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In Search of Growth in a Future with Diminished Expectations

The Case of Austria

Fritz Breuss

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In search of growth in a future with diminished expectations: The Case of Austria

Fritz Breuss

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Abstract

The euro area has – in contrast to the US economy - still not recovered from the "Great recession" 2009 and the following euro crisis. Some fear that Europe could embark into a decade of "secular stagnation" like Japan in the recent past. The US success can be attributed to the application of the strategy of the "three arrows": a co-ordinated expansionary fiscal and monetary policy cum permanent structural reforms. In contrast, the euro area has its hands tied by a self-imposed restriction in fiscal policy (new fiscal rules). Thus, the euro area remains as a growth-stimulating strategy only an expansionary monetary policy by the ECB plus "structural reforms" at the member state level.
Austria – after the expiring of the hitherto "EU growth bonus" – has also to look for new strategies to stimulate growth by its own. In simulations with a macro-growth model for Austria alternative growth scenarios are analysed: structural reforms to improve efficiency in product und labour markets; investment in knowledge and innovation (R&D); more globalisation; traditional demand policies (monetary and fiscal). The most promising strategies are more globalisation and structural reforms plus R&D investments. Most of these strategies would stimulate growth without impairing fiscal sustainability.

Keywords: European Integration; Model simulations; country studies.
JEL Classification: F15; C51; O52.

Contents

1. Introduction*)

In the aftermath of the Great Recession 2009, caused by the global financial and economic crisis (GFC) Europe and in particular the EU and the euro are is still struggling for a proper recovery from the crisis. Whereas the US economy in 2015 will already have surpassed the level of pre-crisis (2007) real GDP by around 12 percentage points, real GDP in EU-28 (+2%) and the euro area (+0%) will hardly have reached pre-crisis levels. This is all the more surprising, as the crisis originated in the United States. However, the drop in real GDP in 2009 was milder in the USA (-2.8%) than in the EU/euro area (-4.5%) and the GFC was followed by a self-generated Euro crisis. As a consequence unemployment is declining in the United States whereas it surges in Europe to unprecedented levels and hence creating a huge "social problem" undermining the idea of an ever closer Union.

The most recent economic forecasts (e.g. OECD, 2014A; European Commission, 2014A) see a continuation of the divergent development in the United States and in Europe in the near future. Whereas the United States and also Japan, in the latter case particular under the not so successful political experiment of "Abenomics" try to combine the three pillars (or arrows) of economic policy – an expansionary monetary policy in combination with a supportive fiscal policy and permanent structural reforms – Europe since the euro crisis has restricted its policy options. From aggregate demand policy in the euro area only the monetary side remains actively expansionary by the ECB. The fiscal side is restraint by the self-imposed new fiscal rules under the New Economic Governance of EMU. For EU/euro area member states, hence, only the third pillar – structural reforms – remain as a viable strategy to foster growth in Europe.

Austria as member of the EU and euro area fits into the picture of the gloomy medium-term outlook for growth. Nevertheless, it is a special case. Until recently Austria has profited heavily from an "EU growth bonus" due to taking part in all steps of European integration. However, as the speed of further EU integration internally (consolidation of the projects of the Single Market and EMU) is fading and externally (no further enlargement) will came to a standstill in the years to come, the former growth bonus of Austria's EU membership runs out. In the medium to long run, Austria is confronted with diminishing growth prospects and hence, will also be forced to stimulate growth with non-Keynesian supply-side or structural reform steps.

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*) I want to thank Werner Roeger for helpful comments on an earlier version of this paper.

In this paper – after a survey of studies on the possible impact of structural reforms in Europe – we develop a New-Keynesian type macro-growth model to analyse alternative growth strategies for Austria.

2. Structural reforms to avoid secular stagnation in Europe

It is too early to state that Europe or the euro area already has embarked into a decade of "secular stagnation" like Japan in the recent past as some doomsday experts (e.g. Summers, 2013, 2014) are painting on the wall. It is true that Europe has more troubles to get rid of the crisis than the United States. The signs of the crisis in the euro area are obvious: low growth and a dramatic increase in unemployment.

We still do not have a final explanation of the recent crises. Currently, there are only some contradicting narratives available (see Breuss, 2015B)[1]. On the one hand there is the story told by Reinhart and Rogoff (2009, 2010, 2011) that historic experience shows that high and increasing public debt hampers future economic growth. And the process of deleveraging often happens – as currently in the euro area with near-zero interest rates – by "financial repression" (Reinhart et al., 2011). Others call the present situation a "balance sheet recession". Whereas the inventor of the term "secular stagnation"[2], Hansen (1938) saw the main reason for stagnation in declining population growth, Koo (2008, 2014) sees secular stagnation caused primarily by a "balance sheet recession". The Great Recession is often compared to Japan's stagnation since 1990 and the Great Depression of the 1930s and the danger of "Japanisation" is present. Koos (2014) argues that the key feature of these episodes is the bursting of a debt-financed asset bubble, and that such 'balance sheet recessions' take a long time to recover from. There is no need to suffer secular stagnation if the government offsets private sector deleveraging with fiscal stimulus[3]. However, until the general public understands the fallacy of composition, democracies will struggle to implement such policies

[1] Martin and Phillippon (2014) construct a DSGE model with which they study by counterfactual experiments the often cited four major causes which led to the euro crisis. They ask the question (in particular concerning the periphery countries of the euro area) how would they have fared with: (i) more conservative fiscal policies to prevent over-indebtedness of the public sector; (ii) macro-prudential tools to control private leverage; (iii) a central bank (the ECB) acting earlier (already in 2008 and not in July 2012) to limit sovereign spreads (Draghi's declaration "Whatever it takes"); and (iv) the possibility to recoup the competitiveness they lost in the boom.

[2] In an anthology on "secular stagnation" Teulings and Baldwin (2014) try to get clarity on this notion by reporting on facts, causes and cures. See also Eichengreen (2014).

[3] Several theorists already try to understand the causes of the Great Recession in the euro area via processes of deleveraging (deleveraging shocks) by using DSGE model techniques. Eggertsson and Mehrotra (2014) explicitly construct a model of secular stagnation to understand the Japanese stagnation. Eggertsson and Krugman (2012) analyse many aspects of deleveraging in general.

during balance sheet recessions. And in the euro area particularly, the New Economic Governance (see Breuss, 2013A)[4] has put breaks to stimulate further the economy fiscally. Which policy options are then available for European politicians? It seems that EU member states outside the euro area (like Poland and the United Kingdom) can more flexibly act because they still have the option of depreciating their currency. Euro are countries have no longer this option.

If "Abenomics" for several reasons (the public debt level would be unsustainable for Europe; see Fuster, 2014) cannot be a model for the euro area what are then the remaining options for the euro area. ECB President Mario Draghi in his speech (primarily on *"unemployment in the euro area"*) at the Annual central bank symposium in Jackson Hole in August 2014 (see Draghi, 2014) stressed the importance of fiscal policy to simulated growth in Europe besides the necessary structural reforms and the supportive role of *monetary policy* by the ECB. Although Draghi later made clear that his thoughts are not an invitation to soften the Stability and Growth Pact, the spirit of a "grand bargain" between ECB and European politicians (fiscal policy)[5] escaped the bottle and haunts around the EU political circles (see Fuster, 2014). Since then, France and Italy talk about more flexibility in the new fiscal rules meaning giving up the rules altogether. Nevertheless, even Draghi (2014) pointed out, that fiscal policy had contributed positively to employment in virtually all countries during the first phase of the crisis, thus somewhat cushioning the shock of the Great Recession in 2009. In the second phase, however, fiscal policy was constrained by concerns over debt sustainability and the lack of a common backstop, especially as discussions related to sovereign debt restructuring began. The necessary fiscal consolidation had to be frontloaded to restore investor confidence, creating a fiscal drag and a downturn in public sector employment which added to the ongoing contraction in employment in other sectors.

The main guidelines for EU's economic policy are defined in the *2015 Annual Growth Survey (AGS)* published by the European Commission in the context of the annual cycle of the "European Semester" (New Economic Governance of the EMU) on 28 November 2014 (see: European Commission, 2014B). The AGS 2015 focuses on putting Europe firmly back on a path of sustainable job creation and economic growth. The arrival of the new Commission, with an ambitious agenda for Jobs, Growth, Fairness and Democratic Change (see Juncker, 2014), will target the urgent problems of the EU (unemployment and slow growth). However,

[4] A new feature of the new economic governance in the case of stabilizing the financial markets is the creation of the European Banking Union (see Breuss, 2012, 2013B, 2015A; Breuss et al., 2015).

[5] Theoretically it has been demonstrated time and again that ex ante coordination of monetary and fiscal policy in the euro area would lead to optimal results. The EU Treaty, however, explicitly excludes such a meaningful strategy (see Breuss, 2006, chapter 13).

in principle it reiterates its well-known primary policy targets by pursuing an economic and social policy based on *three main pillars*: (1) a boost to investment (the new *"€300bn Juncker Investment Plan"* [6]), (2) a renewed commitment to *structural reforms* (priorities include removing remaining regulatory and non-regulatory barriers across sectors such as energy, telecoms, transport and the Single Market for goods and services) and (3) the pursuit of fiscal responsibility (*responsible and growth-friendly fiscal policies*, in line with the Stability and Growth Pact (SGP)), taking into account the particular national situation; countries with more fiscal space have more scope to encourage domestic demand and investment). The European Council (2014) on 18 December 2014 repeated the three pillar strategy by stressing the new focus on investment (confirming the Juncker's "Investment Plan"), coupled with Member States' commitment to intensifying *structural reforms* and to pursuing growth-friendly fiscal consolidation. Accordingly, only this triple strategy will provide the foundation for growth and jobs in Europe. However, besides the new but yet uncertain initiative by Juncker's "Investment Plan" to stimulate growth at EU level the new European Commission as well as the Heads of State or Government (European Council) stick to the fiscal restraint by the SGP and the Fiscal Compact with its "debt breaks". Hence, the only – budget-neutral - policy option which EU Member States can follow to stimulate growth in the medium to long run is to embark on a strategy of *structural reforms*.

Taking all together, traditional (demand-side) fiscal or monetary policy will be unable for a longer period of time to stimulate growth and create new jobs in Europe. This calls for alternative (supply-side) policy approaches based on endogenous growth theory. One can subsume these insights under the title "structural reforms". Anticipating the restrictions in policy options in Europe, several international organizations (EU, IMF and OECD) have developed scenarios on the potential growth impact of structural reforms of the labour and product markets already around the Great Recession 2009 and afterwards.

[6] The newly elected President of the European Commission, Jean-Claude Juncker announced its "€300vn Investment Plan" on 15 July 2014 (Juncker, 2014) and presented details of his "Investment Plan" at the European Parliament on 26 November 2014 (see: http://europa.eu/rapid/press-release_IP-14-2128_en.htm). A new **"**European Fund for Strategic Investments" (EFSI), set up in partnership with the European Investment Bank (EIB), guaranteed with public money should mobilise at least € 315 billion of additional (private) investment over the next three years (2015 - 2017). The expected multiplier effect of the Fund will be 1:15**.** The Juncker Plan has been confirmed by the European Council (2014) on 18 December 2014. Whether Juncker's kick-start for the European economy will work or only "rests on some magical thinking" (see The Economist, 2014) is an open question. Due to a delayed time plan – only by mid-2015 the EFSI will be operational – it will hardly be a quick remedy to cure the present crisis. Griffith-Jones and Cozzi (2014) simulated the potential macroeconomic impact of the "Juncker Plan" with the CAM (Cambridge-Alphametrics model). Accordingly, it would result in more growth and 5 million additional jobs.

2.1 European Commission

Experts of the European Commission have produced already several studies on the growth impact of structural reforms. Early studies, analysing the growth effects for all EU member states with the QUEST model were done by Roeger et al. (2008) and D'Auria et al (2009). Recently, the Commission summarized the model results for the four largest Euro area countries (Germany, France, Italy and Spain; see Euro Area, 2013). Varga et al. (2014) have done the same exercise for the four Southern European countries of the Euro zone (Greece, Italy, Spain and Portugal). Varga and in 't Veld (2014A, 2014B) have made an update of the quantitative model-based assessment of the potential impact of structural reforms in all EU Member States.

The Commission studies are pursuing the following goals. The first objective is to set up a framework which captures many of the dimensions in current reform discussions, i.e. the model should allow to make predictions about the impact of labour and goods market reforms. Second, it should be sufficiently detailed to capture market imperfections, regulatory constraints, fiscal burdens (tax wedges and administrative costs) but also allows analysing constraints imposed by endowments, which for a modern economy are usually skill shortages. Third, given the importance of total factor productivity (TFP) for long term growth it is useful to have a framework where TFP is endogenous and is generated by knowledge investment decisions of firms and households. For this purpose, they had to choose a specific type of theoretical growth model. Former R&D based models (see Romer, 1990) predicted unjustified scale-effects (if the level of resources devoted to R&D is doubled, then the per capita growth rate of output should also double in the steady state). Jones (1995, 2005) offered an alternative setting for the product-variety paradigm, a semi-endogenous growth model which avoids the inconsistent scale-effects.

For the assessment of the growth impact of structural reforms the Commission studies developed an extension of the Jones model to capture the endogenous development of R&D within the framework of a standard Dynamic Stochastic General Equilibrium (DSGE) model of QUEST. The model follows the QUEST3 (RD) model structure of Roeger et al. (2008) in a multi-country setting of D'Auria et al. (2009) and includes all EU Member States individually and the rest of the world as a single separate region, thus allowing an analysis of several spillover effects (demand, competitiveness, international financial flows and knowledge spillovers) in a context of simultaneous reforms. Overall net macroeconomic spillovers are typically found to be relatively small, though not negligible, due to counterbalancing demand and competitiveness effects. In addition to the R&D framework this model also includes the

disaggregation of labour into three skill groups (low-, medium-, and high-skilled) in order to capture differences in human capital endowments. The Jones model is further extended by introducing mark-ups for the final goods sector and entry costs for the intermediate sector. Two types of households (liquidity and non-liquidity constrained) are standard in DSGE models.

Reform shocks are based on a set of structural reform indicators covering a wide range of areas, including market competition and regulation, R&D expenditure, skill structure, tax structure, labour market participation, unemployment benefit 'generosity' and active labour market policies. The potential for reform are defined as a closing by one-half of the gap in these indicators vis-à-vis the three best-performing countries in the EU.

The major results of Euro Area (2013, p. 25) can be summarized as follows:

1) The model simulations indicated large potential gains which could be reaped from structural reforms. Euro-area GDP could be up to 6 % higher after ten years if Member States adopt measures to halve the gap vis-à-vis the average of the three best-performing Member States in each of the reform areas considered.
2) The largest contribution comes from labour market reforms to raise the participation rate of the inactive population (women and low-skilled and older workers). The shift from taxes on labour towards consumption taxes and active labour market policies also have considerable effects on GDP. Skill-enhancing measures and entry cost reductions have a major impact on GDP in the long term, accounting for almost half of the long-term total GDP effects for Italy (+4.6% after 10 years). Further contribution stem from product market reforms (mark-up reduction), while R&D-promoting policies have small negative effects in the short term but more significant positive effects in the long term, especially for Germany (total growth level effect after 10 years +2.4%).
3) In all "programme countries" of the euro area the growth potential of structural reforms are largest because they have the most to catch-up with the best performers in the North. After a period of ten years of structural reforms the level of real GDP could increase by 10% in Greece, by 5% in Portugal, by 6.8% in Ireland, by 6.7% in Spain and by 6% even in France. Varga et al. (2014) find similar – but more pronounced - results for Greece (GDP-effect after 10 years 13.8%; employment effect +7.8%); Italy (+3.3% and +2.8%); Portugal (+7.9% and +4.8%) and Spain (+8.7% and +6.3%).
4) Also the employment effects are significantly positive in case of structural reforms.

In the update of the quantification of the potential impact of structural reforms in all EU Member States, Varga and in 't Veld (2014A, 2014B) compare structural indicators of labour

and product markets. A gap is defined for each indicator relative to the 3 best performers. Scenarios are then simulated with the semi-endogenous growth version of the QUEST model (QUEST3(RD)) in which half the gap vis-à-vis best performance is closed, to avoid setting unrealistic and/or unattainable targets. The simulations show large potential gains in output and employment, raising EU GDP in the case of stand-alone implementation by the EU Member States by 3 % after five years and 6% after ten years (similar results are found for Austria). The long run gains are largest for Greece, due to the considerable scope for reforms identified in all areas by the distance-to-frontier approach (see also Figure 6). GDP is 17.5% higher after 20 years (9.2% after 10 years), even when only half the gap is closed. Italy, Malta and Romania show similar large gains of between 15 and 17% after twenty years. Countries closest to the best performance frontier have the smallest output gains, although even their benefits from further reforms can be significant. For Sweden, GDP is 2.6% higher after twenty years, for Denmark, Estonia, and the UK between 5% to 7%. Other countries lie between these two extremes, with their output gains roughly proportional to the identified structural gaps.

The growth enhancing effect can – due to spillover effects - be increase when the structural reforms are implemented jointly in all EU Member States. In the long-run the cumulative GDP effect in the EU is one percentage point higher than in the stand-alone scenario (see Varga and in 't Veld, 2014B, p. 15; and D'Auria et al., 2014, p. 13-15).

In all studies by the European Commission the growth impact of structural reforms are increasing over time. According to the latest study (Varga and in 't Veld, 2014B), the GDP level in EU-28 increases by 3% after five years, 6% after 10 years, 11% after 20 years and 16% after 50 years.

2.2 IMF

According to the IMF substantial empirical evidence shows that structural reforms can lift growth markedly in the medium to long term. After reviewing the literature of growth effects of structural reforms, staff simulations (see Barkbu et al., 2012) with IMS's calibrated Global Monetary and Fiscal (GIMF) model – a structural model that brings together both economic agents that optimize freely (firms maximize profits, and households maximize utility from consumption and leisure) and liquidity-constrained agents - show that large-scale labour, product market, and pension reforms could boost output considerably. GIMF results suggest that eliminating 50 percent of euro area countries' gap with OECD best practice in labour market and pension policies could boost their GDP on average by almost 1½ percent after 5 years, and by another 2¼ percent through product market reforms. The results show a

positive impact in the short run for all reforms. Combined reforms in the labour and product market could yield additional output of up to 0.6 percentage point in the euro area in the first year. Active labour market policies could have an immediate positive impact, larger than its long-term effect, mainly because they entail fiscal spending. The benefits from product market reforms are mostly achieved in the long run, and given the greater distance from "best practice," the gains appear considerably higher than the labour market reforms. Additionally, reforms can produce sizeable spillovers – in particular for the Southern euro area countries. Trade and technology spillovers imply that structural reforms in one country increase growth in other countries. The GIMF analysis shows that the Southern euro area countries would gain more from reforms than the Northern countries.

A "heatmap" for selected ero area countries (see Barkbu et al., 2012, p. 33) identifies the structural reform gaps according to several indicators (institutions; infrastructure; human capital; employment protection; business regulation; openness to trade and FDI; credit market rigidity; innovation). Whereas the Southern euro area countries (in particular Greece) are "red" in nearly all indicators, in the Northern euro area countries most indicators are "green" (leading position). Austria – belonging to the group of OECD best practice countries – is "red" in "doing business" and "yellow" in some indicators (extent of public ownership; employment protection; market size and barriers to FDI); all other indicators are in the "green" region of best practice.

2.3 OECD

The OECD studies uses two kinds of methodologies to assess the growth impact of structural reforms. Bouis and Duval (2011) use an econometric approach to estimate the effects on total (multi) factor productivity growth of product market reforms (PMR) and the effects on labour productivity growth of employment protection legislation (EPL). The growth impact of the structural reform steps are then simulated by assuming that the level of anti-competitive regulation in non-manufacturing upstream sectors converges to the average of the three lowest values observed in 2007 across countries. Results of simulations suggest that a gradual alignment of product market regulations to best practice in a broad range of non-manufacturing sectors could boost aggregate labour productivity levels by several per cent over the next decade in many OECD countries, and by over five per cent across most of continental Europe. Relaxation of job protection legislation could also raise productivity growth for a while in many OECD and non-OECD G20 countries, although the effects are estimated to be smaller than those from product market reforms. The overall potential GDP gain for the average OECD country from undertaking the full range of reforms might come

close to 10% at a 10-year horizon, indicating the presence of ample room for structural reforms to offset the permanent GDP losses from the recent crisis.

In another OECD study Cacciatore et al. (2012)[7] use a theoretical DSGE model to simulate the short-term gains from structural reforms in the labour and goods markets for OECD countries and trying to answer the question whether structural reforms will deliver more gains than cause pains. The analysis yields three main findings: First, it takes time for reforms to pay off, typically at least a couple of years. This is partly because their benefits materialise through firm entry and increased hiring, both of which are gradual processes, while any reform-driven layoffs are immediate. In the long-run structural reform steps can lead to an increase of the level of real GDP between 1% and 11%. Second, all reforms appear to stimulate GDP already in the short run, but some of them - such as job protection reforms - are found to increase unemployment temporarily. Implementing a broad package of labour and product market reforms enables governments to minimise or even alleviate such transitional costs. Third, reforms are not found to have noticeable deflationary effects, suggesting that the inability of monetary policy to deliver large interest rate cuts in their aftermath – either because of the zero bound on policy rates or because the country belongs to a large monetary union – may not be a relevant obstacle to reform implementation.

3. Austria's growth path back to normality

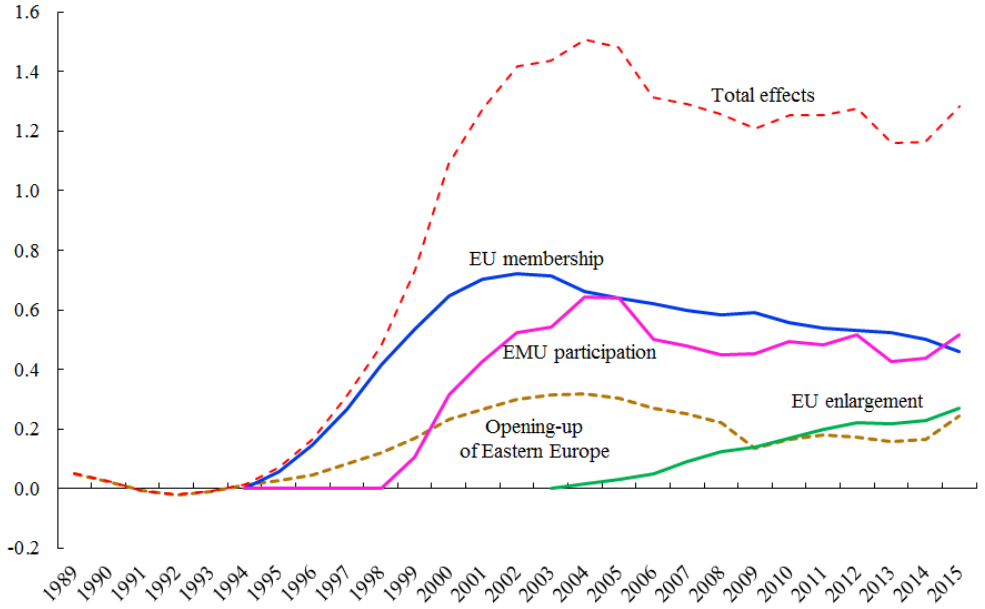
Austria is changing from a period of happiness into a phase of normality with diminishing expectations. Austria's economic luck in the past quarter of a century is strongly connected with geography and history. The world historical events in Eastern Europe in 1989 with the following opening-up of their economies towards the West and their ambitions to become members of the EU favoured first of all Austria. During the period of the Cold War and the separation of Europe into the West and the East, Austria was locked at the border of both Europes. After the opening-up Austria moved into the centre of Europe and exploited quickly and intensely its former historical ties. This competitive advantage of Austria was sometimes called the "Habsburg" effect. This external growth factors (new markets in Eastern Europe after the opening-up of the East in 1989 and the EU enlargements in 2004/07/13) were reinforced by Austria's participation in all internal EU integration steps (Single Market via EU accession in 1995 and participation in EMU in 1999 and takeover of the Euro in 2002). As these external growth factors are going to fade out in the near future, Austria's economy is embarking into a "normal" economic status deriving its impulses to growth no longer from externally generated luck, but must generate them by its own smart economic policy.

[7] For a new version of this study, see: Cacciatore and Fiori (2014).

3.1 EU „growth bonus" expires

In most phases since 1960 Austria's economy has grown faster than those of the USA as well as those of EU-15. Austria's advance in GDP growth was particularly pronounced since the opening up of Eastern Europe in 1989 (see Breuss, 2014A, p. 12). Only in the phase 1980-1990 and in the phase of the GFC 2008/09 Austria's growth of real GDP per capita was somewhat weaker than those in the USA but either similar to those of EU-15 (1980-1990) or Austria had better adjusted to the "Great Recession" of 2009 than the EU on average. In the period 1989-2015 Austria's real GDP grew by 2.1% (GDP per capita +1.6%) compared to 1.7% (1.1%) in EU-15 and 2.5% (1.5%) in the USA, 2.0% (0.8%) in Germany and 1.6% (0.8%) in Switzerland. The advance of Austria's GDP growth vis à vis EU-15 (0.5 percentage points), Germany (0.9 ppt.), Switzerland (0.8 ppt.) is hardly explicably without the "growth dividend" of EU membership.

Figure 1: Effects of Austria's participation in all steps of EU integration since 1989
GDP, volume, percentage changes from previous year (moving 6-year averages)



Source: Breuss (2014A).

Since 1995 Austria as an EU member takes part in the deepening of EU integration (Single Market, EMU and euro) and participates in the enlargement process of the EU. Around the years 2014/15 Austria celebrates several anniversaries: 25 years of the fall of the Iron Curtain and hence expansion of new market opportunities through the opening-up of Eastern Europe; 20 years of EU and 15 years of EMU (euro) membership; 10 years since the start of the big EU enlargement towards Eastern Europe. With the Croatian accession in 2013, the EU now counts 28 members.

As an exception of the otherwise existing "Integration Puzzle"[8] Austria gained in all phases of EU integration. According to a recent ex post evaluation (see Breuss, 2014A) real GDP grew by 0.2% per year due to the opening-up of Eastern Europe (over the period 1989 to 2015), by 0.6% due to EU membership (over the period 1995-2015), by 0.5% due to participation in EMU (Euro) (over the period 1999-2015) and finally by 0.2% due to EU enlargements over the past decade (2004-2015). Overall, the participating in all integration steps since 1989 has cumulatively added about 1% to Austria's real GDP per year (see Figure 1).

As no further impulses from EU integration – internally (EMU's economic governance has already been adjusted) and externally (there are no new accessions planned in the period of Juncker's Commission, 2015-2020) – are to be expected and Eastern Europe is falling into a phase of crisis (Ukraine Russia conflict; political instability in some new EU members states) the "growth bonus" Austria was happy to consume in the last decades is definitely fading.

3.2 Diminished growth expectations

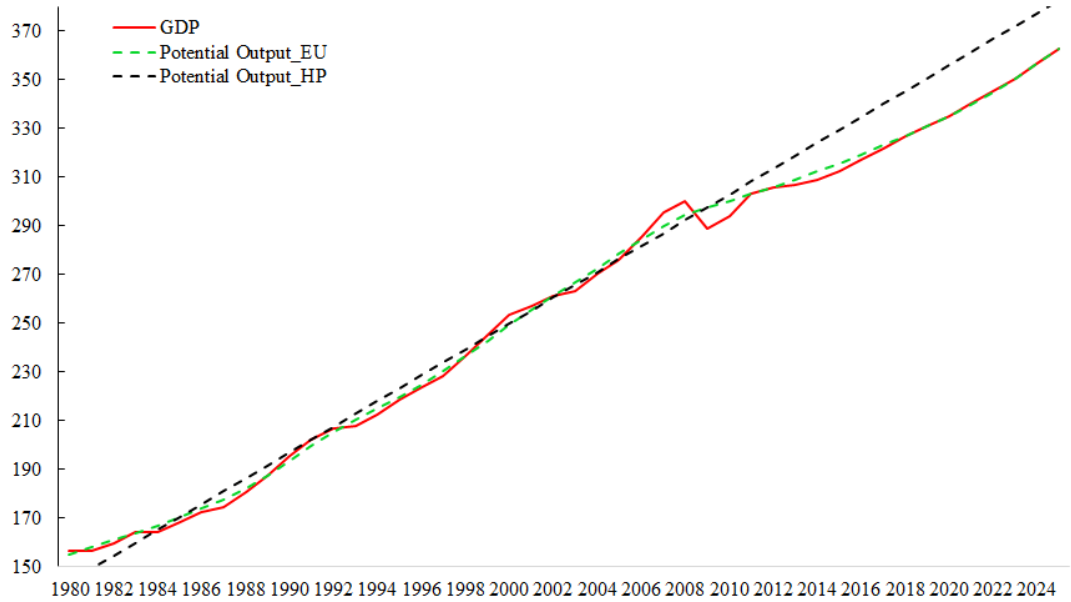
Most medium term forecasts of international organizations (IMF, 2014; European Commission, 2014A and OECD, 2014A) are rather gloomy for Europe, in particular for the Euro area and hence also for Austria. Roeger (2014) sees in the ECFIN's medium term growth projections even the risk of "secular stagnation". In order to evaluate the impact of structural changes to stimulate growth we constructed a baseline scenario of growth for the next ten years up to 2025, based on the most recent international forecasts (see Figure 2). Using a mechanical method to estimate potential output (Hodrick-Prescott filter) it seems that the growth of actual output up to 2025 is not able to close the output gap. Calculating potential output is, however, a difficult business. Therefore each institution makes own calculations based on different methods (production function or trend methods). The potential output calculated by the European Commission (2014A) is much more "flexible" and adjusts rather quickly to actual output after the Great Recession in 2009[9] (see Figure 2).

[8] The gap between theoretically expected and realized integration effects concerning GDP growth in the EU as a whole is called "EU Integration Puzzle" (see Breuss, 2014C).

[9] The estimation method (production function approach) of potential output by the European Commission (see D'Auria et al., 2010; for the new version, see Havik et al., 2014) which is also used to calculate structural deficits (Larch, 2014) is recently criticized of resulting in an underestimation of the cyclical component of general budget balances which as a consequence forces to stricter than necessary fiscal austerity by Fiscal Compact rules in times of crisis (see Schulmeister, 2014). However, compared with the previous 2010 paper on the same topic (D'Auria et al., 2010), the new version of the EU methodology to calculate potential output and output gaps, has made two significant changes to the production function methodology, namely an overhaul of the NAWRU methodology & the introduction of a new T+10 methodology. With the launch of the Europe 2020 Strategy, the implementation of the European Semester, as well as periodic exercises such as the Ageing Report, the EPC (EU's European Policy Committee) considered it necessary to have a set of integrated, no policy change, macroeconomic projections which covered the period up to T+10 (the description of the new T+10 methodology can be found in Havik et al, 2014, pp. 39-45).

Common to all potential output calculations is that with a few exceptions (USA, United Kingdom) potential output is far above actual output after the Great Recession 2009; i.e. most advanced economies did not yet reach its pre-crisis potential output level (for a comparison, see Ball, 2014).

Figure 2: The baseline scenario for Austria's medium term economic growth
(Real GDP and Potential Output in bn EUR at 2010 prices)



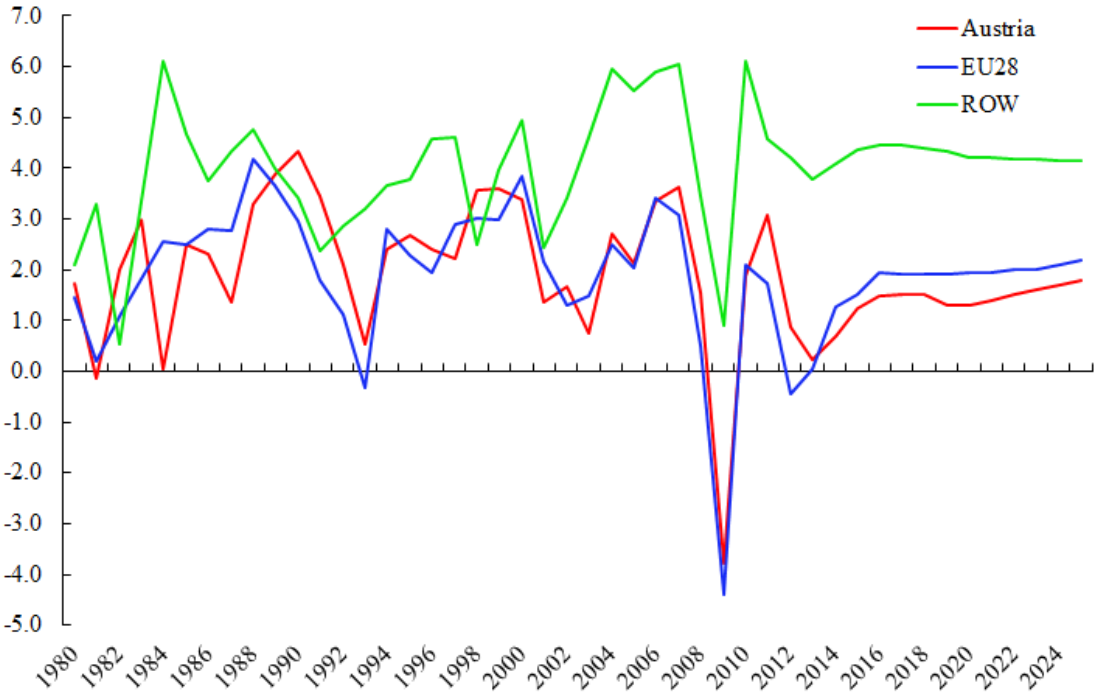
Source: AMECO database of the European Commission; own forecast 2016-2025; Potential output: Green broken line: European Commission, (2014A); black broken line: Hodrick-Prescott filter of GDP for the period 1980-2008 and trend extrapolated to 2025.

Translated into GDP growth rates this shows that Austria which - due to the EU growth bonus - in the pre-crisis period was always leading other European countries will fall behind the EU-28 GDP growth rates (see Figure 3). Many reasons might be responsible for the end of Austria's growth miracle: (1) the fading of the "EU growth bonus" as no further integration initiatives are to be launched by the European Commission in the medium-term; (2) the slowing down of the growth expectations in the neighbourhood of Austria, in the new EU member states in Eastern Europe which - due to the huge catching-up needs after the opening-up of Eastern Europe in 1989 - played the role of "new emerging" markets for Austria and promoted a "mini-globalisation". In recent forecasts, the growth expectations for the new EU member states are halved compared to the recent past; and (3) Austria's lead in economic growth is stopped by a process of "rebalancing" in the euro area[10] by which the hardest hit periphery countries are recovering faster than the old neighbouring countries. All three factors

[10] Hobza and Demertzis (2014) state that, Euro area countries with high current account deficits before the start of the crisis have now achieved balanced positions or even surpluses.

together seem to indicate that Austria is embarking from the old high growth economic equilibrium to a new economic equilibrium with slower growth in the future.

Figure 3: The baseline growth scenario for Austria, EU-28 and the rest of the world
(Real GDP at 2005 prices; % change over previous year)

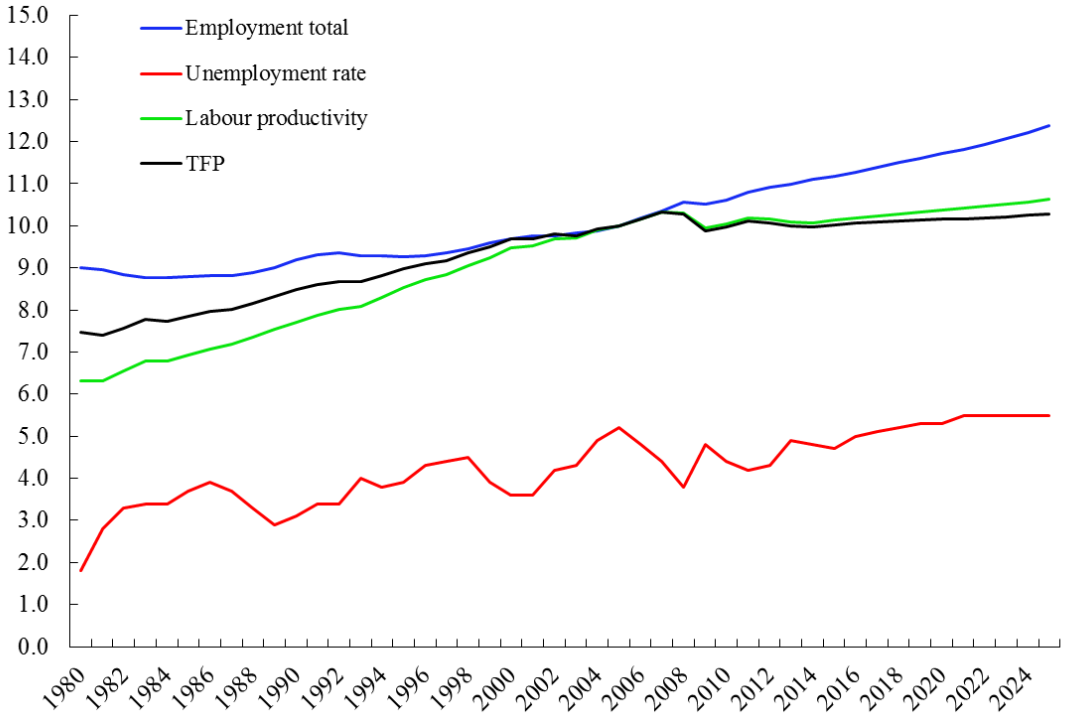


Source: AMECO database of the European Commission; own forecast 2016-2025
Average annual GDP growth rates: 1980-2008: Austria +2,3%, EU-28 +2,2%, ROW +3,9%; 2009-2025: Austria +1,1%, EU-28 +1,3%, ROW (Rest of the world) +4,2%.

The other macro variables – e.g. the labour market indicators – are extrapolated according to the recent forecasts (see Figure 4). Total employment will rise by around 1% per year in the next decade, somewhat more than before. The growth of labour productivity is expected to decline in the near future (1989-2015 +1.2%; 1995-2015 +1.0%; 2016-2025 +0.5%). Unemployment rate is expected to rise in the next decade on average to 5.3%, one percentage points higher than in the period 1995-2015.

The main driver of GDP growth is total factor productivity (TFP) calculated from a Cobb Douglas production function with a wage share of 0.70. TFP increased strongly in the period of Austria's engagement in European integration since the opening-up of Eastern Europe in 1989. After the great shock of the GFC 2008/09 and the "Great Recession" 2009 the TFP growth trend – in tandem with labour productivity - is declining. In terms of average growth rates this means that GDP growth (+1.5%) in the next decade (2016-2025) must be expected to be lower than in the periods before (1989-2015 +2.1%; 1995-2015 +1.7%). Potential output exhibited similar growth rates. TFP growth will also decline (1989-2015 +0.8%; 1995-2015 +0.6%; 2016-2025 +0.3%).

Figure 4: The baseline scenario for Austria's medium term labour market
(Total employment, labour productivity and TFP: 2005=10; unemployment rate in %)

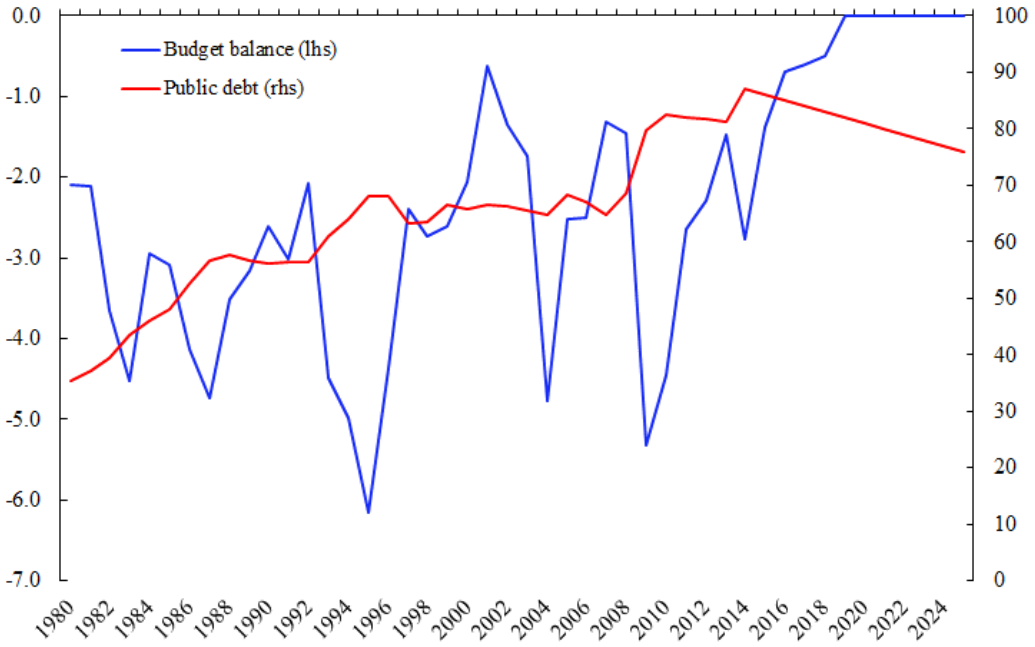


Source: AMECO database of the European Commission; own forecast 2016-2025

To forecast the relevant indicators for fiscal policy until 2025 we used the "Stability Programme" (see BMF, 2014A, 2014B) of the Austrian Government in combination with the latest autumn 2014 forecast by the European Commission (2014A)[11]. The respective indicators for the development of the budget balance (net-lending) and the public debt to GDP ratio might seem to be rather optimistic. Accordingly in 2018 the net-lending should be down to 0.5%. For the following years we estimate a balanced budget. The public debt to GDP ratio should have reached a peak already in 2014 with – after the revision of the European System of Accounts (ESA 2010) – a level of 87%. After that it should fall to 75% in 2025 (see Figure 5). If, however, new burden like those of the Hypo Group Alpe Adria bank (Hypo) or defaults of other Austrian banks due to the Russia-Ukraine crisis might arise this would add again to the public debt level.

[11] In the context of the reformed SGP, on 28 November 2014 the European Commission (2014C) published its Opinion on the Draft Budgetary Plans of Austria The Commission is of the opinion that risks of not fulfilling the requirements of the preventive arm of the Stability and Growth Pact remained in 2014 and therefore invited the authorities to take all necessary measures to ensure full compliance with the preventive arm of the Pact in 2014 and beyond. The debt-to-GDP level is too high and Austria has made limited progress with regard to the structural part of the fiscal recommendations issued by the Council in the context of the 2014 European Semester and thus invites the authorities to accelerate implementation (see: http://ec.europa.eu/economy_finance/economic_governance/sgp/pdf/dbp/2014/at_2014-11-28_co_en.pdf).

Figure 5: The baseline scenario for Austria's fiscal policy
(Budget balance – net-lending and public debt in % of GDP



Sources: AMECO database of the European Commission; own forecast 2016-2025 based on BMF (2014A, 2014B).

4. Austria's policy options to stimulate growth

In view of the gloomy growth perspectives in the EU, the euro area and hence also in Austria a discussion about alternative growth drivers is necessary. As already discussed the traditional Keynesian fiscal stimuli are no longer viable as the public debts are still too high for such policy manoeuvres. As the extreme moderate central monetary policy stance of the ECB has also come to an end alternative approaches are necessary in the near future. As described in chapter 2 most international institutions (European Commission, IMF and OECD) already made suggestion how to stimulate growth without violating the public debt targets. The key is structural reform. In order not to talk in this context only with a "buzzword", model simulations are a method to evaluate the growth impact of structural reforms. The reference for such models is the endogenous growth theory of Romer (1990), Jones (1995, 2005), Aghion and Howitt (1992, 1998, 2006, 2009), Acemoglu (1998, 2002, 2007) and Acemoglu and Autor (2011). These authors of the modern growth theory deal extensively with the question how to endogenize technical progress (total factor productivity, TFP).

The models used in the studies of the EU, the IMF and OECD primarily relied on a standard New-Keynesian type Dynamic Stochastic General Equilibrium (DSGE) models. The most recent exercise to evaluate the growth impact of structural reforms in Southern Europe (see Varga et al., 2014) can function as a prototype. Their DSGE model sets up a framework

which allows to make predictions about the growth impact of labour and goods market reforms. It captures market imperfections, regulatory constraints, fiscal burdens (tax wedges and administrative costs) and constraints concerning skilled labour. At the heart of this model is a framework where TFP is endogenous and is generated by knowledge investment decisions of firms and households. Out of the three main endogenous growth paradigms, distinguished by Aghion and Howitt, (2006, 2009)[12], Varga et al (2014) have chosen a semi-endogenous growth model approach on the line of Jones (1995, 2005). This approach avoids the inconsistent scale-effects of the Romer (1990) product-variety model. It states that if the level of the number of scientists engaged in R&D is doubled, then the per capita growth rate of output should also double in the steady state. Furthermore the Romer model would also imply that in the comparison of two countries the GDP of the large country (which dispose of twice as much scientists as the small country) would grow twice as rapid in the steady state as the small country!

Our ambition to evaluate the growth impact of structural reforms in Austria is somewhat more modest. Instead of a DSGE model with two sectors, like in Varga et al. (2014), we construct a simple macro growth model for Austria's aggregate economy, which is able to capture some features of structural reforms. However, one should keep in mind that neither the sophisticated DSGE model approach by Varga et al. nor the rather simple approach in our model is able to capture more subtle goals of modern growth aspects such as sustainable growth – a combination of traditional growth under the restrictions of environmental aspects. Such more sophisticated questions are dealt with in EU's growth project WWWforEurope[13] - led by WIFO - in the context of EU's growth strategy "Europe 2020".

4.1 A semi-endogenous growth model for Austria

Our macro growth model is based on the EU integration model by Breuss (2014A). Whereas the equations of that model are entirely econometrically estimated with data by the European Commission (AMECO data base) over the period 1960 to 2015, the present model approach is a mixture of estimated parameters and calibrated ones. The reason is that some features of structural reforms and market insufficiencies can only be captured with calibrated (assumed)

[12] (1) AK-theory, which is a neoclassical growth model without imposing diminishing returns on capital. (2) Product-variety paradigm (see Romer 1990) in which innovation generates endogenous productivity growth by creating new varieties of products. (3) Industrial organization or "Schumpeterian" growth theory (see Aghion and Howitt 1992, 1998); it works with the Schumpeterian notion of creative destruction by focusing on quality improving innovations which forces obsolete products out of the market. Acemoglu (1998, 2002, 2007) created a new paradigm in which the direction of technological change is also endogenised.

[13] *WWWforEurope* stands for "Welfare, Wealth and Work" and tries to answer the question "What kind of new European growth and development strategy is necessary and feasible, enabling a socio-ecological transition to high levels of employment, well-being of its citizens, social inclusion, resilience of ecological systems and a significant contribution to the global common goods like climate stability" (see: http://www.foreurope.eu/).

parameter values according to growth theory. One could call our growth model a hybrid New Keynesian Growth (NKG) model which primarily focuses on the supply side of the economy. The present growth model is based on data for the period 1960 to 2025. The values up to 2016 are based on the most recent forecast by the European Commission (2014 and AMECO database), the baseline for the next decade (2017 to 2025) are own forecasts (see chapter 3.2). The model is calibrated, estimated and simulated with EViews 8.0.

4.1.1 The supply side

The supply side of the macro growth model consists of a production function, the endogenous explanation of technical progress in the spirit of the semi-endogenous growth models of Jones (1995, 2005). Capital and labour demand and additional labour market as well as equations for the wage-price system conclude the supply side of the model.

The core of the macro growth model is a Cobb Douglas production function (equation (1)) with capital and labour as primary factors of production and technical progress (represented by TFP) as the main growth driver. Considering the features of endogenous growth theory TFP is endogenous. TFP depends on investment in R&D at home and abroad (via spillovers of imported technology) and on the development of labour productivity. The demand for capital is explained by the overall demand of the economy (GDP), by net exports as accelerator and also positively by an indicator of credit conditions. Capital demand reacts negatively on user costs of capital (real interest rate, taxes, subsidies, cost of doing business) and on price mark-ups.

Cobb-Douglas production function

(1) $$Y = A\, K^{1-\alpha}\, E^{\alpha}\ .$$

Y is real GDP, *A* is Hicks-neutral "technological progress" measured by total factor productivity (TFP), *K* is real capital stock, *E* is total employment; the time index has been omitted in all variables. With the output elasticity of labour, $\alpha = 0.7$ the real GDP is calibrated as such that the times series of the actual data for A, K and E over the period 1960 to 2025 can reproduce real GDP (*Y*).

Endogenous technological progress

(2) $$A = A_{t-1}^{\beta}\, RD^{\gamma}\, (RD_{EU}^{\delta 1} * MS_{EU})\ \ (RD_{ROW}^{\delta 2} * MS_{ROW}\,)\, Q^{\varepsilon 1}\, Q_{t-1}^{\varepsilon 2}\ .$$

Technical progress (TFP) (*A*) is – on the line of the semi-endogenous growth theory of Jones (1995, 2005) and the empirical implementation by (Coe and Helpman, 1995; Coe et al., 2009) – endogenously determined by the level of TFP in the past and by the primarily publicly financed investment in R&D (*RD*) in Austria and spillovers from R&D activities abroad (in

the EU and in the rest of the world (RD_{EU}, RD_{ROW})[14]. Labour productivity is part of total factor productivity (Q) and influences therefore positively change in technical progress.

The knowledge production function of technical progress is then calibrated to the actual data over the period 1960 to 2025 by using the following values for the respective elasticities: $\alpha = 0.7, \beta = 0.03, \gamma = 0.007, \delta 1 = 0.003, \delta 2 = 0.002, \varepsilon 1 = 0.30, . \varepsilon 2 = 0.10$. The spillover elasticity is higher for R&D activities in the EU (RD_{EU}) than in the rest of the world (RD_{ROW}). The R&D activities abroad are weighted by the respective import shares for the EU (MS_{EU}) and for the Rest of the World (MS_{ROW}).

Demand for capital

(3) $$K = \frac{(1-\alpha)\, Y\ C^{\epsilon}\, (X/M)^{\theta}}{MC_p^{\vartheta}\left(i_r^{\mu} + t^{\pi} - s^{\rho} + DB^{\sigma}\right)} \quad .$$

The demand for capital stock is derived from the first order condition of the profit maximization problem. In our case the capital stock (K) depends positively on total production (real GDP, Y) and the volume of outstanding credit (C). Additionally an accelerator term is included which relates positively net-exports (X/M) to capital demand. Capital demand is negatively determined by the degree of price mark-up ($MC_p = (1 + mkp)$). Decreasing the mark-up will lead to higher output per capital because it directly affects the steady state level of capital (see Varga et al., 2014, p. 360). A reduction in mark-ups (more competition in the product markets) reduce domestic prices of goods and production factors and hence also increases capital demand. Other cost variables (the user costs of capital) decrease the demand for capital, such as the real interest rate (i_r), the difference between tax and subsidy shares in GDP (t-s) and additionally the cost of doing business, captured by the index "doing business" (DB) by the World Bank (2013)[15]. With the following values of the capital demand elasticities the data are calibrated as such that the equation can reproduce the actual data over the period 1960 to 2025: 1-$\alpha = 0.3$ is the output

[14] In a small open economy some part of domestic technological progress (TFP) results also from spillovers of foreign R&D, embodied in manufacturing imports (see Coe and Helpman, 1995; Coe et al, 2009). This impact increases with the degree of openness of a country. According to Coe and Helpman (1995, p. 871) the elasticity of TFP with respect of foreign R&D would be 0.1 for Austria in the year 1990 (for Germany 0.08; for the USA 0.0.3). Coe et al. (2009) extend their analysis of influences of TFP by including institutional variables. Countries where the ease of doing business (DB; this variable is included in the demand for capital in our analysis) and the quality of tertiary education systems are relatively high tend to benefit more from their own R&D efforts, from international R&D spillovers, and from human capital formation. Strong patent protection is associated with higher levels of total factor productivity, higher returns to domestic R&D, and larger international R&D spillovers. Finally – in an international comparison - the legal system plays also an important role in stimulating TFP.

[15] In the ranking on the ease of „Doing business" (see World Bank, 2013), Austria stood at rank 30. One year later, Austria's rank was corrected to 21 (see World Bank, 2014).

elasticity of capital in the Cobb Douglas production function. $\epsilon = 0.1$, $\theta = 0.05$, $\vartheta = 0.11$, $\mu = 0.01$ and $\pi = 0.7$, $\rho = 1.1$, $\sigma = 0.15$.

The price mark-up for Austria (*mkp*) is assumed to be 20%, therefore our mark-up factor (MC_p) is 1.20 in 2015. This corresponds also with the values given by Varga et al (2014, p. 338). Own estimations for Austria's industry (46 industries) resulted in mark-up ratios (price level over marginal costs) between 1.0 (textiles) and 4.5 (financial intermediation; see Badinger and Breuss, 2005).

Demand for labour

(4) $$E = \frac{\alpha Y}{MC_w^{\tau} \; w_r^{\varphi}} .$$

The demand for total labour (*E*), derived from the first order condition of the profit maximization problem depends on total production (in real GDP, *Y*) and negatively on the wage mark-up ($MC_w = (1 + mkw)$) and the factor price, real wage (w_r). Wage mark-up is an indicator for the bargaining power of trade unions which is very strong in Austria. Therefore we assume a wage mark-up of 50%, hence MC_w is 1.50 until 2015. In contrast to the price mark-up (competition on the goods market) Austria's EU accession to the Single Market did not diminish the power of the trade unions and hence the wage mark-up remained constant. With the following parameter values the variables are calibrated to the actual data over the period 1960 to 2025: $\alpha = 0.7$ is again the output elasticity of labour in the Cobb Douglas production function. $\tau = 0.07$ and $\varphi = 0.8$.

The demand for dependent labour (E_d) is econometrically estimated by relating it to total employment (*E*) and to real GDP (*Y*).

Labour market

The labour market is closed by defining *labour supply* (*LS* = *E* + *U*), where *U* = total unemployment in 1.000 persons.

The phenomenon of *"secular stagnation"*, if the cause should be a long-term decline in population growth – as postulated by Hansen (1938) – could also be analysed with our model as we have included population in the determination of unemployment and hence in the definition of labour supply. A secular decline in population would lead to a stagnation of labour supply and would via the price/wage determination (Philips curve) negatively influence the demand for capital and would lead to a depression or a stagnation in output[16].

[16] Roeger (2014) presenting DG ECFIN's medium-term growth projections to the year 2024 firstly shows that structural unemployment, productivity trends and investment have contributed to persistence of slow growth since the "Great Recession" of 2009. He then analyses the causes for the weak growth performance in DG ECFIN's medium term projections which bear the risk of "secular stagnation". The projections show that the

The *unemployment rate* (u) is derived from Okun's law, i.e. its absolute change (Δu) depends negatively on the growth rate of real GDP ($\dot{Y}/Y$) plus total population.

Labour productivity (Q) is defined as real GDP relative to total employment: $Q = (Y/E)$.

Price and wage system

Domestic prices (P, the deflator of GDP) and its inflation rate is econometrically estimated by an equation which includes a price mark-up factor over unit labour costs (MC_p^{ϑ}), representing the degree of competition in the goods market plus the price spill-over from net imports and the influence of indirect taxes.

Wages per capita (W) and its chance is econometrically estimated with a Phillips curve approach. Wage inflation is determined by a wage mark-up factor (MC_w^{τ}) over domestic inflation, labour productivity (Q) and the inverse of the unemployment rate ($1/u$).

Unit labour costs are calculated as the sum of wages over GDP: $ULC = ((W^*E)/Y)$. Unit labour costs then determine international competitiveness, measured by the real exchange rate (REER).

4.1.2 The demand side

To close the macro growth model supply must be equal demand in equilibrium. That means

(5) $$C+I+X-M = Y=F(K,E).$$

Real Investment (I) is determined already by the capital demand equation (3). Econometrically Investment depends on the change of the capital stock and lagged Investment: $I = f(\Delta K, I_{-1})$. The demand for exports (X) and imports (M) is estimated later in the chapter on foreign trade. That means, that total real consumption (C) is the residual on the demand side of this model. For checking purposes real consumption (C) is also directly estimated by a simple Keynesian consumption function, depending on real disposable income (Y_d) and lagged consumption: $C = f(Y_d, C_{-1})$.

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decline in employment and productivity growth is not just a cyclical phenomenon. It is related to a slowdown in the growth rate of the working-age population, an increase in the non-accelerating wage rate of unemployment (NAWRU) and reduced trend total factor productivity (TFP) growth. However, the largest factor weighing on potential growth is low rates of capital formation. Apart from the slowdown in potential growth, deleveraging pressures are also exerting a negative effect on investment rates. However, using the QUEST model, Roeger (2014) cannot confirm that deleveraging will reduce growth permanently, as sometimes argued in the literature. An important reason for the protracted slowdown in euro area growth was the double-dip nature of the recession (2009 and 2012-2014), which saw the financial crisis followed by the sovereign debt crisis. The second recession, in particular, highlighted the absence of supranational financial assistance mechanism in the euro area as well the need to address powerful fragmentation forces in financial markets.

Welfare indicators

The growth model defines welfare with the indicator of real GDP per capita (Y_{pc}). Other welfare indicators could be the real disposable income (Y_d). The latter depends positively on real GDP (*Y*) and negatively on direct taxes (t_d) and is used in explaining real private consumption.

4.1.3 Foreign trade

The foreign trade is represented by equations for real exports (*X*) and real imports (*M*) of goods and services. Both equations are calibrated, using plausible assumptions on the incomes and price elasticities. Relative prices are measured by the index of the real effective exchange rate, *REER* (source: AMECO database) for Austria relative to 37 industrial countries:

The *real effective exchange rate* is econometrically estimated by the following equation:

(6) $$REER = F(ULC, USD€).$$

REER depends on Austria's unit labour costs (*ULC*) and the US-Dollar to Euro exchange rate (*USD€*). That means that two variable determine Austria's international price competitiveness, a domestic source and the Euro exchange rate.

Exports of goods and services are determined by a calibrated equation. Real exports (*X*) depend on foreign demand, split into GDP of EU-28 (Y_{EU}) multiplied with Austria's EU-28 export share (XS_{EU}) plus GDP for the rest of the world (Y_{ROW}) multiplied with the respective export share (XS_{ROW}). Exports react negatively on relative prices, captured by the real effective exchange rate (*REER*) for 37 industrial countries, taken from European Commission's AMECO data base. An "EU integration" term (INT) should capture further activities of the EU to foster export growth, either by further enlarging the EU or by external impulses like the conclusion of TTIP.

(7) $$X = \frac{[Y_{EU} * XS_{EU} + Y_{ROW} * XS_{ROW}]^{\psi}}{REER^{\omega}} * e^{INT} .$$

The income demand elasticity is set at $\psi = 2.0$, the relative price elasticity at $\omega = 0.5$; the EU integration term (*INT*) is a dummy variable.

Imports of goods and services are also determined by a calibrated equation, using the same elasticities as in the export equation. Real imports (*M*) depend on domestic demand (real GDP, *Y*) and relative prices, captured by *REER* and are also determined by the same term for "EU integration" as used in the export equation.

(8) $$M = Y^{\psi}\ REER^{\omega} * e^{INT} .$$

The *current account balance* is defined as the difference of exports of goods and services with that of imports of goods and services, in nominal terms.

4.1.4 Policy

Two kinds of macro policy are modelled, monetary and fiscal policy. For Austria as a member state of the euro area, short-term interest rates are determined by the ECB.

Monetary policy is modelled via the following Taylor-rule, which allows for some smoothness of the (short-term) interest rate response ($i^{€}$) to the inflation and output gap (in our case GDP growth rates). It is assumed that the ECB sets its target interest rate as follows:

(9) $$i^{€} = r_{€}^{e} + \pi_{€} + \omega_{inf}\,(\pi_{€} - \pi_{TAR}) + \omega_{GDP}\,(y_{€} - y_{TAR}) + \beta_{ilag} i_{-1}^{€},$$

where $r_{€}^{e}$ is the equilibrium real interest rate, $\pi_{€}$ is the inflation rate in the euro area with π_{TAR} its target rate (2%); $y_{€}$ and y_{TAR} are the growth rates of real GDP and its long-run target value (we assume 1.5%). The parameters ω_{inf} (0.51), ω_{GDP} (0.45) and the parameter for the lagged interest rate, β_{ilag} (0.77) are econometrically estimated. $r_{€}^{e} + \pi_{€} = 0.52$.

In the policy simulations, however, we take the ECB short-term interest rate as exogenous given. Then the Austrian short-term interest rates (i_{s}^{AT}) depends then on the interest rate set by the ECB for the euro area ($i^{€}$) plus a term for the domestic inflation rate ($P\%^{AT}$):

(10) $$i_{s}^{AT} = \xi\, i^{€} + \phi P\%^{AT},$$

with ξ = 1.0 and $\phi = 0.5$. This translates to the long-term interest rate (i) which enters as a cost factor into the capital demand equation (3).

Fiscal policy is represented by the *budget balance* (*B*) or net-lending, as the difference of government revenues (taxes, *TX*) over expenditure (*EX*). On the expenditure side we distinguish between government subsidies (*S*), expenditures on R&D (*RD*) and other expenditures (consisting of government consumption, government investment and transfers). Government revenues (*TX*) are made up of direct taxes (on capital and labour), indirect taxes (taxes on consumption, value added taxes), and the rest of government revenues. Both tax categories are explained by nominal GDP.

The dynamics (change) of the *public debt* to GDP ratio (Δ*D*) is calculated with the public debt dynamics equation

(10) $$\Delta D_t = PD_t + (i - \left(\dot{Yn}/Yn\right) D_{t-1} + SF_T,$$

where *PD* is the primary budget deficit in % of GDP (net-lending minus interest payments on the public debt), *i* is the long-run nominal interest rate, *Yn* is nominal GDP, and *SF* is the stock-flow adjustment in % of GDP.

4.2 The impact of alternative growth scenarios

Our hybrid macro growth model is able to reproduce the actual data over the period 1960 to 2025. As our model is based on the ideas of the modern, endogenous growth theory it should also be able to answer the question, which policy change can lead to more growth. The modern growth theory has taught us that shocks to the model do not permanently increase economic growth, but it only increases the level of real GDP to a new steady state. This has to be kept in mind, when analysing the following simulations results.

Varga et al. (2014) concentrate their analysis on the growth impact of some aspects of "structural reforms" in the four southern countries of the Euro area (Greece, Italy, Spain and Portugal), first, on the *goods or product market* (reducing price mark-ups; reducing firm's entry costs), second, on the *labour market* (tax shift from labour to consumption) and finally some aspects of *knowledge & innovation* (R&D subsidy; decreasing the share of low-skilled workers; increasing the share of high-skilled workers). Varga and in 't Veld (2014A, 2014B) make the same exercise for all 28 EU Member States.

In contrast, we try to broaden the analysis of possible sources of growth, first by looking at the growth impact of some aspects of "structural reforms". Then we analyse the possible growth effect of a reorientation of Austria's foreign trade from traditional EU markets to the more dynamic non-EU markets (increased participation in the globalisation). Finally we analyse how our model behaves in the field of traditional demand policy areas, in monetary and fiscal policy.

4.2.1 Structural reforms in the product and labour market

The first exercise to find growth for Austria without impeding the fiscal stance is the simulation of some structural reform measures on the product and labour market.

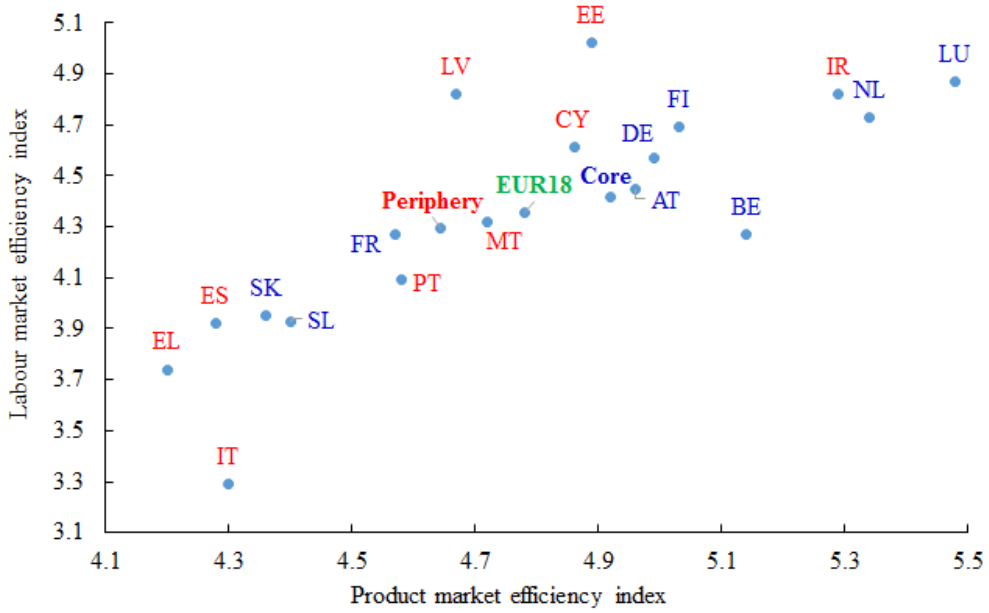
The World Economic Forum (2014) measures regularly goods (or product) market and labour market efficiency in a sub-index[17] of its Global Competitiveness Index (GCI). Accordingly, the euro area countries show a clear north-south divide (see Figure 6). Whereas most of the periphery countries in the south are inefficient in both category, the northern countries (the core) have already reached a high level of market efficiency. Interestingly, the index values did not change very much since 2008. However, the GFC 2008/09 brought some standstill in

[17] The sub-index *„goods market efficiency"* is calculated by evaluating several indicators (Number of procedures to start a business; number of days to start a business; agricultural policy costs; prevalence of trade barriers; trade tariffs (% duty); prevalence of foreign ownership; business impact of rules on FDI; burden of customs procedures; imports as % of GDP; degree of customer orientation; buyer sophistication); *"labour market efficiency"* is evaluated with a series of indicators (Cooperation in labour-employer relations; flexibility of wage determination; hiring and firing practices; redundancy costs, weeks of salary; effect of taxation on incentives to work; pay and productivity; reliance on professional management; country capacity to retain talent; country capacity to attract talent; women in labour force (ratio to men)).

the core, but efficiency had to be improved in the periphery under the pressure of the conditions dictated by the Troika in the context of the rescue programmes.

Austria belongs to one of the best performers. Nevertheless, there is always room for improvement. The possible impact of further improvements are simulated with our growth model.

Figure 6: Product market and labour market efficiency in the Euro area
(WEF-Index 2014/15)



Source: World Economic Forum (2014): WEF-Index: 1 = min, 7 = max.

Product market reforms:

1) Market competition

Structural reforms need time. Therefore, all measures to reform the goods and labour market as well as the improvement in R&D investment are implemented into the model gradually over a period of ten years.

As it is standard in general equilibrium models we simulate in our macro growth model for Austria an improvement in market competition by a negative price mark-up shock. With Austria's accession to the EU in 1995 the participation in EU's Single Market increased the competitive pressure in the Austrian economy leading to a decline in price mark-ups (see Breuss, 2014A). In our model the mark-up factor came down from 1.5 in 1994 to 1.4 in 1995 and further because of the additional competitive pressure in the EMU in 1999 (1.3). The grand EU enlargement, starting in 2004 added via an enlargement of the Single Market led to a further decline in the mark-up to 1.2.

In the following simulation it is assumed that the price mark-up, due to national reform policy measures to improve market competition declines gradually by 1% per year to reach 1.08 in the year 2025.

As a result of reducing the price mark-up the level of real GDP could be increased by 0.3 percentage points in the short-run and would gradually increase to 1% in 2025 (see Table 1 and left part of Figure 7). As already mentioned, in a growth model a permanent shock does lead to a permanent increase of the output level, but not to a permanent increase of the output growth rate. Therefore, the price mark-up shock starting in 2016 leads to a short-term jump in the real GDP growth rate of 0.3% and then adjusts to the steady state growth rate (which is equivalent with the baseline growth rate scenario to 2025; right part of Figure 7).

Table 1: GDP, employment and budgetary effects of structural reforms

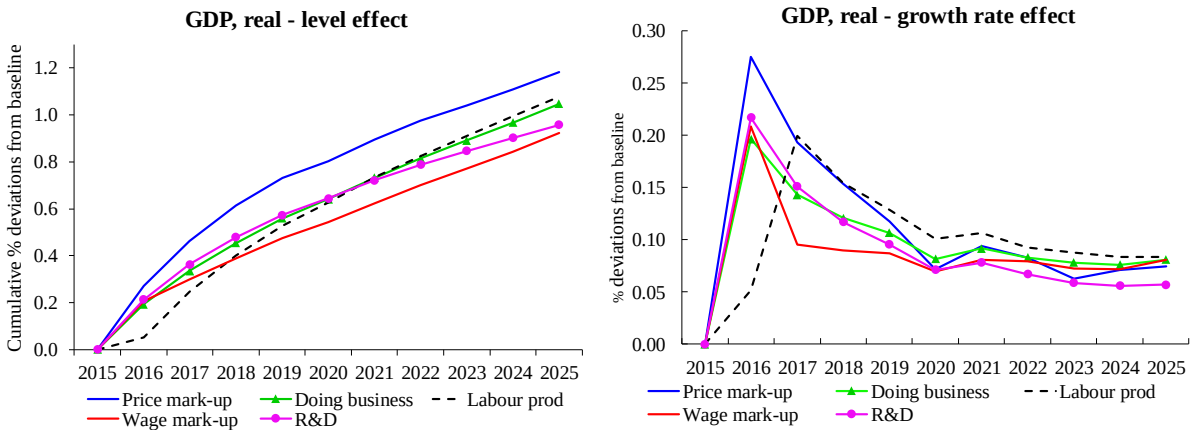
Policy impulse	Size		**GDP, real** (cum. % deviation from baseline)			**Employment** (cum. % deviation from baseline)			**Public debt** (% GDP deviation)		
			2016	**2017**	**2025**	**2016**	**2017**	**2025**	**2016**	**2017**	**2025**
Product market											
Reducing price mark-up	-10.0	pp.	0.3	0.5	1.2	0.2	0.3	0.3	-1.8	-2.2	-5.8
Doing business	10.0	pp.	0.2	0.3	1.0	0.2	0.3	0.5	-1.7	-2.0	-5.5
Labour market											
Labour productivity	1.0	pp.	0.1	0.2	1.1	0.0	0.1	0.0	-1.5	-1.9	-6.2
Reducing wage mark-up	-10.0	pp.	0.2	0.3	0.9	0.2	0.3	1.1	-1.7	-2.0	-5.6
Knowlege and innovation											
R&D investment	1.0	%GDP	0.2	0.4	1.0	0.2	0.3	0.4	-1.7	-1.8	-0.6
Total			0.9	1.7	5.2	0.8	1.3	2.3	-8.5	-10.0	-23.8

The structural reform measures are implemented gradually over a period of ten years to reach in 2025 the numbers indicated in the column "Size".
Source: Simulation with the Austrian macro growth model

More competition in Austria's product market would not only stimulate output but also employment (see Table 1 and Figure 8). The number of total employment could be increased by 0.3%. As a consequence of more output and employment, the unemployment rate could go down by 0.1%.

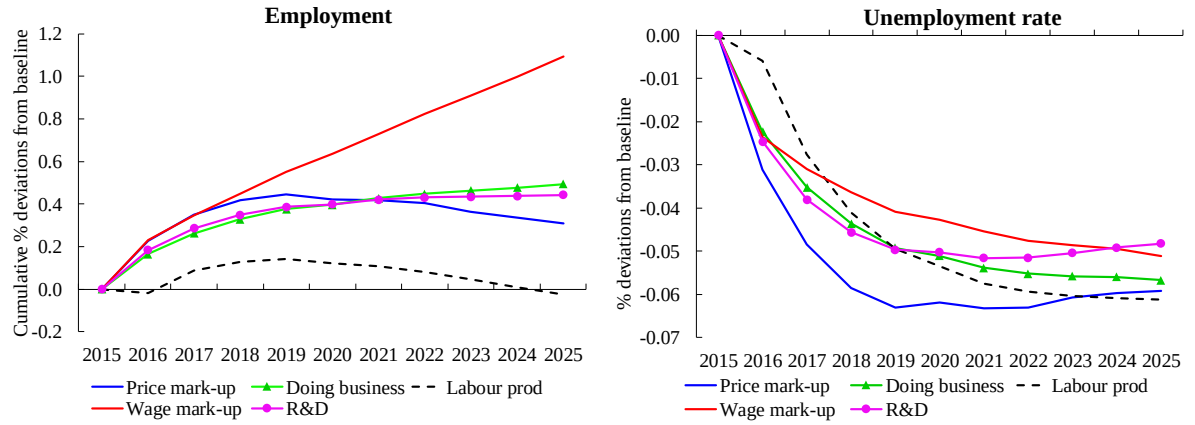
Additionally, such internal structural change would not impair the fiscal stance, in contrast it would relief budgetary pressure and would improve Austria's public debt position (see Figure 9). A reduction of price mark-ups dampens inflation and also the nominal interest rates (see Figure 10). As the inflation declines somewhat stronger than the interest rates, this implies a slight increase of real interest rates.

Figure 7: GDP effects of structural reforms



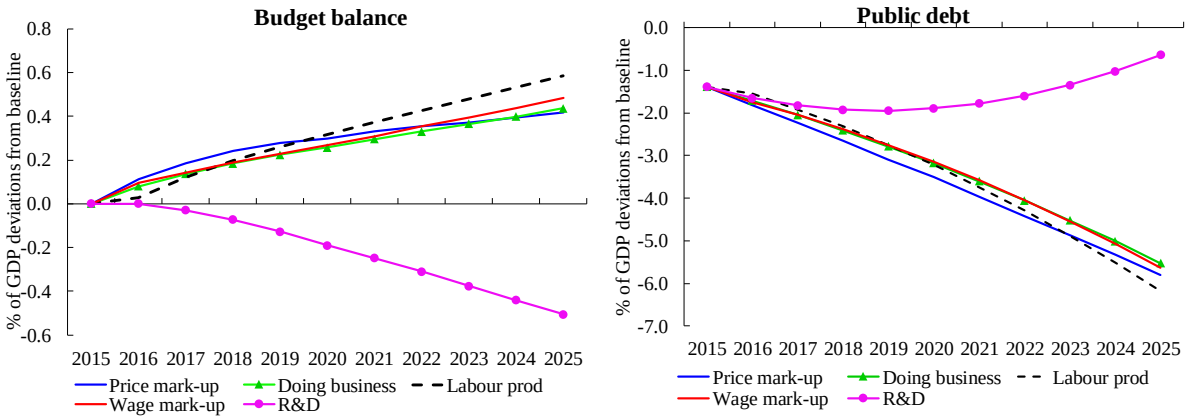
Source: Simulation with the Austrian macro growth model

Figure 8: Labour market effects of structural reforms



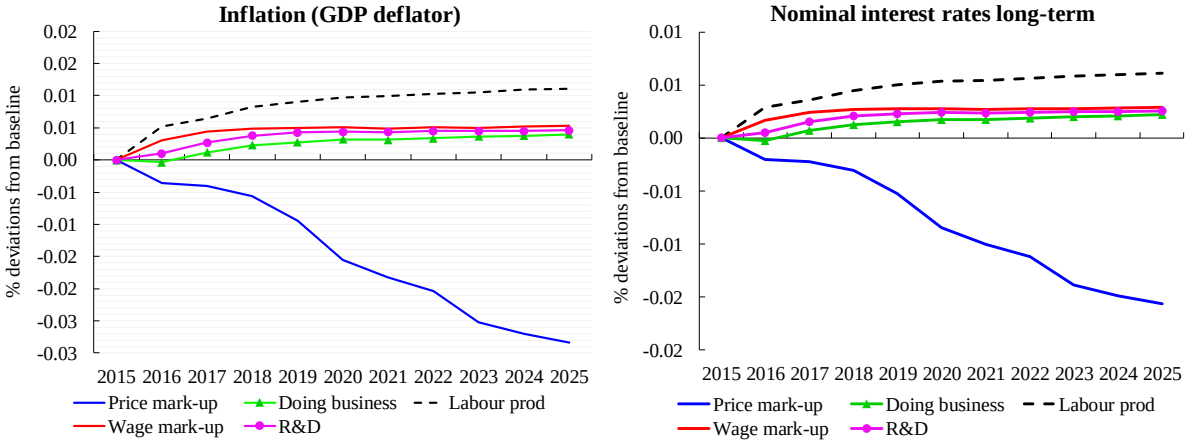
Source: Simulation with the Austrian macro growth model

Figure 9: Budgetary effects of structural reforms



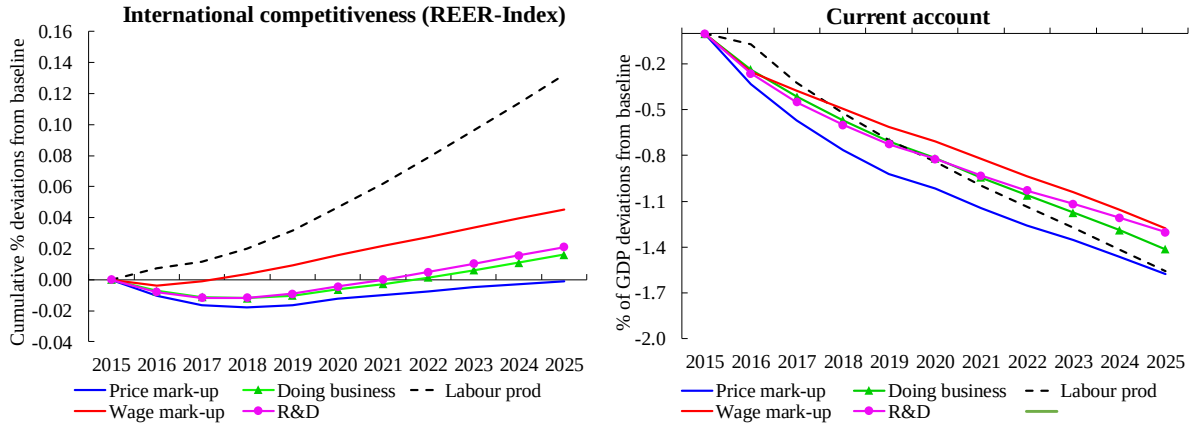
Source: Simulation with the Austrian macro growth model

Figure 10: Inflation and interest rate effects of structural reforms



Source: Simulation with the Austrian macro growth model

Figure 11: International competitiveness effects of structural reforms



Source: Simulation with the Austrian macro growth model

More competition in the Austrian product markets leads to lower inflation (currently, Austria is leading concerning inflation rates in the euro area) which – via sinking unit labour costs improves the international competitiveness, measured by real effective exchange rates (REER). Nevertheless, the current account balance deteriorates due to a stronger increase of imports than exports. That means that the income effect (increase of Austria's GDP) of imports outbalances the relative price effect via REER in the exports (see Figure 11).

Box 1: Can structural reforms help Europe at the zero lower bound?

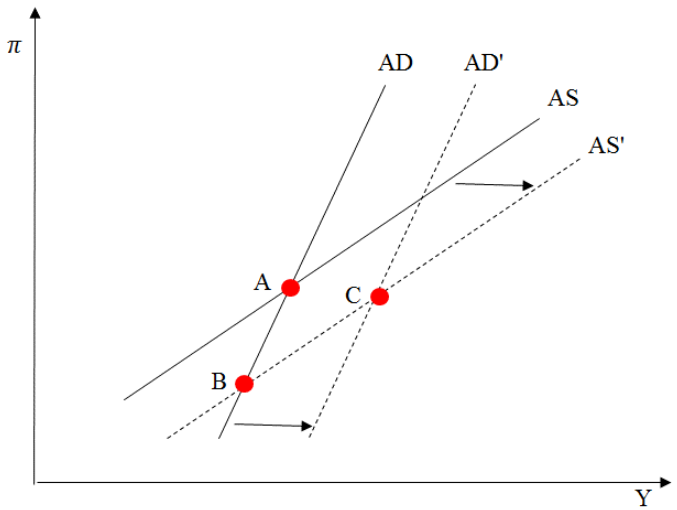
Recently, Eggertsson et al (2014) have initiated a debate about the possible growth effects of structural reforms in times of a crisis. They question whether in a crisis that pushes the nominal interest rate to its lower bound (zero lower bound, ZLB) – like the ECB at present - , structural reforms may support economic activity in the short run, or whether they might well be contractionary.

The intuition for this argument can be illustrated in the following Figure B1. Following Eggertsson et al. (2014, pp. 6-7) a prototype New-Keynesian model can be characterized by two equations, one for output (Y) and one for inflation (π). The equilibrium corresponds to the intersection of the aggregate supply (AS) and the aggregated demand (AD) "cures". When the ZLB binds, the aggregate demand curve becomes upward-sloping, as higher inflation stimulates demand through lower real interest rates (When the ZLB does not bind, the AD curve is horizontal in a zero-inflation targeting regime; see also Eggertsson and Krugman (2012)).

According to Eggertsson et al. (2014) structural reforms are interpreted as policies that aim at increasing efficiency in the product and labour market through lowering entry barriers, a reduction of price and wage mark-ups as well as a removal of restrictions on working hours and privatization of government-owned enterprises firms.

Figure B1 shows the impact of permanent structural reforms on short-term output and inflation. A product or labour market liberalization generates two effects. *First*, it shifts the AS curve down to AS', as firms can produce more output for any given level of inflation. Surprisingly, this effect turns out to be contractionary in the short run. At the ZLB, reforms amplify deflationary pressures, resulting in a higher real interest rate and contracting aggregate demand. Given that the interest rate is stuck at zero (or near zero), the ECB cannot provide enough monetary stimulus to offset this effect and output declines.

Figure B1: Short-run equilibrium at the ZLB under structural reforms



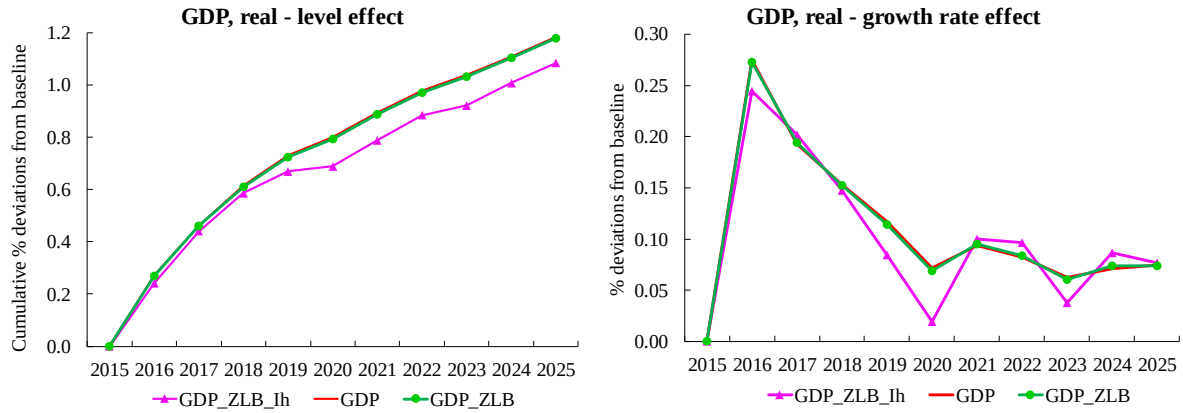
π = inflation; Y = output

Source: Eggertsson et al. (2014), p. 7.

However, reforms also have a *second* effect on short-run output, thus shifting the aggregate demand schedule (AD) outward to AD'. As structural reforms increase permanent income, output and inflation move up in the short term as well. Thus, depending on the relative strength of these two effects, reforms may be contractionary or expansionary in the short run. If structural reforms do not have much "credibility" (i.e. agents

Expect a policy reversal at some point in the future, the AS curve shifts down whereas the AD curve does not change, and the reforms are clearly contractionary (point B in Fig. B1). In contrast, ambitious reforms that are gradually implemented and become more credible over time are associated with large permanent income effects, shifting the AD curve more than the AS curve (point C in Fig. B1).
The question of which effect dominates is ultimately quantitative. In simulations with a calibrated two-country DSGE model of a monetary union Eggertsson et al. (2014) come to the conclusion that structural reforms in Europe have a contractive effect on short-term output.

Figure B2: GDP effects of structural reforms with and without binding ZLB



ZLB = scenario with interest rates in the euro area and in Austria fixed at the baseline (zero) lower bound; GDP_ZLB_Ih = ZLB scenario with higher interest rate elasticity in the capital demand equation; GDP_ZLB = ZLB scenario with the same lower interest rate elasticity as in the structural reform scenario; GDP = structural reform scenario (reducing price mark-up) with flexible interest rates.
Source: Simulation with the Austrian macro growth model

Economists at the European Commission (see Vogel, 2014) veto against the Eggertsson results. They agree with the theoretical possibility that the short-term output effects of reforms can be negative because in a macroeconomic environment in which the zero bound on monetary policy rates is temporarily binding, ruling out further standard monetary expansion to accommodate supply-side policies. However, negative effects are small in a model environment such as QUEST that incorporates a larger number of transmission channels. Short-term effects also depend on the specific reform measures. QUEST results, furthermore, do not support the idea that delaying structural reforms for the foreseeable future would improve economic conditions at the zero bound. The policy implications are that warnings of adverse effects from structural reforms at the current juncture appear to overemphasise potential short-term costs and that postponing reforms is not a good alternative.
At the binding ZLB scenario, the short-term impact of the structural reforms (a combination of a 1 pp price and wage mark-up reduction in the euro-area periphery's non-tradable (services) sector) on output is also slightly negative in the QUEST model in the short-run (the difference to the baseline without the ZLB assumption is only 0.1 ppt), but the effect is one order of magnitude smaller than in Eggertsson et al. (2014).
Simulating the impact of structural reforms with our own growth model (here we use only the scenario with a reduction of price mark-up like in the previous section) under the assumption that the ECB and hence also Austria is unable to change the interest rates because they are already binding at the ZLB we get results which are not very much different from the structural reform scenario with flexible interest rates. Only, if one increases the interest rate elasticity in the equation of capital demand, the results are comparable to those of Eggertsson

et al. (2014) and Vogel (2014). However, in the ZLB scenario – because the real interest rate rises faster than in a scenario with flexible interest rates – the output effect is not negative in the short-run (as in Eggertsson et al. (2014)) but only smaller in the short-run and falls cumulatively back of the non-ZLB scenario (like in Vogel, 2014, pp. 14-15; see Figure B2).

2) Doing business

A further reform step could consist in reducing the entry costs of doing business. Austria is in this respect still not in a top position in international comparisons. Entry barriers are measured by the World Bank's Doing Business indicator. The World Bank makes regularly rankings concerning the "Ease of Doing Business" for 1989 countries. In the 11th issue "Doing Business 2014" (see World Bank, 2013) Austria has been ranked at place 30. In the meantime the World Bank has corrected this rank to 19. In the 12th issue (see World Bank, 2014), Austria's "Ease of Doing Business Rank" has deteriorated to 21.

In our model the entry costs are approximated with World Bank's "Doing Business" indicator. Our model is calibrated for Austria with the rank 21 in the year 2015, and then we simulate an improvement of 10 percentage points over the next ten years to reach rank 18.9 in 2025.

Depending on the assumed elasticity in the capital demand equation (3) the growth effects are accordingly. In our model we assumed a relative low elasticity. Nevertheless, the output impulses are in the same order of magnitude as the simulations of Varga et al. (2014) for the southern periphery countries of the euro area. In Austria, the level of GDP would increase after 10 years by 1% (see Table 1 and Figure 7). This value is similar in the Varga et al. simulations for Italy (0.8%); his GDP effects are lower for Portugal (0.1%) and Spain (0.2%), but higher for Greece (2.4%) which of course has the greatest need for catching up concerning doing business.

Labour market reforms:

Also concerning the labour market efficiency Austria ranks above average of the euro area core (see Figure 6). Nevertheless, one could also think of further improvements towards a more flexible labour market structure. A forerunner in this respect is Germany with its Hartz IV reform.

1) Make labour more productive

With a mixture of labour market policies (flexible working hours; short-time working etc.) one could improve labour productivity.

In our simulation experiment we assumed that such an improvement in labour productivity takes place in the form of a level increase of 1% within ten years. This would lead to short-run

level increase of real GDP of 0.1% to 0.2%, increasing cumulatively until 2025 to 1.1% more GDP (see Table 1 and Figure 7). Higher output would lead to only a slight and short-term increase in labour demand and a reduction in unemployment (see Figure 8). The growth enhancing effect of more efficiency in the labour market would come with no costs for the budget (see Figure 9). Higher labour productivity transforming into higher wages would slightly deteriorate international price competitiveness. This together with the negative income effect of rising imports would lead to a deterioration in the current account (see Figure 11).

2) More market power in the labour market

In analogy to the desire for more competition in the goods market (reduction of price mark-up in the demand for capital equation) we model the wish to more flexibility in the wage bargaining process via a reduction in the wage mark-up (in the demand for labour equation). In the Austrian context with its traditional strong Social Partnership with strong employer's representatives and equally strong trade unions, a reduction of the bargaining power of the latter (measured by the term wage mark-up) would be a revolution and hence has less chances of being realized.

Nevertheless we simulated a reduction in the wage mark-up by 10 percentage points over ten years, from 1.5 in 2015 to 1.35 in 2025. This would imply by our model that the wage costs go down and the demand for labour goes up which increases output. The level of real GDP would increase after 10 years by 0.9%, employment by 1.1% (see Table 1 and Figures 7 and 8). Again this would be a relief for the public sector, reducing the budget deficit and improving the public debt position. International competitiveness, however would deteriorate slightly.

Knowledge and innovation:

The core of the endogenous growth literature deals with the impact of knowledge and innovation on output growth. According to our TFP equation R&D investment (which is done in Austria primarily via public expenditures) should stimulate GDP growth via the term technical progress, approximated by total factor productivity (TFP).

Austria had already profited very much from a better access to research programmes of the EU (up to the 7th Frame Work Programme) as an EU member. This stronger participation helped Austria to increase its R&D expenditure more than it could do otherwise since Austria's accession to the EU in 1995 and contributed considerably to the EU integration effects (see Breuss, 2014A).

Starting with a R&D quota of 2.95% of GDP in 2015 we assume a further level increase by one percentage point of GDP cumulating over a period of ten years to reach 4% of GDP instead of 3% in 2025 in the baseline assumption.

More investment in R&D could increase the level of real GDP by 1/4% in the short-run and by 1% of GDP in the medium- to long-run in 2025. This leads to more employment and to a reduction in unemployment (see Table 1 and Figure 7).

Expenditures on R&D have a considerable impact on GDP growth, however – as they are primarily financed out of the budget in Austria – this growth strategy would be the only structural reform strategy which is not without fiscal costs (see Figure 9). In our model we assumed that total R&D investment is publicly financed. One could reduce the budgetary burden if one would split the financial burden of R&D investment between the private and public sector. According to the OECD (2014B) the share of publicly financed R&D expenditures amounts to around 35% in Austria (compared to only 25% in Switzerland). A further source of growth enhancing structural change could be tapped if Austrian firms - like in more advanced economies, e.g. Switzerland - could be motivated to take over more costs of R&D expenditures.

Overall effects of structural reforms:

Our overall results are – although we apply another model and analyse different indicators of structural reforms which are simulated differently (we simulate assumed changes in structural indicators directly, the studies by the European Commission use a benchmark technique (see our Table 1 versus Table 1 in Varga and in ‘t Veld (2014B, p. 7)[18] - quite similar to those of Varga and in ‘t Veld (2014B) with the QUEST model of the European Commission. If all five measures to reform the Austrian economic structure in the goods and labour markets (see Table 1) would be implemented over a period of the next ten years, the level of real GDP could be increased by 1% to 1 ½% in the years 2016 and 2017. The GDP effect would cumulate to 5 1/4% in 2025. This would allow employment to grow by more than 2% in the next ten years. And, most importantly, the budget could be stabilised by reducing public debt considerably.

[18] Varga and in ‘t Veld (2014B, p. 7) use the following „structural indicators: 1*) Market competition* (Services sector markups), 2) *Market regulation* (Entry costs), 3) *Tax reform* (Labour to consumption tax revenue ratio), 4) *Skill enhancing reforms* (share of high-skilled; expenditure on high-skilled education; share of low-skilled; expenditure on medium-skilled education), 5) *Labour market reforms* (Female non-participation: low-, medium- and high-skilled; low-skilled male non-participation; elderly non-participation: low-, medium- and high-skilled; ALMP (active labour market policy) (% of GDP over unemployment share); benefit replacement rate, 6) *R&D measures* (R&D tax credit rates). The performance of these structural indicators for each of the 28 EU Member States are then compared with the 3 average best performers. Scenarios are then simulated in which half the gap vis-à-vis the best performers is closed over time.

4.2.2 Reorientation of foreign trade policy – more globalisation

Austria, after EU accession in 1995 has concentrated its exports primarily on the Single Market which – due to the grand EU enlargements, starting in 2004 – steadily increased. In particular, the opening up of Eastern Europe in 1989 and the following EU enlargements offered Austria's export industry new chances in the emerging market in Eastern Europe. This contributed considerably to the EU integration effects of Austria (see Breuss, 2014A).

More globalisation:

After the GFC 2009 and the following stagnation in Europe, no great further growth impulses from EU's Single Market can be expected in the near future. This should force the Austrian industry to reorient its market strategy. Instead of exporting to the stagnating European markets more effort should be put into a reorientation towards the more faster growing markets outside Europe, the BRICS and other developing countries.

In the following globalisation experiments we simulate four possible strategies: 1) Either more EU integration via enlargement (which was excluded for the near future by the new President of the European Commissioner, Jean-Claude Juncker) or a successful conclusion of TTIP (see Breuss, 2014B and 2014D): 2) A reorientation from the EU to Non-EU export markets; and 3) A devaluation of the Euro vs the US-Dollar; and 4) A stronger participation in EU Research Programmes.

Table 2: GDP, employment and budgetary effects of more globalisation

Policy impulse	Size		**GDP, real** (% deviation from baseline)			**Employment** (% deviation from baseline)			**Public debt** (% GDP deviation)		
			2016	**2017**	**2025**	**2016**	**2017**	**2025**	**2016**	**2017**	**2025**
More globalisation											
EU enlargement/TTIP	10.0	pp.	0.0	0.1	0.8	0.0	0.0	0.2	-1.5	-1.5	2.2
Globalisation (EU export share)	-3.0	pp.	0.1	0.2	0.9	0.1	0.1	0.2	-1.5	-1.5	2.7
Euro devaluation											
Euro vs USD	-10.0	pp.	0.2	0.2	0.1	0.1	0.1	0.0	-1.5	-1.5	-0.5
EU research											
R&D spillovers	1.0	%GDP	0.1	0.2	0.5	0.1	0.2	0.2	-1.6	-1.9	-4.2
Total			0.4	0.7	2.4	0.3	0.4	0.7	-6.1	-6.4	0.1

With the exception of the scenario "Euro devaluation" all policy impulses are set gradually over a period of ten years.
Source: Simulation with the Austrian macro growth model

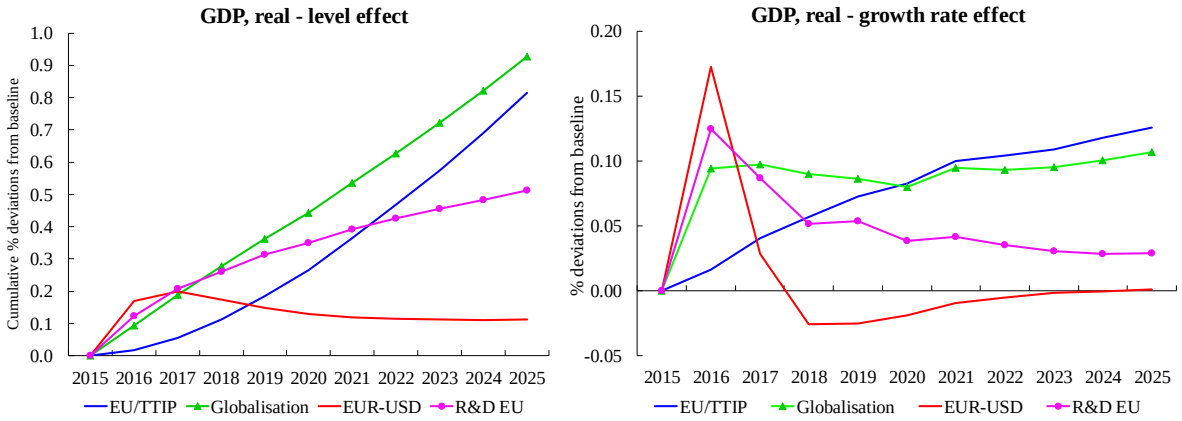
1) More EU integration or TTIP

With an EU integration dummy variable which stands at 1.50 in 2015 we simulate a further impulse either from more EU integration (either from deepening or enlarging the EU) or from a successful conclusion of the TTIP. For this purpose we increase the integration dummy *INT*

– which play a role in the trade equations – by 1% per year to reach 10% increase after ten years and a level of 1.65 in 2025.

As a result, the level of real GDP increases by 0.8% after ten years and gives some impulse for more employment. Again this growth strategy would not hamper the budget but would act as a relief – at least in the short- to medium-run (see Table 2 and Figure 12).

Figure 12: GDP effects of more globalisation



Source: Simulation with the Austrian macro growth model

2) Globalisation

The opening up of Eastern Europe in 1989 and the following EU enlargements gave Austria a chance to participate in the so-called "Mini-Globalisation" towards Eastern European markets. As the outlook for this region is rather gloomy due to uncertainty in the context of the Ukraine-Russia crisis, Austria could reorient its exports and increase the export radius towards the faster growing markets outside Europe (BRICS etc.).

In this simulation exercise we assume that Austria succeeds to shift its export share from EU to Non-EU markets by 0.3 percentage points per year, starting in 2016. After ten years this would result in an EU export share of only 66% instead of 68% in 2015.

This would lead to a considerable permanent impulse for real GDP. Its level would increase cumulatively by 0.8% in 2025 (see Table 2 and Figure 12). Also this growth strategy would have positive effects in the labour market and for the budget and would decrease the debt burden – at least in the short- to medium-run.

Euro devaluation:

A standard model exercise is the change of the exchange rate. We assume that the Euro devaluates against the US-Dollar by 10% in 2016.

This would lead to a level shift of real GDP by 0.2% in the short-run, but then this growth impulse would gradually decline. The positive employment effect would therefore be small, but one could expect a reduction of public debts (see Table 2 and Figure 12).

More participation in EU research programmes:

Austria already participated to a considerable degree at the EU research programmes (up to the 7th Frame Work Programme). If one assumes that the EU will further direct its budgetary means towards more investment in knowledge and innovation (as is already planned in the "Multiannual Financial Framework 2014-2020 (see European Commission, 2013[19]) and Austria would participate in this development it could gain external growth impulses via spillovers of R&D investment in the EU (implemented into the TFP equation (2)).

We simulate a gradual increase of 0.1 percentage points in R&D in the EU which would reach a R&D ratio to GDP of 3.3% instead of 2.3% in the baseline in the year 2025.

As a result Austria would could increase its real GDP via the spillover effect in the TFP equation by 0.5% in the year 2025. This would also be positive for the labour market and would decrease the debt to GDP ratio (see Table 2 and Figure 12).

4.2.3 Traditional monetary and fiscal policy

Many Keynesian oriented experts advocate in the present desperate economic situation in Europe more public spending, either from potent EU member states (like Germany[20]) or at EU level (see Juncker's EUR300 bn investment plan). The problem with Keynesian demand policy is that it has only a short-run impact on GDP and jobs but leads to an accumulation of public debt which is already too high.

In the following we simulate some aspects of the traditional aggregated demand policy via monetary and fiscal policies.

Monetary policy:

We analyse only two scenarios of monetary policy, one concerns the credit policy, the other a traditional decrease of ECB interest rate.

1) Credit easing

After exhausting the traditional monetary policy measures (interest rate decline to the zero bound level), the ECB – since the Euro crisis – embarked (like the Fed in the United States

[19] Within the "Multiannual Financial Framework 2014-2020" the share of the budgetary expenditures for chapter 1 (*Europe 2020* strategy for smart and inclusive growth) is increased from 46% in 2015 to 49% in 2020 of total commitment appropriations (for the sub-chapter 1a "Competitiveness for growth and jobs" the share increases from 12% to 15%).

[20] In 't Veld (2014) and D'Auria et al. (2014) demonstrate with the QUEST model that a fiscal stimulus (public investment of 1% of GDP) in the core euro area countries (in particular in Germany) would lead to relatively high spillovers to other euro area countries, boosting GDP by between 0.2 and 0.3 %.

and the Bank of Japan) into unconventional monetary policy measures (TLTR operations; outright purchases of asset-backed securities (ABS)). Starting in 2015, the ECB will also embark into quantitative easing (QE) in order to make the transmission of loose monetary policy to the real sector better working. That measures are expected to contribute to further credit easing. Whether the shortening of credit supply ("credit crunch") is not only a reaction to weak demand is an open question.

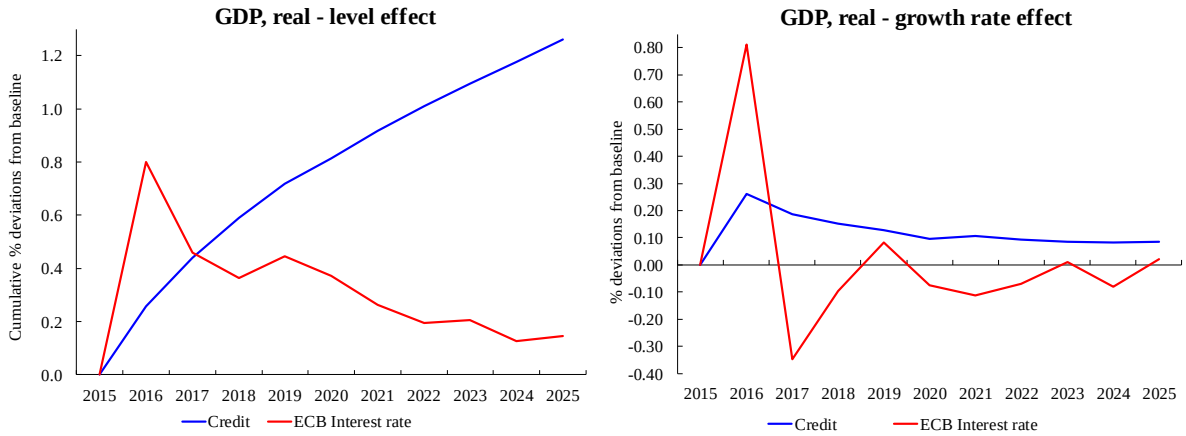
With our growth model we simulate a graduate increase credit supply by 10% over the next ten years. Credit enters the capital demand equation (3) as a positive factor for investment. According to our assumption concerning the credit elasticity the level of GDP could be steadily increased by 1.3% until 2025 (see Table 3 and Figure 13). And there would be no costs for the budget.

Table 3: GDP, employment and budgetary effects of monetary and fiscal impulses

Policy impulse	Size		GDP, real (% deviation from baseline)			Employment (% deviation from baseline)			Public debt (% GDP deviation)		
			2016	**2017**	**2025**	**2016**	**2017**	**2025**	**2016**	**2017**	**2025**
Monetary policy											
Credit	10.0	pp.	0.3	0.4	1.3	0.2	0.3	0.6	-1.8	-2.2	-6.3
ECB interest rate	-1.0	pp.	0.8	0.5	0.1	0.7	0.3	0.0	-0.4	-1.0	-5.1
Total monetary policy			*1.1*	*0.9*	*1.4*	*0.9*	*0.6*	*0.5*	*-2.2*	*-3.2*	*-11.4*
Fiscal policy											
Direct taxes	-1.0	%GDP	0.7	0.5	0.2	0.6	0.3	0.0	-1.4	-0.5	5.7
Subsidy	1.0	%GDP	0.6	0.4	0.2	0.5	0.3	0.0	-1.2	-0.3	6.0
Indirect taxes	-1.0	%GDP	0.0	0.3	0.1	-0.1	0.1	-0.1	-0.3	0.4	7.9
Total fiscal policy			*1.3*	*1.2*	*0.5*	*1.0*	*0.7*	*-0.1*	*-2.9*	*-0.4*	*19.7*
Total			2.4	2.1	1.9	1.9	1.3	0.4	-5.1	-3.6	8.2

Credit growth is implemented gradually over ten years. All other policy impulses are implemented to the full extent already in the year 2016.
Source: Simulation with the Austrian macro growth model

Figure 13: GDP effects of monetary impulses



Source: Simulation with the Austrian macro growth model

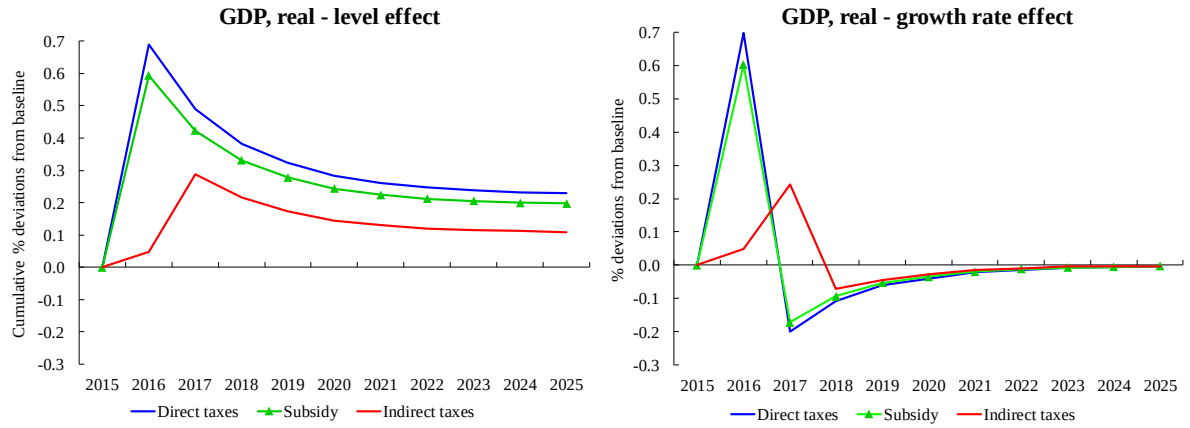
2) ECB interest rate

We assume an immediate reduction of ECB's target interest rate by 1 ppt. in 2016. This translate directly into the short term interest rates in Austria. With some lag this enhances a decline of Austria's long-term interest rate. The interest rate shock leads to a short-term level increase of real GDP by 0.8%, however, the impulse declines rather rapidly (see Table 3 and Figure 13). Jobs could be created and the public debt to GDP ratio would decline.

Fiscal policy:

As the initial conditions in Austria include levels of budget balances and public debt in relation to GDP, that already surpass the rules of the Stability and Growth Pact (Six Pack) and those of the Fiscal pact, Austria's fiscal policy is constrained. Nevertheless, we simulate for demonstration purposes how the model works when shocked by measures of fiscal expansion. We reduce direct and indirect taxes and increase subsidies[21]. This policy impulses (in the order of 1% of GDP) are implemented immediately and to the full extent in 2016.

Figure 14: GDP effects of fiscal impulses



Source: Simulation with the Austrian macro growth model

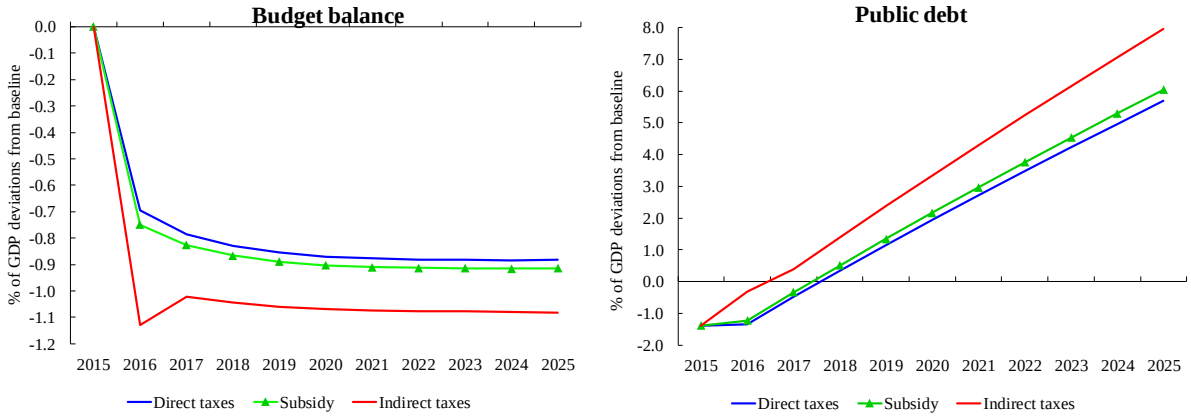
1) Direct taxes

We relief the economy (consumers and investors) by a reduction of the burden of direct taxes by around 1% of GDP (or EUR 4.5bn). In our model simulations this could increase real GDP by 0.7% in the short run (see Table 3 and Figure 14). However, there are direct costs of this

[21] Varga and in 't Veld (2014B) simulate in the context of structural reform scenarios also changes in the tax revenue structure: labour to consumption tax revenue ratio. In Austria this ratio is 2.4 and hence far away from the ratio 0.9 of the 3 best performer in this category. In a more comprehensive study about the reform of the tax structure in general in the EU, Burgert and Roeger (2014) highlight some attractive properties of tax shifts from labour to consumption. Such a tax reform has positive effects on growth and on the external balance. The extent to which a fiscal devaluation is growth enhancing importantly depends on the extent to which benefit and transfer recipients are compensated for their purchasing power losses owing to the consumption tax increase.

"tax reform" (see Table 3 and Figure 15). The budget deficit would increase by around 1% of GDP, public debt to GDP ratio would go up by nearly 6% of GDP.

Figure 15: Budgetary effects of fiscal policies



Source: Simulation with the Austrian macro growth model

2) Subsidy

When stimulating the economy by increasing subsidy by around 1% of GDP, the GDP effect would be only slightly below that of a reduction of direct taxes. The level of real GDP would increase by 0.6% (see Table 3 and Figure 14). The budgetary costs would be similar to those of a reform of direct taxes (see Table 3 and Figure 15).

3) Indirect taxes

A relief of consumers by a reduction of indirect taxes amounting to 1% of GDP would have lagged and also lower effects than a relief of direct taxes by the same amount. The reason is that indirect taxes would have direct price effects and would, hence increase the purchasing power of consumers (see Table 3 and Figure 14).

Overall, fiscal policy measures (the whole package of tax reliefs and subsidy increases) would – at least in the short-run - have higher GDP effects than the monetary policy measures here applied (see Table 3). However, this would come at considerable high budgetary costs. In the light of the EU fiscal rules fiscal policy stimuli would be no real option to generate growth in the medium run.

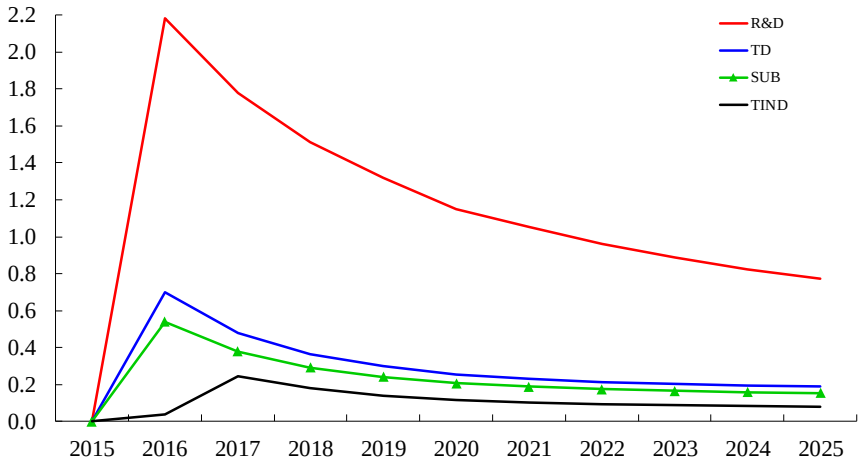
4) Fiscal multipliers

In order to check whether our growth model works roughly well also in the context of fiscal shocks we check the outcome of our policy interventions in terms of fiscal multipliers. Additionally to the impact of tax reforms (decrease of direct and indirect taxes) and the increase of subsidies we also examine the fiscal multiplier of the investment in R&D (see

Figure 16). The fiscal multiplier refers to the impact of the fiscal (R&D) impulses on real GDP.

Investing in knowledge & innovation (R&D) would lead to the largest fiscal multiplier. This strategy would – because in our model specification R&D in Austria is fully financed publicly – come with some budgetary costs, but they would be much less than in the case of the traditional fiscal policy shocks (compare Figure 9 with Figure 15). Within the traditional fiscal policy shocks the decrease in direct taxation would have the highest fiscal multiplier, followed by an increase of subsidies and indirect taxation with the lowest multiplier. Indirect tax reliefs only react a little bit lagged to the shock, due to price effects. In ‘t Veld (2013) estimated a fiscal multiplier for Germany (after an increase of government investment by 1% of GDP) of 0.8 to 0.9 in the first two years of the shock. This would translate into the other euro area countries with a fiscal multiplier of around 0.2 to 0.3 in the short-run.

Figure 16: Fiscal multiplier of alternative fiscal policies



R&D = public expenditure on R&D; TD = direct taxation; SUB = subsidies; TIND = indirect taxation.
Source: Own calculations based on the results of the Austrian macro growth model

5. Conclusions

Europe, the EU und in particular the euro area is embarking into a period of slow growth. Whether this already earns the name “secular stagnation” is an open question. It resembles in some aspects the development in Japan. A possible “Japanisation” of Europe (near-stagnation and deflation) in the decade to come cannot be excluded. However, due to self-imposed fiscal breaks the explosive public debt development of Japan will probably never happen in Europe.

Austria, which was privileged before the crisis by the positive effects of EU integration (“EU growth bonus”), now falls back to normality or to an economic equilibrium with lower growth

rates and must seek a growth strategy of its own. Out of the "three arrows" of economic policy, Austria as a member of the euro area cannot gear monetary policy which is done by the ECB. So there remain fiscal policy and structural reforms. Due to the unsustainable initial conditions on the fiscal side (too high budget deficits and too high public debt levels in the light of the new EU fiscal rules) a considerable fiscal expansion is excluded at present. Remain the strategy of structural reforms.

Simulations show that – although Austria belongs to the group of countries which are already advanced concerning the efficiency in the product and labour market – there is still room for manoeuvre to increase market competition and to lower market regulation concerning "doing business" in Austria. And a further increase in R&D investment is of course always welcome to stimulate growth. In addition to pure structural reforms and R&D investment there are two promising growth strategies for a small open economy: *First,* Austria can further participate in a possible deepening and/or enlargement of the European Union (although a further EU enlargement is politically excluded for the next five years) and benefit from a hopefully successful TTIP. *Secondly,* Austria could stimulate growth by reorienting its export markets from only the presently slow growing EU-28 to the faster growing newly industrial countries (BRICS etc.). Finally, on should be aware that the macroeconomic results of the simulated policy options presented here depend on the chosen model parameters and on the size of the policy impulse.

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