020. Although more ambitious fiscal consolidation negatively affects GDP growth in the short run, in the medium run it will generate higher growth and it will even bring about a slight increase in GDP by 2020, raising the employment rate by 0.4 p.p. compared with the baseline. The contraction in domestic demand caused by fiscal consolidation in the short term will be more than offset by the reduction of debt servicing and by more favourable expectations of investors and consumers about future developments in the tax burden.



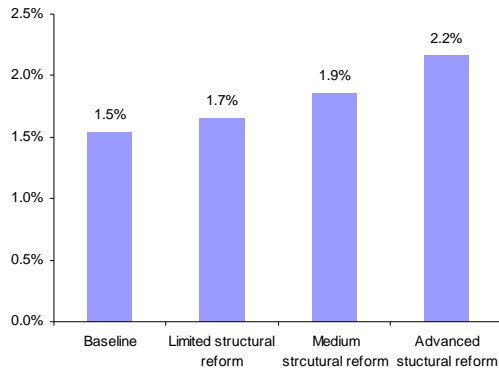
**These results thus emphasise that it is crucial that consolidation efforts are accompanied by growth-oriented structural reforms in order to sustain fiscal consolidation and return debt levels to a declining path.** These are essential to improve the capacity of the European economy to generate the rates of growth needed to support fiscal consolidation measures in bringing down the debt-to-GDP ratios. A fundamental growth weakness could lead the most vulnerable EU economies into a "debt trap", where debt levels as a share of GDP continue to increase despite strong budgetary consolidation efforts.

**The structural reform scenarios demonstrate that progress in implementing structural reforms under the main priority areas of EU2020 can generate significant gains in terms of increasing output and creating jobs (see Table 4).** By 2020, GDP could increase from around 1½% in the limited structural reform

scenario up to 7% in the advanced reform scenario compared to the baseline thanks to the implementation of reform policies. Structural reforms thus could help boost annual growth between 2010 and 2020 from 1.7% in the limited reform scenario up to 2.2% in the ambitious reform scenario, to be compared with 1.5% in the baseline (Graph 8). Employment gains would also be considerable: between around 1% and 4½%, which means creating additional 1.5 to almost 10.8 million jobs. The advanced structural reform scenario would imply that the employment rate of those aged 20-64 would rise to 75% - the target set by Europe 2020. At the same time, progress with structural reforms would have a positive impact on the unemployment rate which could drop by between 1 to around 5 percentage points. This would mean the unemployment rate would lie between around 3 (ambitious reform scenario) and 7½ (limited reform scenario) (Graph 9). The important progress in the area of knowledge and innovation would also help achieve the R&D expenditure headline target of 3% of GDP in the advanced reform scenario on account of increased public spending (to around 1% of GDP) and improved framework conditions. The positive growth effects of reforms have a considerable beneficial impact on public finances and would support the necessary fiscal consolidation. Through the expansion in tax bases and increased tax collection, governments find it much easier to consolidate and find resources for further growth enhancing reforms in the future. By increasing both GDP and tax revenues, these reforms thus contribute to reducing the burden of public debt as a percentage of GDP, by between 2½ p.p. and 15 p.p..<sup>(18)</sup> However, even in the most optimistic scenario, the debt levels would remain well above the 60% reference value embedded in the SGP. Also note that without enhanced fiscal consolidation in the debt-to-GDP ratios would stay at very high levels which could potentially harm the long-run growth prospects through, for example, increases in risk premia or distortionary taxes or the crowding out of productive public spending by debt servicing (these effects are not fully taken into account in the simulations).

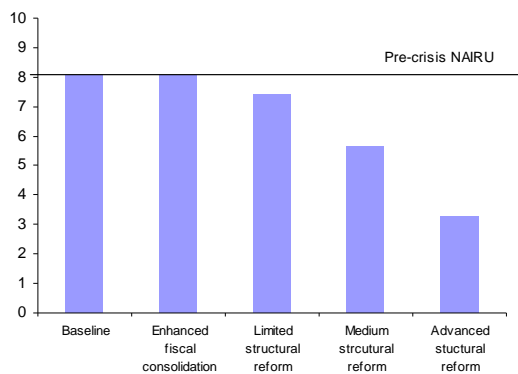
<sup>(18)</sup> The advanced "costless" reform scenario (Scenario 4) would imply even greater drop in the debt ratio. However, this would be clearly unrealistic as the future growth would be undermined due to insufficient productivity enhancing expenditures.

Graph 8: Average GDP growth (2009-2020)



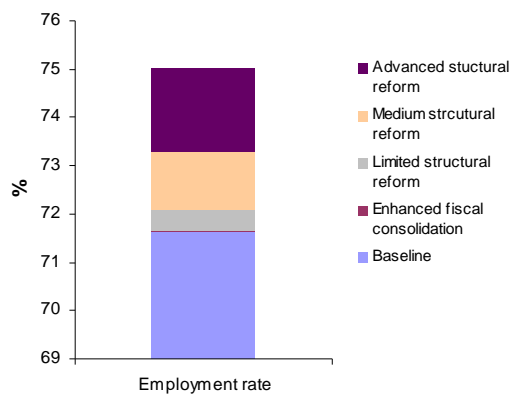
Note: Structural reform scenarios contain enhanced fiscal consolidation (1% of GDP annually)

Graph 9: Unemployment rate



Note: Structural reform scenarios contain enhanced fiscal consolidation (1% of GDP annually)

Graph 10: Effect of reform scenarios on employment rate

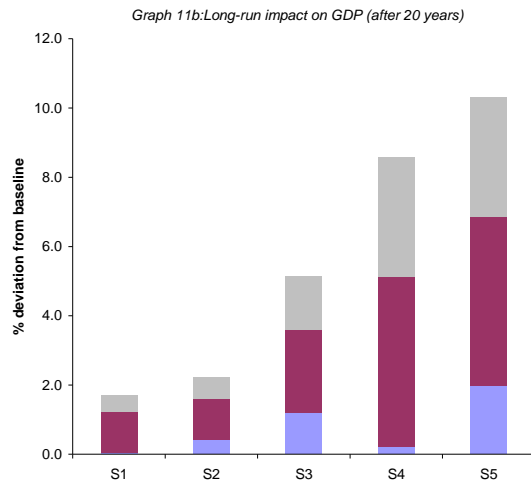
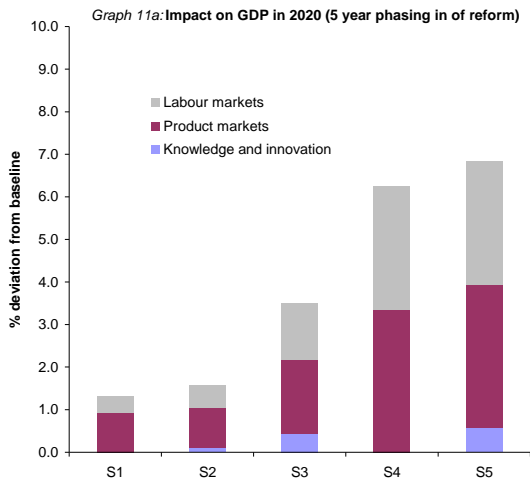


**The wide range of these results underlines the importance of a comprehensive approach in order to make substantial progress with reform**

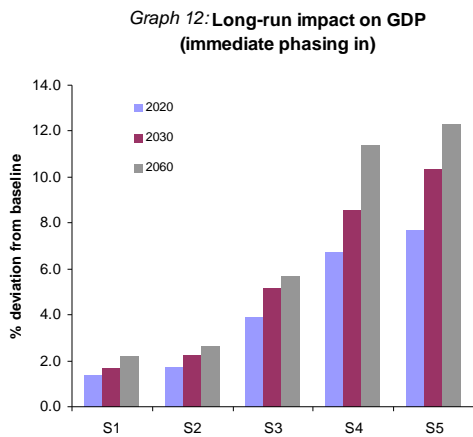
**along all the policy agendas.** It should be noted that the advanced reform scenario would require a significant departure from the past policies and a strong political commitment and consensus on the need for change. This is indispensable, however, as the economic benefits from partial and or insufficiently deep reform generate only limited gains and would not succeed in realising the Europe 2020 ambition. For example, the medium reform scenario embeds reasonably ambitious assumptions on reform progress across the major policy areas, requiring considerable political commitment, which would nevertheless be insufficient to achieve the Europe 2020 headline targets for employment and R&D. This scenario would imply an increase in output by around 3½% compared to the baseline, which translates into a rise in the average growth over the period 2009-2020 from 1.5% in the baseline scenario to 1.9%. Employment gains of close to 2½% (approximately 5.3 million new jobs)<sup>(19)</sup> would, however fail to bring the employment rate of those aged 20-64 to the desired 75% by a margin of around 1½ percentage points (see graph 10). Policies to promote R&D and innovation (substantial increases in public spending to ¾% of GDP and improvements in framework conditions for innovation) would help increase R&D intensity to around 2.4% - short of the 3% headline target.

**In the longer run, the effects of structural reform packages would be considerably higher. Due to the inevitable adjustment to the new structural settings, only a part of benefits from reform policies would materialise by 2020.** Graph 11 shows that long-run gains from reforms in different scenario would be approximately 1/3 bigger 20 years after the implementation of the shock and around ½ bigger 50 years, as the

<sup>(19)</sup> Some econometric evidence, based on the historical pattern of employment, seem to suggest that the economic gains – in terms of employment rise - brought about by structural reforms in the medium reform scenario are "realistic", that is, commensurate with the estimated gains of past reform episodes. In the euro area, 0.7 percentage point of the annual employment growth between 1997 and 2001 and 0.65 of a percentage point between 1997 and 2005 were not explained by the traditional determinants (i.e. GDP growth and labour costs). This would roughly amount to an additional increase of employment by around 6% over a period of 10 years. Part of this extra growth may be attributed to the strand of structural reforms carried from the mid-1990s. See Moure (2006) and European Commission (2006).



economy gradually adjusts and the new steady-state growth path is achieved.



Not surprisingly, it is in particular measures to stimulate knowledge and innovative activities that require a longer time to deliver their full benefits (see scenarios 1 and 4 in Graph 12). Therefore, it is important that there is sufficient emphasis on measures to support knowledge creation and utilisation, including ring fencing of R&D and education expenditures in the initial phases of budgetary consolidation and their increases in the future. It is only policies that stimulate drivers of endogenous growth that can shift the long-run growth rate of the European economy upwards. Most of the other policy measures in labour and product markets promise more immediate pay-offs, which are substantial but lead to level increases in output without affecting the long-run growth rate.

**The long-run economic gains from these reform scenarios are broadly in line with other modelling exercises.** For example, Bayoumi et al. (2004) predicted that increasing competition in the euro area to the US level could boost output by 12.4%. Similarly, Eveaert and Schule (2006) modelled the effects of labour and product market reforms, assuming convergence to mark-ups in Sweden, Denmark and UK. The authors find long-run output impacts of 10% to 16%. Coenen et al. (2007) show that reducing tax distortions in the euro area tax systems by lowering the tax wedge to the levels prevailing in the US would considerably boost labour supply and raise output by more than 10%.

Clearly, the results of this exercise are surrounded by a great deal of uncertainty, a large part of which is related to the short-term economic fluctuations around the projected trends in the different scenarios. If the recovery from the crisis turns out to be sluggish and growth falls below what is projected in the baseline scenario, meeting the ambitious reform scenario would be more difficult. Conversely, it would become more attainable in the case of a swift economic pickup.

Table 4:

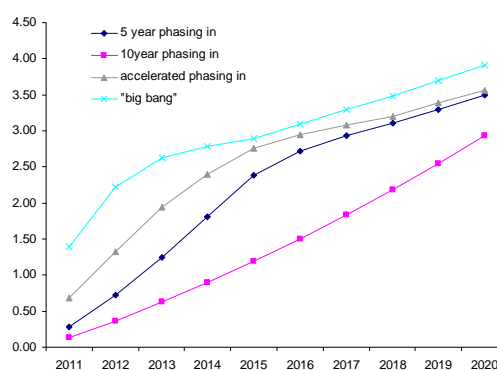
**Macroeconomic effects of structural reform scenarios**

		Phasing in over 5 years				
		S1	S2	S3	S4	S5
GDP	Knowledge and innovation	0.0	0.1	0.4	-0.1	0.6
	Product markets	0.9	0.9	1.7	3.3	3.3
	Labour markets	0.4	0.5	1.3	2.9	2.9
	<b>SUM</b>	<b>1.3</b>	<b>1.6</b>	<b>3.5</b>	<b>6.2</b>	<b>6.8</b>
Employment	Knowledge and innovation	0.0	0.0	0.1	0.1	0.1
	Product markets	-0.1	-0.1	0.1	0.1	0.1
	Labour markets	0.6	0.9	2.1	4.3	4.3
	<b>SUM</b>	<b>0.6</b>	<b>0.9</b>	<b>2.3</b>	<b>4.5</b>	<b>4.6</b>
Unemployment rate	Knowledge and innovation	0.0	0.0	-0.1	-0.1	-0.1
	Product markets	0.0	0.0	-0.1	-0.1	-0.1
	Labour markets	-0.7	-1.1	-2.3	-4.6	-4.6
	<b>SUM</b>	<b>-0.6</b>	<b>-1.0</b>	<b>-2.4</b>	<b>-4.7</b>	<b>-4.8</b>
Current account (% of GDP)	Knowledge and innovation	-0.1	-0.2	-0.4	-0.3	-0.9
	Product markets	0.2	0.2	0.6	0.8	0.8
	Labour markets	0.0	0.0	0.1	0.2	0.2
	<b>SUM</b>	<b>0.1</b>	<b>0.0</b>	<b>0.3</b>	<b>0.7</b>	<b>0.1</b>
R&D intensity (% of GDP)	Knowledge and innovation	0.1	0.3	0.5	0.4	1.2
	Product markets	0.0	0.0	0.1	0.1	0.1
	Labour markets	0.0	0.0	0.0	0.0	0.0
	<b>SUM</b>	<b>0.1</b>	<b>0.3</b>	<b>0.6</b>	<b>0.5</b>	<b>1.3</b>
Gov. balance (% of GDP)	Knowledge and innovation	0.0	-0.5	-1.2	-0.1	-2.2
	Product markets	0.5	0.5	1.8	2.5	2.5
	Labour markets	0.4	0.5	1.3	2.8	2.8
	<b>SUM</b>	<b>0.9</b>	<b>0.6</b>	<b>1.9</b>	<b>5.3</b>	<b>3.2</b>
Gov. debt (% of GDP)	Knowledge and innovation	0.0	2.5	6.3	0.0	11.2
	Product markets	-3.2	-3.2	-10.1	-15.6	-15.6
	Labour markets	-1.2	-1.4	-4.6	-10.1	-10.1
	<b>SUM</b>	<b>-4.4</b>	<b>-2.1</b>	<b>-8.5</b>	<b>-25.7</b>	<b>-14.5</b>

The extent of the economic gains and their time profile is also very much dependent on the timing of different reforms. If reforms are implemented at a slower speed, they will deliver a lower share of their benefits by 2020 (see Graph 13).<sup>(20)</sup> Conversely, an accelerated implementation of reforms will likely generate earlier benefits. Although a "big bang" reform scenario is very unlikely, at the very least because of the implementation lags, it could be possible to frontload some reform measures which have a relatively limited budgetary implications but deliver growth dividends relatively rapidly. Therefore, Graph 13 also shows the time profile of a hypothetical scenario which combines a speedy implementation of regulatory reforms (e.g. reductions in entry barriers and in administrative burden are implemented in 2011) and tax and labour market reforms (e.g. reforms of tax-benefit systems, tax systems or reforms in wage formation occur in 2011 and 2020) while it assumes that

costly reforms will only materialise over the whole lifespan of the Europe 2020 strategy. As mentioned above, these results should be viewed with a great deal of caution as the model simulations do not take into account possible costs of some of the reform measures which might change the time profile of the effects considerably.

Graph 13: Time profile of GDP effects under different phasing in assumptions (Scenario 3)



<sup>(20)</sup> It should be noted that the long-run benefits of reforms will not change.

**There is additional uncertainty concerning the aggregated effects of Europe 2020 linked to the fact that the presented scenarios do not cover all the policies foreseen under the strategy.** In particular, while the central objective of Europe 2020 is growth, ensuring that it is also "green" and "fair", in line with the Europe 2020 ambition, could potentially lead to some trade-offs. The link between growth and equity has been intensively debated in economic literature (see for example Benabou (1997) for a survey of the main theoretical explanations) and seems to involve multiple and complex channels. Over the past decade, economic growth and increases in employment have in general improved overall living standards and many governments have been able to devote more resources to social policy intervention. However, despite the clear redistributive effect of social protection, inequalities have often increased and poverty and social exclusion remain an issue in most EU countries, although with substantial differences across Europe.<sup>(21)</sup> The efforts to meet the climate change targets, which are also embedded in the Europe 2020 strategy, could also generate costs and reduce, at least temporarily, growth. A recent paper by Conte et al. (2010) using a "green" multi-sector version of the QUEST III model, however, demonstrates that a "green" growth agenda integrated within the EU2020 framework might alleviate the costs associated with reducing the carbon emissions. The paper simulates effects of several policy mixes which assume that the carbon emission targets will be met through adequate carbon pricing, e.g. imposition of carbon taxes or emission trading schemes. It shows that the negative long-run impact on output can be eliminated if the raised resources are effectively recycled into reductions in the tax burden on labour and increasing "green" R&D, which stimulates production of clean technologies.

#### 4. CONCLUSIONS

An essential part of Europe 2020 consists of reforms with a medium- to long-term horizon that focus on promoting the sustainability of public finances, enhancing potential growth and realising the 2020 objectives, i.e. ensuring that the EU becomes prosperous, green and fair. As shown in this paper, Europe 2020-like reforms have a potential to deliver significant gains in terms of additional output and new jobs. However, the extent of these benefits will naturally depend on the depth as well as breadth of undertaken reforms: if the EU succeeds in generating the reform momentum necessary to materialise the Europe 2020 vision, the gains could be considerably higher than in the case of piecemeal and shallow reform. The presented model simulations also document that fiscal consolidation efforts are crucial to rein in public debt increases. An ambitious fiscal consolidation will not affect negatively GDP growth: it will even bring about a slight increase in GDP by 2020. Progress with structural reforms, increasing potential growth and expanding tax bases, can help significantly these efforts. There is clearly significant uncertainty surrounding the effects of the presented stylised scenarios, linked to technical limitations of this exercise as well as the lack of knowledge on the specific policies to be followed under Europe 2020. Therefore, there is clearly scope for a more detailed (microeconomic) analysis once the individual flagship initiative will have been designed and agreed.

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<sup>(21)</sup> The Social Protection Committee (2009) "Growth, jobs and social progress in the EU". A contribution to the evaluation of the social dimension of the Lisbon Strategy, European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities. <http://ec.europa.eu/social/BlobServlet?docId=3898&langId=en>



# ANNEX

## Detailed results of macroeconomic effects of structural reform scenarios

Table 1:

Macroeconomic effects of structural reform scenarios

		Phasing in over 5 years					Accelerated phasing in				
		S1	S2	S3	S4	S5	S1	S2	S3	S4	S5
GDP	Knowledge and innovation	0,0	0,1	0,4	-0,1	0,6	0,0	0,1	0,4	-0,1	0,6
	Product markets	0,9	0,9	1,7	3,3	3,3	0,9	0,9	1,8	3,4	3,4
	Labour markets	0,4	0,5	1,3	2,9	2,9	0,4	0,6	1,4	3,0	3,0
	<b>SUM</b>	<b>1,3</b>	<b>1,6</b>	<b>3,5</b>	<b>6,2</b>	<b>6,8</b>	<b>1,3</b>	<b>1,6</b>	<b>3,6</b>	<b>6,3</b>	<b>7,0</b>
Employment	Knowledge and innovation	0,0	0,0	0,1	0,1	0,1	0,0	0,0	0,1	0,0	0,1
	Product markets	-0,1	-0,1	0,1	0,1	0,1	-0,1	-0,1	0,1	0,1	0,1
	Labour markets	0,6	0,9	2,1	4,3	4,3	0,6	1,0	2,2	4,4	4,4
	<b>SUM</b>	<b>0,6</b>	<b>0,9</b>	<b>2,3</b>	<b>4,5</b>	<b>4,6</b>	<b>0,6</b>	<b>0,9</b>	<b>2,3</b>	<b>4,6</b>	<b>4,7</b>
Unemployment rate	Knowledge and innovation	0,0	0,0	-0,1	-0,1	-0,1	0,0	0,0	0,0	0,0	-0,1
	Product markets	0,0	0,0	-0,1	-0,1	-0,1	0,0	0,0	-0,1	-0,1	-0,1
	Labour markets	-0,7	-1,1	-2,3	-4,6	-4,6	-0,7	-1,1	-2,3	-4,6	-4,6
	<b>SUM</b>	<b>-0,6</b>	<b>-1,0</b>	<b>-2,4</b>	<b>-4,7</b>	<b>-4,8</b>	<b>-0,7</b>	<b>-1,1</b>	<b>-2,4</b>	<b>-4,8</b>	<b>-4,9</b>
Current account (% of GDP)	Knowledge and innovation	-0,1	-0,2	-0,4	-0,3	-0,9	-0,1	-0,2	-0,3	-0,3	-0,7
	Product markets	0,2	0,2	0,6	0,8	0,8	0,2	0,2	0,6	0,8	0,8
	Labour markets	0,0	0,0	0,1	0,2	0,2	0,0	0,0	0,2	0,4	0,4
	<b>SUM</b>	<b>0,1</b>	<b>0,0</b>	<b>0,3</b>	<b>0,7</b>	<b>0,1</b>	<b>0,1</b>	<b>0,0</b>	<b>0,5</b>	<b>0,9</b>	<b>0,5</b>
R&D intensity (% of GDP)	Knowledge and innovation	0,1	0,3	0,5	0,4	1,2	0,1	0,3	0,5	0,4	1,1
	Product markets	0,0	0,0	0,1	0,1	0,1	0,0	0,0	0,1	0,1	0,1
	Labour markets	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	<b>SUM</b>	<b>0,1</b>	<b>0,3</b>	<b>0,6</b>	<b>0,5</b>	<b>1,3</b>	<b>0,1</b>	<b>0,3</b>	<b>0,5</b>	<b>0,5</b>	<b>1,2</b>
Gov. balance (% of GDP)	Knowledge and innovation	0,0	-0,5	-1,2	-0,1	-2,2	0,0	-0,5	-1,2	-0,1	-2,2
	Product markets	0,5	0,5	1,8	2,5	2,5	0,5	0,5	1,8	2,5	2,5
	Labour markets	0,4	0,5	1,3	2,8	2,8	0,4	0,5	1,3	2,8	2,8
	<b>SUM</b>	<b>0,9</b>	<b>0,6</b>	<b>1,9</b>	<b>5,3</b>	<b>3,2</b>	<b>0,9</b>	<b>0,6</b>	<b>1,8</b>	<b>5,3</b>	<b>3,2</b>
Gov. debt (% of GDP)	Knowledge and innovation	0,0	2,5	6,3	0,0	11,2	0,0	2,2	5,9	-0,1	10,0
	Product markets	-3,2	-3,2	-10,1	-15,6	-15,6	-3,2	-3,2	-10,1	-15,6	-15,6
	Labour markets	-1,2	-1,4	-4,6	-10,1	-10,1	-1,5	-1,9	-6,0	-13,1	-13,1
	<b>SUM</b>	<b>-4,4</b>	<b>-2,1</b>	<b>-8,5</b>	<b>-25,7</b>	<b>-14,5</b>	<b>-4,8</b>	<b>-2,9</b>	<b>-10,2</b>	<b>-28,8</b>	<b>-18,7</b>
		Immediate phasing in					Phasing in over 10 years				
		S1	S2	S3	S4	S5	S1	S2	S3	S4	S5
GDP	Knowledge and innovation	0,0	0,2	0,6	0,0	0,9	0,0	0,1	0,3	-0,1	0,4
	Product markets	1,0	1,0	1,9	3,7	3,7	0,8	0,8	1,5	2,9	2,9
	Labour markets	0,4	0,6	1,4	3,0	3,0	0,3	0,4	1,1	2,4	2,4
	<b>SUM</b>	<b>1,4</b>	<b>1,7</b>	<b>3,9</b>	<b>6,7</b>	<b>7,7</b>	<b>1,2</b>	<b>1,3</b>	<b>2,9</b>	<b>5,2</b>	<b>5,7</b>
Employment	Knowledge and innovation	0,0	0,0	0,0	0,0	0,1	0,0	0,1	0,1	0,1	0,3
	Product markets	-0,1	-0,1	0,1	0,1	0,1	0,0	0,0	0,2	0,2	0,2
	Labour markets	0,6	1,0	2,2	4,4	4,4	0,5	0,8	1,8	3,7	3,7
	<b>SUM</b>	<b>0,6</b>	<b>0,9</b>	<b>2,3</b>	<b>4,6</b>	<b>4,6</b>	<b>0,5</b>	<b>0,8</b>	<b>2,1</b>	<b>4,0</b>	<b>4,1</b>
Unemployment rate	Knowledge and innovation	0,0	0,0	0,0	0,0	-0,1	0,0	0,0	-0,1	-0,1	-0,2
	Product markets	0,0	0,0	-0,1	-0,1	-0,1	0,0	0,0	-0,1	-0,2	-0,2
	Labour markets	-0,7	-1,1	-2,3	-4,7	-4,7	-0,6	-0,9	-1,9	-3,9	-3,9
	<b>SUM</b>	<b>-0,7</b>	<b>-1,0</b>	<b>-2,4</b>	<b>-4,8</b>	<b>-4,8</b>	<b>-0,6</b>	<b>-0,9</b>	<b>-2,1</b>	<b>-4,1</b>	<b>-4,2</b>
Current account (% of GDP)	Knowledge and innovation	-0,1	-0,3	-0,4	-0,3	-1,0	0,0	-0,1	-0,2	-0,2	-0,6
	Product markets	0,2	0,2	0,7	1,0	1,0	0,2	0,2	0,5	0,6	0,6
	Labour markets	0,0	0,1	0,2	0,5	0,5	0,0	-0,1	-0,1	-0,2	-0,2
	<b>SUM</b>	<b>0,2</b>	<b>0,0</b>	<b>0,5</b>	<b>1,1</b>	<b>0,4</b>	<b>0,1</b>	<b>-0,1</b>	<b>0,1</b>	<b>0,3</b>	<b>-0,1</b>
R&D intensity (% of GDP)	Knowledge and innovation	0,1	0,3	0,5	0,4	1,1	0,1	0,3	0,5	0,4	1,1
	Product markets	0,0	0,0	0,1	0,1	0,1	0,0	0,0	0,1	0,2	0,2
	Labour markets	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
	<b>SUM</b>	<b>0,1</b>	<b>0,3</b>	<b>0,5</b>	<b>0,5</b>	<b>1,2</b>	<b>0,1</b>	<b>0,3</b>	<b>0,6</b>	<b>0,5</b>	<b>1,3</b>
Gov. balance (% of GDP)	Knowledge and innovation	0,0	-0,5	-1,4	0,0	-2,3	0,0	-0,4	-1,1	-0,1	-1,9
	Product markets	0,6	0,6	1,9	2,7	2,7	0,5	0,5	1,7	2,4	2,4
	Labour markets	0,4	0,5	1,3	2,8	2,8	0,3	0,5	1,2	2,6	2,6
	<b>SUM</b>	<b>0,9</b>	<b>0,5</b>	<b>1,8</b>	<b>5,5</b>	<b>3,1</b>	<b>0,8</b>	<b>0,5</b>	<b>1,8</b>	<b>4,9</b>	<b>3,1</b>
Gov. debt (% of GDP)	Knowledge and innovation	0,0	3,3	8,2	0,0	14,8	0,0	1,6	4,0	0,0	7,2
	Product markets	-4,2	-4,2	-13,3	-20,5	-20,5	-2,1	-2,1	-6,5	-10,1	-10,1
	Labour markets	-1,7	-2,1	-6,5	-14,2	-14,2	-0,7	-0,8	-2,8	-6,0	-6,0
	<b>SUM</b>	<b>-5,8</b>	<b>-2,9</b>	<b>-11,5</b>	<b>-34,7</b>	<b>-19,9</b>	<b>-2,8</b>	<b>-1,3</b>	<b>-5,3</b>	<b>-16,1</b>	<b>-8,9</b>

Note: "Accelerated phasing in" assumes that regulatory reforms (e.g. reductions in entry barriers and in administrative burden) are implemented in 2011; and tax and labour market reforms (e.g. reforms of tax-benefit systems, tax systems or reforms in wage formation) occur in 2011 and 2012.

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