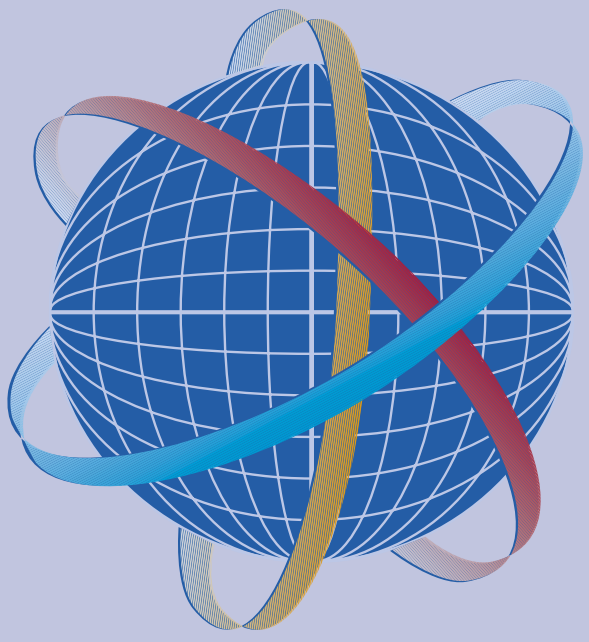
OESTERREICHISCHE NATIONALBANK
EUROSYSTEM

43rd ECONOMICS CONFERENCE 2015

Long-term perspectives for economic growth



As from 2016, the proceedings of the OeNB Economics Conference will be available online only at **www.oenb.at**.

To get updated on latest releases, please register at **https://www.oenb.at/en/Services/Newsletter.html**.

Contents

Session 5
Demography, labor markets, investment and growth

Session 6
The threat of secular stagnation and how to avoid it

Ewald Nowotny
Governor
Oesterreichische Nationalbank

Opening Remarks

Ladies and gentlemen,
I am very pleased to welcome you to the 43rd Economics Conference of the Oesterreichische Nationalbank here in Vienna.

This year we are going to discuss the "Long-Term Perspectives for Economic Growth" – and I would like to invite all of you to take part in this important discussion. We have once again prepared a *highly interesting program* featuring distinguished speakers and discussants from different backgrounds in academia and policy-making. My particular welcome goes to State Secretary *Sonja Steßl*, who will address this year's conference as our first speaker. Thank you very much for joining us today. At this point, let me also take the opportunity to thank the OeNB staff in charge of organizing this event for their outstanding efforts and commitment.

I would like to start my introductory remarks today with a quote that very well captures the recent economic policy debate:

> *"We are suffering just now from a bad attack of economic pessimism. It is common to hear people say that the epoch of enormous economic progress […] is over; that the rapid improvement in the standard of life is now going to slow down. […]; that a decline in prosperity is more likely than an improvement in the decade which lies ahead of us."*

These lines are not taken from a recent editorial or contemporary blog post. They are the *beginning of a famous essay by John Maynard Keynes* on "The Economic Possibilities for our Grandchildren," written in 1930. It is quite telling that 85 years later, we – the grand- and great-grandchildren of Keynes' generation – seem to find ourselves in a situation similar to his. The ruptures of a great economic crisis have again prompted sometimes gloomy forecasts of our future growth prospects. At this year's Economics Conference, we will

discuss in more detail whether these pessimistic outlooks are justified – or whether "this interpretation is widely mistaken," as Keynes concluded almost a century ago.[1]

Economic growth is a spectacular phenomenon. While an annual real growth rate of 2% might at first sight seem modest and inconsequential, it generates tremendous energy if it reoccurs year after year. A look at historic

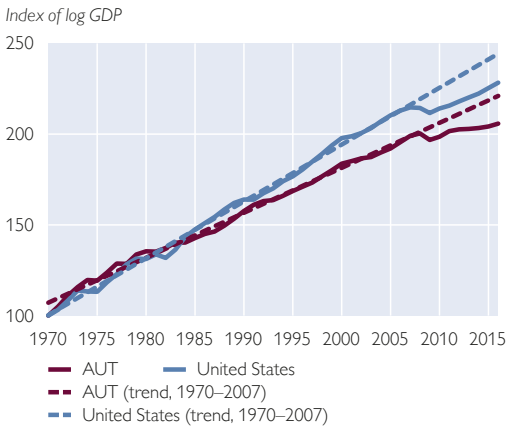
[1] *The entire quote is: "We are suffering just now from a bad attack of economic pessimism. It is common to hear people say that the epoch of enormous economic progress which characterised the nineteenth century is over; that the rapid improvement in the standard of life is now going to slow down – at any rate in Great Britain; that a decline in prosperity is more likely than an improvement in the decade which lies ahead of us. I believe that this is a wildly mistaken interpretation of what is happening to us. We are suffering, not from the rheumatics of old age, but from the growing-pains of over-rapid changes, from the painfulness of readjustment between one economic period and another. The increase of technical efficiency has been taking place faster than we can deal with the problem of labour absorption; the improvement in the standard of life has been a little too quick; the banking and monetary system of the world has been preventing the rate of interest from falling as fast as equilibrium requires." (John Maynard Keynes, Economic Possibilities for our Grandchildren, 1930).*

data reveals that *national per capita income*[2] in Western European countries has grown *by a factor of almost 15 since the onset of the industrial revolution*. This continuous growth in the last two centuries has fundamentally changed the economic environment: the range and quality of consumption goods, the means and possibilities of production, the available types of technology and the ways how people communicate, interact and conduct their lives.

For now, I would like to somewhat confine our view and look at no more than the past 45 years. In the chart you can see the real growth rates for Austria and (by comparison) for the United States for the period from 1970 to today. This chart contains three interesting messages. First, up to 2007 growth rates followed a *clear trend* in both countries: 2.7% in Austria and 3.1% in the U.S.A. Second, there are *considerable fluctuations* around these trend growth rates; the standard deviation in both countries is around 2%.

Chart 1

Real GDP development (1970–2016)



Source: OECD.

Third, it is extremely *difficult to disentangle* the two elements – *trend growth* and *fluctuations around the trend* – in real time. This is particularly relevant for the period after the onset of the Great Recession in 2007, when the strongest deviation from the trend path occurred.

There are two ways to interpret the developments following the Great Recession. The first one is to consider them a dramatic example of severe and persistent *underperformance*. Returning to the old trend path would require closing an output gap of almost 15% of GDP. This would still be possible within a number of years if growth rates were distinctly above the trend.

Unfortunately, our most recent forecasts do not indicate that such a catching-up process is already in the making, but rather suggest a slow recovery.

This gives some support to the second possible reading of the above chart. Under this interpretation, it would be overly optimistic to simply extrapolate the past growth trend into the future. On the contrary, we should consider the possibility that the Great Recession has marked the beginning of a *new era of lower trend growth rates*.

These are, in a nutshell, the two views that characterize the topic of this year's Economics Conference: the view that we are dealing with a persistent negative output gap and the view that we are confronted with a lower long-term growth rate.

The conference program includes sessions that are related to both perspectives and I am sure that we will be presented with evidence and arguments

[2] *This is based on the data provided in Angus Maddison. 2001. The World Economy. A Millennial Perspective, OECD, tables 1–2 and 1–3. The level of GDP per capita (measured in 1990 international dollars) increased from 1,232 to 17,921 (i.e. by a factor of 14.5) for Western European countries, while the figures for total GDP are even more impressive: an increase from 164 billion (measured in 1990 international dollars) to 6,961 billion (i.e. by a factor of 42.5).*

for both sides. In the following, I would like to briefly talk about some aspects that I consider particularly relevant and important. I will first focus on the long-term perspective, then comment on some demand-side aspects before concluding with remarks on policy implications.

Long-run economic development is influenced by many factors, ranging from technology, demography, political and social institutions to more recent phenomena like globalization and climate change. Making predictions about the next 50 or 100 years is highly speculative, but interesting nonetheless. A look at the standard growth model is probably a good starting point for organizing thoughts along these lines. In the standard growth model, the determinants of long-run GDP growth are population growth on the one hand and productivity growth on the other hand.

Demographic developments are expected to have a considerable impact on the future macroeconomic outlook. Decreasing fertility rates will have a direct negative impact on the growth rate of total GDP as long as they are not counteracted by increasing rates of net migration. Population aging, on the other hand, might lead to higher savings and thus – ceteris paribus – to a downward pressure on real interest rates. This reaction is sometimes presented as a direct and necessary consequence of the rise in life expectancy. It is important, however, to emphasize that the strength of this channel will depend on the reaction of retirement behavior, i.e. on people's incentives, willingness and ability to work longer. While demographic developments can be forecast quite accurately for the next 20 to 30 years, the development of retirement age is much less certain, as it will depend on the design of public and private pension systems, on the economic environment and on the progress of medical science.

This brings me to the second main driver of long-term economic growth: the *development of productivity*. A number of observers have argued that the

technological frontier is no longer expanding at the previous speed, that the "low-hanging fruits" have already been picked and that the wider consequences of the computer/internet revolution are more modest than those of the introduction of equivalent general purpose technologies like the steam engine or electricity.

Opposed to this pessimistic view of the future of innovation there is, however, a second camp of thought that has a much rosier, almost enthusiastic view of the technological possibilities that lie ahead. The subtitle of a famous book captures this perspective in a compact form: "How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy".[3] This camp of technological optimists refers to scientific breakthroughs that one might expect (or rather: not even expect) over the next decades, especially in the realm of life sciences. These discussions are thrilling and

there are many aspects that deserve thorough and sometimes speculative thinking. The second conference day is almost exclusively dedicated to these long-term topics.

Long-term forces are not the only possible cause for the modest growth performance recorded over the past few years. The recent debate has provided many more potential explanations for the weak economic recovery, and these, too, will be discussed later today and tomorrow.

Of particular prominence is the *secular stagnation* hypothesis dating back to Harvard economist Alvin Hansen. He viewed the weak recovery in the aftermath of the Great Depression as being caused by excess savings and a real interest rate that could not fall sufficiently such as to equate supply and demand at full employment. Today's

proponents of Hansen's hypothesis, for example Harvard economist Larry Summers, consider this mechanism to be the main driving force behind a *secular deficiency in aggregate demand* in the aftermath of the Great Recession. According to this view, long-term factors can be considerably amplified by a number of specific characteristics of a post-crisis recovery process.

The first characteristic is the zero-lower-bound on nominal interest rates. If inflation expectations are well anchored at the same time, the real interest rate will be stuck at an excessive level. As a consequence, we will see low investment and high unemployment.

A second characteristic of the current recovery process is the phenomenon of *debt overhang*, including household, corporate and public debt. A number of observers have identified this debt overhang as also having an aggravating influence on the drag on growth. They consider painful and long-lasting deleveraging both in the private and the public sector as a necessary prerequisite for economic recovery.

Finally, there is also the view that weak recovery is at least in part due to the increased degree of *uncertainty* surrounding future economic developments. This uncertainty leads households to increase their precautionary savings and firms to postpone their investments, further enhancing excess savings and thus exacerbating the deficiency in aggregate demand.

Let me conclude by discussing the *policy implications* – in particular the implications for monetary policy – of the recent debate. What can and should central banks do to sustain long-run growth and support economic recovery?

Monetary policy plays a vital role in managing demand fluctuations, in stabilizing prices, output and unemployment. The recent episode has shown that this is also true at the zero lower bound. Quantitative easing policies have contributed significantly to economic

[3] *This refers to Erik Brynjolfsson and Andrew McAfee. 2011. Race Against The Machine: How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy.*

recovery in the United States, and there are first signs of success of these policies also in the European Union. The recent spring forecast of the European Commission predicts a cyclical upswing across basically all EU Member States, and it attributes this upswing partly to the stronger-than-expected effect of the ECB's quantitative easing policy.

On the other hand, monetary policy is less effective when it comes to improving a country's long-term growth potential. Structural policies, institutions, research and development play more important roles in this context. But this is not to say that monetary policy is irrelevant for long-term growth. In fact, economic performance requires a growth-friendly environment. Monetary policy contributes to such an environment by ensuring a reliable policy framework, a sound financial system, a well-functioning banking system, and macroprudential policies that prevent excessive price fluctuations.

Finally, I do dare to confront this meeting of economists with a rather philosophical question – a question, however, that has already been asked by J. M. Keynes and which is today being frequently repeated especially among young people: What about the connection between economic growth and human well-being? Is there not an increasing need to look not only at the quantity but also at the quality of economic growth? This is a very broad field indeed, but questions like these may point to some aspects that also central bankers may have to take into immediate consideration. At the recent, highly interesting ECB Forum on Central Banking in Sintra, there was a discussion on structural reforms – which, as you know, is a mantra in all ECB statements. One of the eminent economists attending the conference asked what may be the human costs of certain forms of structural reform. So e.g. what forms of increased flexibility in the labor markets are really welfare improving and what forms of increased insecurity, involuntary mobility, reduced chances for family life may have long-lasting negative welfare – and maybe also outright growth – effects? And I may add: Would such a perspective lead to different priorities for policies that are intended to reduce unemployment? What does this mean for our standard concepts of potential output and a natural rate of unemployment, which the ECB by the way sees at 10 %, compared to 5 % in the U.S.A.? You may know the famous remark by George Bernard Shaw: "Economists know everything about prices and nothing about values." I trust that this will not be the motto of our meeting!

This brings me to the end of my introductory remarks. To conclude, I look forward to having a day and a half with you to discuss these important issues of economic policy from a multitude of perspectives. I hope you will find our Economics Conference a useful and an insightful event.

Sonja Steßl

State Secretary
Federal Ministry of Finance

Opening Address

Dear Governor,
Ladies and Gentlemen,
It is my pleasure to welcome you to Vienna, also on behalf of Federal Chancellor Faymann, who sends his greetings. I think the topic of this year's conference is timely and highly relevant for economic policy – as always with OeNB conferences.

In my opening remarks I would like to address three issues: first, I want to explore why economic growth is essential for our societies and why providing an appropriate framework for growth is a priority of our economic policy. Second, I want to specify in a bit more detail which growth model I am referring to; the EU's *Europe 2020 strategy*[1] delivers useful guidance in this respect. And finally, I will briefly lay out how we as policy makers can contribute to these long-term perspectives for economic growth.

Let me start by explaining why I consider economic growth to be so important for our society. In economics, there is quite a broad consensus from Karl Marx to Milton Friedman – I assume that range covers everybody in the room – a consensus that capitalist economies depend on economic growth to provide full employment.

Economically speaking, unemployment is a waste of resources and therefore should be avoided. But politically and socially it is much more than that: People out of work have diminished chances to participate in our society. They face a higher risk of sickness. And very often, they lose their self-confidence. The negative impact of unemployment on the personal lives of those affected is well documented and it is an important motivation for politicians to prevent unemployment and to reduce it whenever it occurs.

Low or even negative growth rates that cause unemployment also have a negative impact on the political stability of a country: contrary to widespread belief, it is not the unemployed who tend to vote for radical or extremist parties. The unemployed tend to stop voting at all. Very often, they do not feel represented any longer by political parties. But people still in employment who fear that they might share the dismal fate of the unemployed in the near future have a tendency to seek shelter with irrational fringe parties. They lose their confidence that conventional policies can provide economic growth effectively.

Even in countries that have weathered the crisis relatively well like Aus-

tria, we see a surge in political parties that do not offer a reliable policy alternative, but mostly appeal to instincts. Only if our policies provide long-term perspectives for economic growth – perspectives in which our citizens can believe – they will regain their confidence. And confidence is important for growth, but also for the stability of the political system.

But what do we mean when we speak about economic growth? Usually

[1] *For further information, see http://ec.europa.eu/europe2020/index_en.htm.*

we refer to the growth rate of GDP when in fact we want to increase the economic well-being of our citizens.[2] But there are varieties of growth models. For example, over a certain period, the Irish grew their economy quite successfully by buying from each other houses at higher and higher prices with

money they had borrowed from Germany and France; but this was not sustainable. This is not what we want.

What we want is smart, sustainable and inclusive growth as it has been defined by the EU's *Europe 2020 strategy*:

- What we want is a more efficient use of our natural resources.
- What we want is growth based on knowledge and innovation.
- What we want is a full-employment economy delivering social cohesion.

These are the priorities of the *Europe 2020 strategy* and I think they are well chosen. They provide a long term perspective for economic growth and the EU also has the tools and instruments in place to implement this perspective. I will speak about this more in a minute, but first let me tell you why I think these priorities form one integral strategy.

I think in a democratic society, inclusiveness is a pre-condition for sustainable growth.[3] Unbalanced growth that increases only the incomes of a happy few and excludes a big share of the population cannot go on forever: those who are excluded will become more and more frustrated and probably vote for the irrational fringe parties that I mentioned earlier.

These parties do not necessarily engage in redistributive policies, but they most likely run economic policies that are unsustainable in one way or another. For example, they might inflate the balance sheet of a state-owned bank to fund their populist extravaganzas and sink their country in debt. This is not what we want.

In history, as well as in some countries still today, we can find economic elites who exclude the majority of their fellow citizens from political participation. Not only is this incompatible with the democratic foundation of the EU, it is also bad economic policy: in a rigid system that excludes a part of its citizens, these citizens have no incentive to engage in more productive activities.

On the other hand, it is obvious that we should not use up much more of our limited natural resources. But we do have a resource which we have not driven to its limit yet and that is the innovative capacity of our knowledge based economy. In this respect it is quite surprising that some countries (Austria is unfortunately among them) still think they can afford policies that exclude a share of their youth from ac-

[2] *The Commission on the Measurement of Economic Performance and Social Progress, co-chaired by Joseph Stiglitz, Amartya Sen and Jean-Paul Fitoussi published a seminal report in 2009 on alternative ways to measure economic and social progress.*

[3] *The importance of inclusive institutions that generate positive feedback loops for welfare and development has been highlighted in an impressive way by Daron Acemoglu and James Robinson in "Why Nations Fail" (2012).*

cess to better education. In our school system, the educational degrees of young people are more determined by their parents' degrees than in most other countries. This is not smart. This is not inclusive. This is not what we want. What we want and what we need is a more comprehensive approach to schooling that allows all the young minds to develop their maximum abilities, thereby increasing the innovative capacity of our economy. The Chancellor has been pushing for a reform of the educational system in Austria and I hope that we will succeed in making our schools more inclusive.

We know from economic research that early childhood education has very high returns especially for children with less educated family backgrounds.[4] If we invest in early childhood education now we will have a more inclusive society tomorrow and an economy with more people employed in better jobs. That is what we want.

So, now that we know what we want, how do we get there? We have a strategy that sets priorities for the whole EU, and we have the European Commission who translates these priorities into national targets. We have the European Semester which is kicked off each year by the European Commission's Annual Growth Survey. In the Annual Growth Survey for 2015,[5] the Commission focused on three pillars, namely investment, structural reforms and fiscal responsibility. These are all very important areas and they definitely contribute to boosting growth in Europe.

However, I miss the focus on inclusiveness. The process was streamlined and the European Commission focuses on a few priorities, I understand. But we have just gone through the most severe economic crisis in recent history, unemployment and social hardship has reached levels in some countries that have been unknown for generations – and not one single reference to social inclusion?

There is one reference in the Annual Growth Survey that says that *welfare systems should play their role to combat poverty and foster social inclusion* (p. 15). But at the same time EU Member States are kindly asked to decrease their deficits and debts and it goes without saying that those at risk of poverty do not have a strong lobby when it comes to defending their benefits; especially not, if the cuts in social policies are justified by fiscal responsibility.

Now let me explore in more detail, how I understand fiscal responsibility and how it could help to improve the long term perspectives for economic growth. A more active fiscal policy could increase demand in a time when the private sector in most countries is trying to reduce its debt overhang. I see that in the afternoon you will have a session on this topic, which I consider to be of great importance. Now if everybody wants to reduce his or her debt at the same time, we know well that the paradox of thrift can occur and while savings go up, income goes down and in the end the debt-to-income ratio may be stable or even increase. This is not what we want.

Here we are faced with a coordination problem as the individual actions of households and firms are rational in themselves, but the collective outcome

[4] *On the positive effects of quality early childhood interventions targeted toward disadvantaged children, see Heckman, James; Pinto, Rodrigo and Peter Savelyev (2013) "Understanding the Mechanisms through Which an Influential Early Childhood Program Boosted Adult Outcomes," American Economic Review 103(6): 2052–2086.*

[5] *See http://ec.europa.eu/europe2020/pdf/2015/ags2015_en.pdf.*

is negative. In this case, the public sector can break a vicious cycle by using fiscal policy and restart growth again. It is interesting to note, that in the recent past the European Commission and the ECB have asked Member States with fiscal room for manoeuvre to invest more.[6] I could not agree more.

But unfortunately, those with fiscal room for manoeuvre are obsessed with reducing debt levels while paying negative interest rates on their debt. All they seem to have learned from the crisis is that unsustainable debts will cripple the economy.

The critical issue here is that nobody can say exactly which debt levels

are unsustainable. As we commemorate the 200th anniversary of the Congress of Vienna this year, just let me remind you that back then England had a public debt of 250% of GDP and it took about 30 years to halve that. Nevertheless, the high debt level did not prevent England from reaping the benefits of the industrial revolution.

So it seems we are faced with a coordination problem not only within the private sector, but also among governments. We often speak about policy coordination at the EU level, but basically it never means to account for the spillovers from policies in different countries; mostly it boils down to monitoring that each Member State individually follows the rules. This is not the ordinary understanding of the word coordination. As ECB President Draghi has noted last year in Jackson Hole: "Stronger coordination among the different national fiscal stances should in principle allow us to achieve a more growth-friendly overall fiscal stance for the euro area."[7]

Now some might ask, is a fiscal stimulus not only a short term thing and does it effect long term growth at all? I just want to caution against this separation of short term from long term effects, because we know that short term unemployment has a tendency to become persistent if the short term lasts a little longer.[8] As so often, it is better to be safe than sorry.

We have implemented a fiscal stimulus in Austria with our tax reform which is on the agenda of tomorrow's ministerial council. This reform is the biggest tax reform ever enacted in Austria; it will increase disposable income for almost all citizens: more than 6 million people subject to income tax will benefit from this reform. Our tax reform will provide a much needed boost to demand. Median wages have been stagnating for years, and private consumption has been weak.

[6] *The European Commission has been explicitly demanding in its Annual Growth Survey that Member States with fiscal room for manoeuvre need to invest more.*

[7] *www.ecb.europa.eu/press/key/date/2014/html/sp140822.en.html.*

[8] *This insight is not particularly new, as can be seen by Blanchard and Summers (1986): "Hysteresis and the European Unemployment Problem," NBER Macroeconomics Annual.*

Obviously, we cannot implement a tax reform every other year to strengthen net wages. What we need for the long term is strong growth of wages hand in hand with strong increases in productivity. And for broad based productivity growth we need an inclusive educational system that allows us to strengthen our innovative capacity.

As I am starting repeating myself, let me stop here and thank the Oesterreichische Nationalbank for hosting this conference. I think in bringing together international academics, policy makers, bankers and central bankers here in Vienna, you provide us with a good opportunity to listen to and learn from each other and so hopefully increase our productive capacity.

I wish you all two days of inspiring presentations and lively debates and maybe also some time to enjoy this lovely city of ours.

Session 1
Restarting growth: perspectives for the euro area

Andreas Ittner
Vice Governor
Oesterreichische Nationalbank

Opening Remarks

Ladies and Gentlemen,
I welcome you all to the first session on *Restarting Growth: Perspectives for the Euro Area*. Let me, as a financial supervisor, take the opportunity to raise some issues which are of importance in this context for financial stability reasons.

A long-term perspective on economic growth has to consider that too much debt can be a drag on economic growth. Already in the early 2000s, some economists stressed that financial deepening is only positive for economic growth up to a certain threshold – dependent on the time-horizon, the countries' institutional and economic development (e. g. Loayza and Rancière, 2006; Wachtel, 2003). This raises the question of "how much debt is right". For example, the IMF analysed a global sample of countries from 1970 to 2010 with a wide range of estimation techniques and came up with an easy rule of thumb: a threshold of about 80% of credit to the private sector as a share of GDP creates a maximum value-added for GDP growth (Arcand et al., 2012). Another example is Cechetti and Kharroubi (2015). They show for a panel of 15 OECD countries that an exogenous increase in finance reduces total factor productivity growth as financial sector growth disproportionately benefits high collateral/low productivity projects.

At the beginning of the crisis in autumn 2008, bank loans to the private sector stood at about 115% of GDP in the euro area (total banking assets were at about 343% of GDP in 2008/10). They were thus well above the mentioned threshold calibrated by the IMF – although these figures only include bank lending and not even securities outstanding. No wonder that a deleveraging process within the banking and private sector was observed during the last years and the issues of indebtedness of sovereigns, the financial sector and the private sector were pushed in the global spotlight. It has raised a major concern with many stakeholders: less financing – no growth.

But, one can also perceive these developments from a different angle. Deleveraging, defined as a reduction in leverage (capital/total assets), also means that banks and corporates have boosted their capital ratios. But more needs to be done, because the market and creditors ask for it (as highly levered institutions are granted no credit – or only at very high cost) and regulatory requirements are tightened for banks.

Often it is claimed that this process of deleveraging in the financial sector causes a reduction in the supply of credit to the real economy. However, this is contradicted by empirical evidence in Europe, where banks increased their capital significantly since

the peak of the financial crisis (plus 40% from October 2008 to end of 2014). Loans, instead, were not reduced nearly in that dimension. In the euro area, loans to the real economy (households and nonfinancial corporations) were only reduced by 2% from October 2008 to end of 2014. But most of this reduction is due to write-offs, reclassifications and exchange rate adjustments. The balance sheet reduction was instead mainly caused by a reduc-

tion in interbank loans (–22%) and external assets (–19%). In some countries even an increase in credit to the private sector is observed (e. g. in Austria).

Besides this often raised importance of the "quantity of credit", the "quality of credit" is crucial for individual institutions – from a microeconomic perspective – and also for the stability of the financial system as a whole – from a macroprudential perspective. Hence, credit growth at interest rates that do not cover the costs of capital and liquidity is neither desirable from a macroprudential nor an economic perspective. Adequate risk pricing in credit business is necessary to avoid unsustainable levels of indebtedness as mispricing of credit risk has long-term negative consequences in terms of high crisis cost. Underpricing of credit risk in the run-up to the recent economic and financial crisis contributed to global over-indebtedness and weighs on credit cost in the post-crisis period, which is referred to as the so-called "back-book effect".

In particular, in the current environment of ultra-low interest rates, the issue of adequate pricing is critical. Ultra-low interest rates are a double-edged sword: Monetary policy aims at fostering economic growth, while financial stability is set at risk. One major risk is embedded in rising "search for yield" as it manifests an increase in risk tolerance in a variety of different products across sectors. A global survey of supervisors, firms in the banking securities and insurance sectors found that this is the case e.g. for auto loans, increasingly risky assets in the investment portfolio for life insurers and the syndicated leveraged loan market (Joint Forum, 2015). In such an environment, capital adequacy is important to further strengthen the resilience of the banking sector against systemic risks. As the crisis has shown, higher capital buffers simply pay off in uncertain times.

Overall, debt is indispensable, but long-term economic prosperity will largely depend on "credit quality" rather than its mere quantity.

References

Arcand, J., E. Berkes and U. Panizza. 2012. Too much finance? IMF Working Paper 12/161.

Cecchetti, S. and E. Kharroubi. 2015. Why does financial sector growth crowd out real economic growth? BIS Working Paper 490.

Joint Forum. 2015. Developments in credit risk management across sectors: current practices and recommendations. June. www.iosco.org/library/pubdocs/pdf/IOSCOPD487.pdf (retrieved on 29 June).

Loayza, N. and R. Rancière. 2006. Financial development, financial fragility, and growth. In: Journal of Money, Credit and Banking 38 No. 4. 1051–1076.

Wachtel, P. 2003. Economic Review. Federal Reserve Bank of Atlanta. 33–47.


June 15 and 16, 2015
LONG-TERM PERSPECTIVE
FOR ECONOMIC GROWT

André Sapir
Professor Université Libre de Bruxelles and
Senior Fellow Bruegel

Reviving growth in the euro area: Demand management or structural reform policy?

The European Union (EU) – and the euro area in particular – has been suffering from low growth and high unemployment for several years. In its 2014 Autumn Economic Forecast, the European Commission was clearly downbeat, stating: "The EU economy is struggling to shake off its lethargy. Since the crisis struck, most Member States have been unable to generate or sustain strong economic momentum… [The result has been] slow growth in the EU and quasi-stagnation in the [euro area]." (European Commission, 2014). Six months later and after a series of positive developments including low oil prices and a low euro exchange rate, the Commission sounded a more optimistic, but still rather cautious message: "The near-term outlook for the EU economy has clearly improved…But will the economy be able to generate a self-sustained and balanced expansion once temporary tailwinds fade?" (European Commission, 2015).

The purpose of this paper is to provide some guidance on how to revive growth in the euro area. It starts by trying to understand why the euro area has stagnated for the past seven years and finds that explanations that only rest on structural rigidities or on insufficient demand are both wanting and that instead demand and supply policies need to be implemented to revive growth. The paper then takes a longer view at the European growth problem and finds that Europe, and the euro area in particular, faces a daunting challenge not having implemented a growth strategy before the crisis. Today, such strategy is needed even more than before, yet the headwinds are also more severe than before.

1 The euro area growth puzzle

There is little doubt that the euro area has fared extremely poorly since the advent of the financial crisis in 2008. Chart 1 shows that GDP, which dropped first in 2009 and a second time in 2013, is only expected to return to its pre-crisis level in 2015, seven long years after the start of the crisis. The two stages of the crisis in the euro area are

even better illustrated by chart 2, which shows that the unemployment rate for the euro area first jumped from less than 8% to around 10% in 2009, 11% and then to 12% in 2013.

The euro area's protracted, double-dip recession has been somewhat of a puzzle to the economics profession, which has split in two camps well characterized by my compatriot Paul De Grauwe. The first camp claims "that this low growth performance of the Eurozone is due to structural rigidities. In other words, the low growth of the Eurozone is a *supply side problem*. Make the supply more flexible (e.g. lower minimum wages, less unemployment benefits, easier firing of workers) and growth will accelerate." (De Grauwe, 2014; emphasis added). The second

camp advances a different "explanation for the Eurozone growth puzzle. This is that *demand management* in the Eurozone has been dramatically wrong since the start of the sovereign debt crisis. The latter led the Eurozone policymakers to impose severe austerity on the peripheral Eurozone countries and budgetary restrictions on all the others." (De Grauwe, 2014; emphasis added).

Those like Paul De Grauwe or Paul Krugman who belong to the second camp partly rest their case on something like chart 3, which contrasts the recent evolution of GDP in the euro area and in the United States. Their claim is that the euro area was well on track to recovery like the United States until it changed course in 2011-12 and adopted restrictive budgetary policies to deal with its sovereign debt crisis whereas the United States continued to pursue a relatively accommodating fiscal policy.

On the other side, those like many German economists who emphasise the role of structural rigidities tend to put forward something like chart 4, which contrasts the recent evolution of GDP in Germany and in Italy. Their claim is that these two euro area countries suffered a similar setback in 2009, but that Germany recovered rapidly thanks to its structural strength owing to pre-crisis reforms whereas Italy was unable to recover because of structural rigidities and lack of reforms.

My own view is that it is a mistake to oppose the structural and demand explanations and that instead the euro area's stagnation problem should be understood as the result of both supply and demand factors. To see this, I turn to chart 5 which displays again the evolution of GDP in the euro area and in the United States, but this time starting in 1999 when the euro was introduced rather than in 2007 when the financial crisis began.

What chart 5 shows is that the evolution of GDP in the euro area and in the United States was different already prior to the crisis. Applying the different pre-crisis trends to the euro area and the United States starting at the trough point (2009), the dashed lines in chart 5 show the evolution of GDP that would have occurred had the recovery in the euro area and in the United States followed their respective pre-crisis trends. For the United States, the gap between the dashed and the plain lines was never very large after 2009 and basically closed by 2015, implying that it had a one-time drop in GDP in 2009 but successfully recovered thereafter. By contrast for the euro area, the gap between the dashed and the plain lines becomes very wide starting in 2013, implying that although it had temporarily recovered from the initial drop in 2009 the euro area has not yet recovered from the second GDP drop associated with the sovereign debt crisis in 2011-12.

This back-of-the-envelope calculation implies that the large gap between the GDPs of the euro area and the United States observed since 2013 can be attributed to two factors of roughly equivalent weight: structural rigidities in the euro area compared to the United States that explain the differential growth performance that prevailed already before the crisis; and inadequate crisis management by the euro area, especially as far as the sovereign debt crisis is concerned. Note that I use the expression "crisis management" rather than "demand management" because I consider that the inadequate policy response to the euro area sovereign debt crisis was not just a matter of demand management but also of the poor handling of bank problems due to

the absence of a banking union, which resulted in excessive forbearance.[1]

This assessment, which combines rather than contrasts demand and supply factors, is apparently shared by Mario Draghi, President of the ECB, who concluded his 2014 Jackson Hole speech on unemployment in the euro area by stating that "a coherent strategy to reduce unemployment has to involve both demand and supply policies." (Draghi, 2014).

2 Beyond revival: dealing with Europe's long term growth problem

The euro area's growth problem discussed in the previous section cannot be easily dissociated from Europe's longer-term growth problem that was already detected well over a decade ago.

The 2003 Sapir Report (Sapir et al., 2003 and 2004) found that the EU's performance had been unsatisfactory since the early 1970s, with a steady decline of both GDP and productivity growth resulting in per capita GDP stagnating at about 70% of the US level. Chart 6 shows a similar trend for the euro area.

The Sapir Report ascribed Europe's disappointing growth performance to its inability to adapt an antiquated economic and social model to two major changes, the information technology revolution and globalisation, which called for new organisational forms of production with less vertically integrated firms, greater mobility within and across firms, greater flexibility of labour markets, greater reliance on market finance and higher investment in both R&D and higher education. The Sapir Report considered it urgent that the EU economic system be reconfigured so as to deliver higher growth. Failure to do this, it warned, would gravely endanger the sustainability of the European model with its emphasis on cohesion.

The Report argued that the key to meet these challenges was to deliver on the commitments of the 2000 Lisbon Agenda, the strategic economic goal of the European Union to become by 2010 a competitive and dynamic knowledge-based economy with sustainable economic growth, more and better jobs and greater social cohesion.

In order to achieve this goal the Report proposed a six-point agenda focusing on reforms where it considered that EU policies had the biggest potential to improve EU growth. The six main recommendations were to (1) make the

single market more dynamic; (2) boost investment in knowledge; (3) improve the macroeconomic policy framework of Economic and Monetary Union; (4) redesign EU policies for convergence; (5) improve EU governance methods; and (6) restructure the EU budget. Although some of these recommendations were implemented, the Sapir Report failed to change the main thrust of the European policy agenda and to convince policymakers that they needed to do more than pay lip service to the ne-

[1] *ESRB (2012) provides an early analysis of and warning about the dangers of forbearance in the euro area.*

cessity of a European growth strategy. See Sapir (2014).

As chart 6 indicates, the introduction of the euro did not prove to be a game changer in terms of growth. In fact, the euro area's per capita GDP in 2015 was at the same level compared to the USA as it had been in 1999, slightly below the average trend for the period 1970–2015. At the same time, however, dispersion among euro area countries greatly increased between 1999

and 2015 – first decreasing before the crisis and then sharply increasing since 2011. Germany, Austria and Ireland have improved their relative position compared to the USA between 1999 and 2015. On the other, Greece and Italy have seen their relative position deteriorate. In the middle, Belgium, Finland, France, the Netherlands, Portugal and Spain have kept their relative position vis-à-vis the USA more or less unchanged. The situation is particularly striking as far as France, Germany and Italy, the three largest euro area countries, are concerned. In 1999, their per capita GDP levels (measured at purchasing power parities) were almost identical. By 2015, the level in Germany was 15% higher than in France and 28% higher than in Italy.

More than ten years after the publication of the Sapir Report, Europe is still struggling to adjust its economy to major tectonic changes – globalisation, technological change and ageing. Unfortunately, the financial and sovereign debt crisis has compounded the challenges by accelerating the previous trends, creating new problems and decreasing the room of manoeuvre of governments to tackle them, partly as a result of the accumulation of public debts due to the crisis.

The previous discussion suggests that the time has come for European leaders to switch from a mode of crisis response to one of strategic action and to propose a new growth agenda.

The growth agenda proposed by the Sapir Report mainly emphasized supply measures because at the time Europe's main problem was indeed structural. Yet it also argued that the monetary and fiscal policy framework of EMU should be made more symmetric over the phases of the cycle.

Today's growth agenda ought to provide a convincing response to Europe's immediate and longer-term challenges, which entails both closing the output gap and increasing potential output. The strategy needs therefore to be two-handed: demand measures to close the output gap and supply measures to increase potential output.

On the supply side, the priority must be to implement the EU growth strategy, Europe 2020, the successor of the Lisbon strategy, with an emphasis on three areas. The first is the completion of the single market and the implementation of complementary structural reforms by the Member States to foster competition in product markets. Second, national labour market and social policies (including formal education, training and life-long learning) need to be modernised in the direction of greater flexibility and security for workers along the lines of the success-

ful Nordic model.[2] The EU could help facilitating national reforms with a proper use of the EU budget. Third, the EU budget can also help to increase Europe's research effort and to build a genuine European Research Area (ERA). Significant progress in these three areas would help Europe becoming a knowledge-based innovation society and economy able to confidently respond to the challenges of the 21st century.

On the demand side, the overall policy mix of the euro area needs to be more conducive to reducing the existing output gap. The key here is greater symmetry in the conduct of macroeconomic policy. Restrictive fiscal policy in crisis countries must be accompanied by looser policy in countries that enjoy fiscal space; it would also be useful if the EU could play a role in fiscal stabilisation. As far monetary policy is concerned, the ECB was late in launching its quantitative easing (QE) programme and in communicating that it is committed to a symmetric attitude towards both inflation and deflation risks. It did so in January 2015 and must keep the course until its objective of an inflation rate of below but close to 2% in the medium term is in sight. It must also communicate better that its inflation objective applies to the euro area on average rather than each and every euro area country, and therefore that achieving both disinflation in the euro area's periphery countries and the 2% objective implies an inflation rate of probably close to 3% in core euro area countries. Symmetry in the conduct of fiscal and monetary policies would result in a symmetric adjustment within the euro area that would contrast with the current asymmetric adjustment supported mainly by the crisis countries.

3 Conclusion

Europe – and the euro area in particular – is going through a testing period. In addition to having to respond to a number of long-term challenges that were already underway a decade ago, it has to deal with the consequences of a severe crisis which has left behind high levels of debt and unemployment in many Member States.

Tackling these issues requires a European growth strategy. Had Europe implemented the Lisbon strategy launched in 2000 and the related proposals made, for instance, by the Sapir Report, it would not probably have avoided the financial crisis but at least it would have been in much better shape to rebound more strongly and quicker.

Today, Europe must put forward a new growth strategy that not only incorporates the supply-side ideas of the Lisbon strategy and its successor Europe 2020 but also recognizes that insufficient demand is currently a constraint on growth in many of its Member States. As I wrote in a letter to the president of the European Commission more than ten years ago: "Growth must become Europe's number one economic priority – not only in the declarations of its leaders but first and foremost in their actions." (Sapir et al., 2003).

[2] *Sapir (2006).*

References

De Grauwe, P. 2014. Stop structural reforms, start public investments. Ivory Tower Blog. 16 September.

Draghi, M. 2014. Unemployment in the euro area. Speech at the annual central bank symposium in Jackson Hole. 22 August.

European Commission. 2014. European Economic Forecast – Autumn 2014. In: European Economy 7/2014.

European Commission. 2015. European Economic Forecast – Spring 2015. In: European Economy 2/2015.

European Systemic Risk Board. 2012. Forbearance, resolution and deposit insurance. Reports of the Advisory Scientific Committee No. 1.

Sapir, A. 2006. Globalization and the Reform of European Social Models. In: Journal of Common Market Studies Volume 44 No 2. 369–390.

Sapir, A. 2014. Still the Right Agenda for Europe: the Sapir Report Ten Years On. In: Journal of Common Market Studies Volume 52 Supplement S1. 57–73.

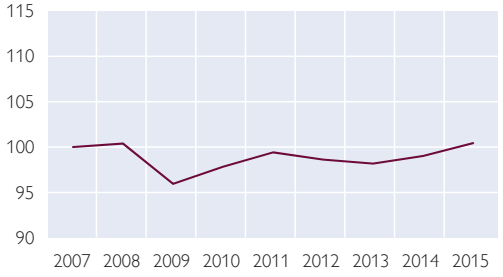
Sapir, A., P. Aghion, G. Bertola, M. Hellwig, J. Pisani-Ferry, D. Rosati, J. Viñals and H. Wallace. 2003. An Agenda for a Growing Europe: Making the EU Economic System Deliver. Report of an Independent High-Level Study Group established on the initiative of the President of the European Commission. Brussels: European Commission.

Sapir, A., P. Aghion, G. Bertola, M. Hellwig, J. Pisani-Ferry, D. Rosati, J. Viñals, H. Wallace with M. Buti, M. Nava and P. M. Smith. 2004. An Agenda for a Growing Europe: The Sapir Report. Oxford: Oxford University Press.

Chart 1

Real GDP for the euro area 2007 to 2015

Index 2007=100

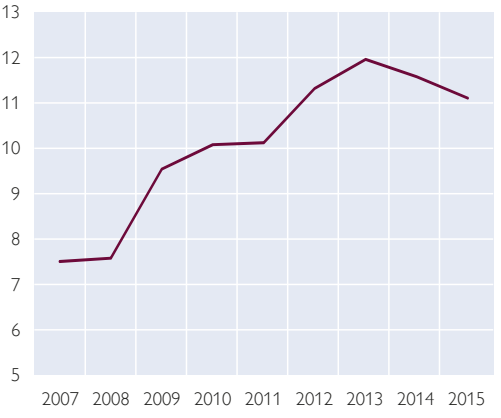


Source: IMF WEO (April 2015).

Chart 2

Unemployment rate for the euro area from 2007 to 2015

% of labour force

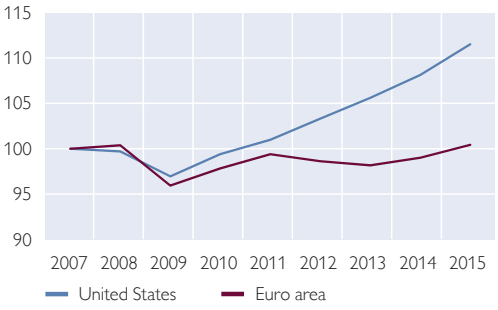


Source: IMF WEO (April 2015).

Chart 3

Real GDP for the euro area and the United States from 2007 to 2015

Index 2007=100

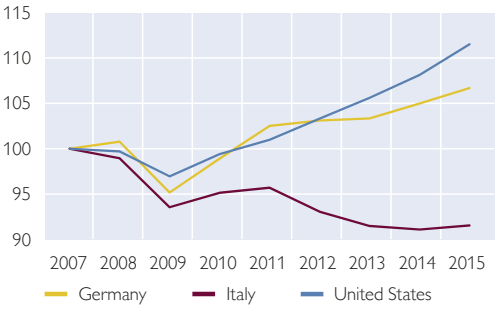


Source: IMF WEO (April 2015).

Chart 4

Real GDP for Germany, Italy and the United States from 2007 to 2015

Index 2007=100

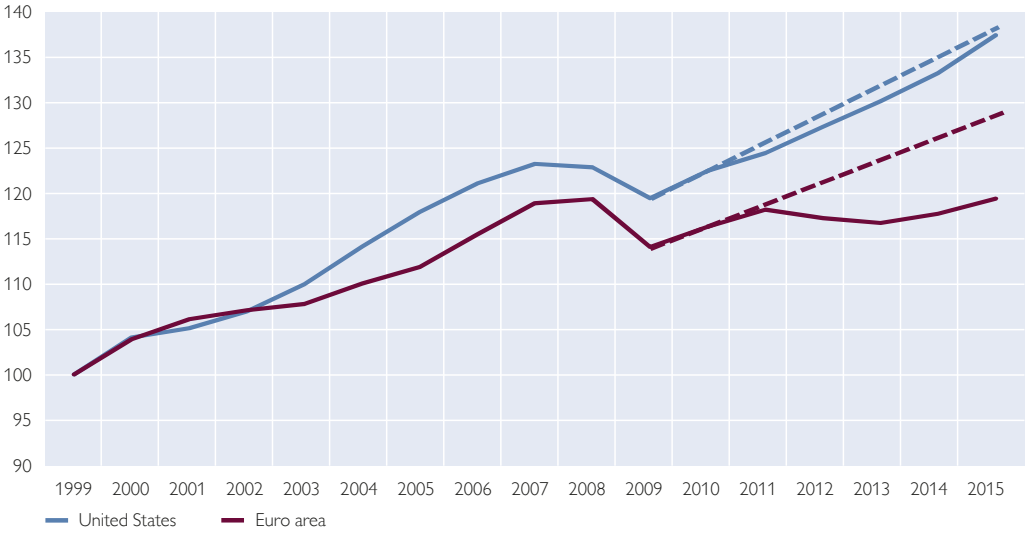


Source: IMF WEO (April 2015).

Chart 5

Real GDP for the euro area and the United States from 1999 to 2015

Index 1999=100

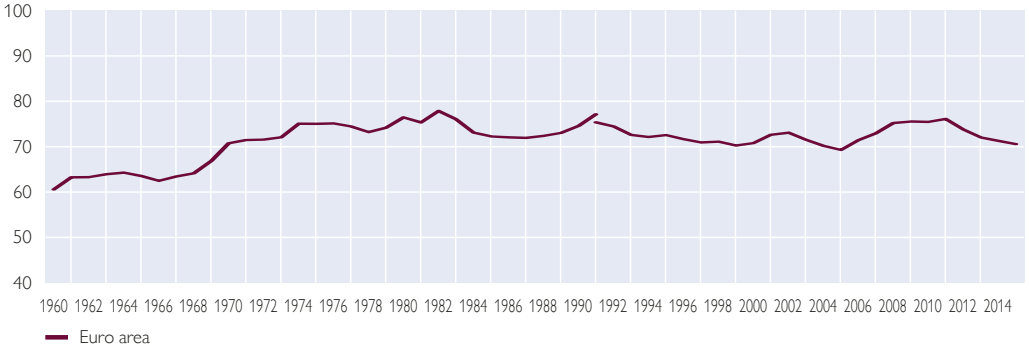


Source: IMF WEO (April 2015).

Chart 6

GDP per capita at purchasing power parities for the euro area from 1960 to 2015

Index USA=100



Source: AMECO (April 2015).

Note: The break in the data in 1991 is due to German reunification.

Karl Aiginger
Director
Austrian Institute of Economic Research

A two stage strategy for restarting growth[1]

Ten hypotheses (focussing on Europe) plus an appendix on two stages for industrialized countries

1 Europe is a success model in the midlife crisis

Success can be demonstrated by the number of Member States of the European Union (and those with the intention to join or to cooperate more closely in the future) or by Europe's size in world trade (larger and more stable than that of the US) and its trade surplus. The euro has become a widely accepted currency, its future is no longer questioned despite of predictions of many US economists from the beginning that it will never work. The value of the euro (relative to the US dollar) is as high as at the start (it had been too strong for several years) but this did not lead to current account deficits of the EU. Europe has achieved the pacification of a formerly belligerent continent (within the current borders of EU-28). But also many countries outside have reformed institutions and reluctantly started a dialogue with neighbours with whom conflicts had a high probability before.

Indicators for a critical phase of the European development today are the low dynamics (GDP is practically not higher than 2008), the youth unemployment rate of 20%, inadequate European governance (with national priorities and preferences still overriding community goals), decreasing political support, and inroads of left wing as well as right wing parties often cooperating with each other, both looking for alternatives to the European project.

Europe has not yet the institutions to influence political conflicts, be it in North Africa or in the Black Sea area, it cannot provide information about border crossing military troops and not deliver humanitarian relief efficiently as shown in the Ukraine conflict. This ineffectiveness holds despite of expenditures for the 28 military systems larger than that of Russia and China combined.

Europe is reluctant to build on its own strengths and to stick to set targets, and last, but not least to close the gap in innovation and entrepreneurship for the majority of countries and shift resources from the past to the future in general.

2 A large and inefficient public sector, and lack of will

The public sector is quantitatively large and surprisingly inefficient. Close to 50% of GDP is absorbed on average (of the Member States) by three to four layers of government (from local to European) without eliminating differences in gender, parental position and income on education or the distribution

[1] *This paper was presented at the INET Conference 2015 (in April 2015) and then adopted for the NERO Meeting in Paris 2015, and finally presented at the 43rd OeNB Economics Conference in Vienna 2015. It is focusing on restarting growth in Europe. The two stage strategy for industrialized countries in general is based on an approach discussed in the project WWWforEurope (http://www.foreurope.eu/).*

of life chances. The expenditures for R&D are low in most countries and below national as well as EU targets. The direction of the technical progress is unfavourable (it is labour saving instead of resource saving). This tendency is shared with other countries (USA, Japan) but it did not change since the EU roadmap had defined the goal of reducing emissions to 10% or 20% of its current level up to 2050 and as youth unemployment had doubled. Quality of education is mediocre in many parts of Europe (even in large countries like Germany, France, Italy and Spain), support for entrepreneurship, mobility, social innovation, enhancing life chances is inadequate.

Lack of finance is less important than lack of political will. On the national as well as on the European level it is often argued that there is a lack of finance.

This is not really the case, first since finance offered to investors with a joint European guarantee is cheap; it is not true even for current fiscal balances.

- Europe currently spends on subsidies for fossil energy probably more than for renewables. Specifically in times of a low oil price, the subsidies for coal and oil could be curbed without social costs.
- Europe spends more on 28 military systems (inadequate for any challenge outside Europe) than Russia and China together (with very high expenditures particularly in high deficit countries like France and Greece).
- Europe spends the largest single part of the EU budget for subsidising big agricultural units (specifically on that pillar which does not prioritize to bio agriculture).
- Europe allows tax evasion for firms and forfeits an adequate tax on financial speculation.

Taking these four sources of money together depending on time horizon and ambition 100 to 200 billion funds per year can become available. They can be used for reducing distorting taxes, on reducing budget deficits or for increased spending on future competitiveness.

3 Taxing the wrong activities and "forgetting" the own targets

The tax system makes positive activities expensive like employment and the creation of jobs. European countries are unable or unwilling to tax public bads like emissions, resource uses, fossil energy, tobacco, polluting traffic. The ability to tax wealth and inherited income is very low due to insufficient transparency of capital flows, profit shifting, and tax exceptions favouring mobile capital. If banks are regulated it is easy to switch money to non banks or to off shores. Tax evasion and tax fraud seems to be an accepted activity of successful firms, managers, innovators in a system with big government, bureaucracy and over taxation (a tendency which is currently changing slightly). Labour is taxed, financial speculation not (if anything a stamp duty on new shares looks to be realistic ten years after the start of the Financial Crisis, which would be a new burden on the real economy).

The discussion about austerity is attracting too much attention; the real

problem of Europe is overspending for past priorities and for particular interests, implying a shortage of funds for investing into the future, into new firms and jobs. A corollary of this is the inability to stick to strategic goals, whether this is the EU 2020 strategy or the energy roadmap 2050. The EU 2020 midterm review (Aiginger, 2014c) has shown that employment goals, R&D targets and poverty goals were widely missed and environmental goals which had been set without ambition (e.g. in relation to the energy roadmap 2050) had been attained only due to stagnant respectively declining GDP. And nobody cared about missing the strategy goals. If many European countries still face high fiscal deficits or if debt has even increased relative to GDP, this is more the consequence of low growth, wrong taxation and three to four layers of inefficient bureaucracies, than of radical public austerity.

4 Lack of private demand and asymmetric application of structural reforms

The quest for so called "structural reforms" is adequate in principle, but the term has been hijacked by a specific conservative agenda. Structural reforms which activate labour supply, which remove particular interests or entry barriers for new firms are fine, but in practice the call for structural reforms is always used to exert downward pressure on labour costs, specifically in the segment of already low wages. The discrepancies between high and low incomes thus increased since the financial crisis, the wages which are already lagging productivity are further dampened. Wage increases are criticized in the European semester, wages below the productivity increase are overlooked. These tendencies additionally reduce consumption in a time in which firms were reluctant to invest their profits and business had become a net saver. It is well known that the benefits of structural reforms on the labour market occur in the long run and will materialize in good times (like the benefits of German's Hartz 4, ten years after creating a low wage sector on Germany labelled as „dead man of Europe"). Asymmetric calls for structural reforms (forgetting those leading to high incomes and super normal profits in regulated businesses) reduce aggregate demand and employment in bad times.

The question which component of aggregate demand should rise after the Financial Crisis was constantly ignored; austerity as defined by low public deficits is the minor part of demand inefficiency (and difficult to tackle if good times did not deliver budget surpluses and government share approaches already 50% of GDP). If consumption decreases due to low wage increases (and decreasing real wage after tax and inflation), and if large firms do not use their profits for investment but become net creditors, and small and young firms are credit squeezed since the financial sectors wants to reduce risk, private demand will not rise. Firms and investors will become pessimistic about future growth. Investment incentives, reducing product market incentives, and producing incentives for business starts and innovation including those in renewable energy and energy efficiency by higher standards could help.

Therefore, Europe faces „private austerity" in the sense of lacking potential or willingness to increase private consumption and private investment. To match it by increasing export (surpluses) is limited for extra-European exports (increasing intra-European exports is infeasible as a national strategy for all members). To compensate lack

of private demand by the traditional strategy of increasing public deficits and size of the public sector is the wrong way, since the government sector is already large and its extension would furthermore boost inefficiencies, leading to higher taxes and lower investment and consumption (without radical structural policies, very different ones than those known from the past).

5 Only "high road" competitiveness is feasible for Europe

Europe's chance is to go intentionally for a „high road to competitiveness" (Aiginger, Bärenthaler-Sieber and Vogel, 2013). A low road approach, consisting of depressing wages, reducing other costs including social and environmental standards and opening a second labour market is not feasible for a high wage region, surrounded by neighbours with low wages, abundant work force and own efforts to catch up with richer countries via an export led strategy. The only feasible way for Europe is a "high road strategy" based on quality, structural change, education, innovation and social and ecological ambitions.

Aiginger et al. (2013) define five „capabilities" as drivers of success: education, innovation, institutions, activating social policy, and ecological ambition. Outcome or performance of an economy is measured not by the export surplus but by the attainment of a set of economic, social and ecological goals. This radically changes the content of the term „competitiveness" from price (or cost) competitiveness to the "ability of a region to provide Beyond GDP goals". This redefinition may look of academic interest first, but in fact a well defined concept of high road competitiveness is a game changer from an inadequate past looking strategy to a future oriented one. A compliment of this game changing definition is to define a new systemic industrial policy as a policy supporting high road competitiveness (for definitions for a new industrial policy see Aghion, Boulanger and Cohen, 2011; Rodrik, 2013; Aiginger, 2015).

Going for a "high road" holds with a slightly different perspective and specific reform needs for Southern and Eastern Europe. Of course countries with large deficits in current accounts have to bring costs down. But the real problem is "costs per unit of output" and these can be corrected by productivity increase, technology transfer, fostering new firms at least as easily as by a cumulative downward strategy of lowering labour costs.

It was essentially the problem leading to the crisis that Southern European countries remained in a competitive position adequate for the pre-globalisation area. Southern Europe should have climbed up the quality ladder to a medium income position, defendable if new low cost competitors came up. High energy costs (of Europe relative to the USA) can be compensated by increasing energy efficiency (with existing differences of 3:1 across industrialised countries) and renewables substituting coal, oil and gas imports can help to balance current accounts.

6 A bravo – with a proviso – for the European Fund for Strategic Investment (EFSI)

In the current European situation with a deficit in aggregate demand not easy to be solved by higher private consumption or higher private investment and budgets that need to be consolidated a European investment fund attracting international capital is an excellent idea. There are however different problems to be addressed. The most impor-

tant proviso is that the projects in which the money should be invested should be carefully selected. The list of projects submitted by member countries up to now is the sum of those projects which were rightly rejected due to lack of specific demand in the past or insufficient future prospects (or both). Highways that did not get priority in the Trans European Nets (TEN), atomic energy plants which could not work profitable without subsidy, airports too near to other airports were resubmitted.

The core of the projects finally approved by the New Fund should be where (i) the long-run growth effects are largest and (ii) the short-run demand effects on employment are high too. These criteria imply a shift from the old paradigm of material investment to the new one that economic growth in rich countries depends more on intangible investments and Europe has a specific deficit in intangibles (innovation, high quality education, ICT).

A second problem of the Strategic Investment Fund is that project selection, financing and project implementation will need that much time that the economic impact of the fund will become relevant for demand in late 2016 (and for supply about 2020).

7 A bottom up complement is needed: a "silver bullet strategy"

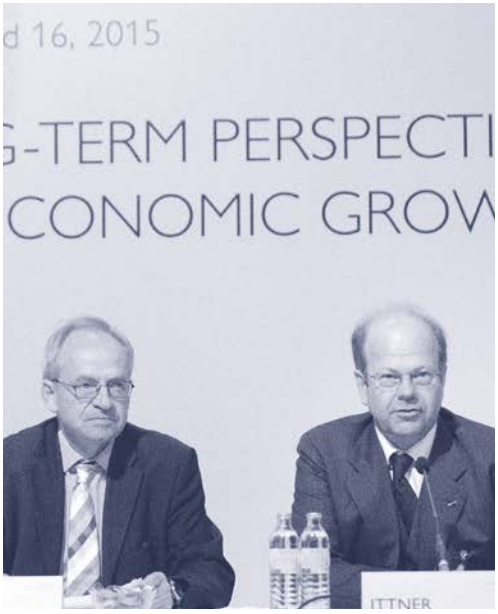
A necessary complement for the Strategic Investment Fund is therefore exemptions from the fiscal pact along a "silver bullet strategy". Countries should be encouraged to spend more than allowed by the fiscal pact if they invest in 5 to 10 pre-determined expenditure categories. Aiginger (2014a) proposes for example the following categories: research and education, early childhood investment, requalification, infrastructure maintenance and upgrading, refurbishment of homes and offices, improvements of energy efficiency closing bottlenecks in energy and broadband grids, renewable energies, business parks, incubation centres. Preconditions for this extra spending (relative to the Fiscal Pact limits) are that these are additional investments and they are complemented by symmetric structural reforms (symmetric respective to the distributional effects). Independent

agencies should monitor the content and the adherence to the criteria to the European parliament. This proposal (Aiginger, 2014b) is more restrictive than golden rule proposals which would qualify all investments – specifically highways and other material investment of old style Keynesianism for permanent deficit spending; it is compatible with the rules of the fiscal pact – and the exceptions should be possible for a maximum period of 3 years. This is better than to postpone targets indefinitely and not dependent on clear criteria and eternal monitoring as it is done today.

8 It has to be a "Europe including the neighbours" or a shrinking Europe

Some economists advocate a small "Core Europe". A "Core Europe" consisting of Germany, France and some other countries would currently supply

10% of world output and this share will decrease to 5% or 6% up to 2050. Core Europe would be a low growth area with annual growth between 1% or 1½%. A Europe including neighbours (in Western Asia and Northern Africa)



2050 would still produce about 30% of world output, and growth will be at least as dynamic as in the USA. A regionally defined Europe plus neighbours needs not include only EU Member States and by far not all neighbours can become euro area members. Wider Europe should be a region in which economic, political and cultural relations are closer than those with more distant regions and continents.

But it is not the economic issue alone which is relevant: If Europe does not cooperate with its eastern neighbours (Black Sea, former Soviet Union), with Arab countries and North Africa, these countries will look for new partners. Populist parties be it from the right or the left, from Greece to Serbia, and Hungary and France openly show sympathy for autocratic systems (and are happy to cooperate with each other). The European neighbourhood including some countries in the current EU will be destabilized economically and politically by conflicts in the European neighbourhood. The current wave of refuges is a visible consequence of economic and political dastabilisation. It results from a missing of proactive neighbourhood policy and may threaten the European integration process.

9 Towards a coherent strategy based on a long-run vision

This is a decisive phase for the European project in six dimensions: (i) economically; if Europe will not take part

Box 1

A primer for a strategy change for Europe

- *Business as usual is no longer feasible for Europe*
- *Unemployment and stagnation threaten EU-project and peace*
- *Globalisation offers chances; needs complementary policy*
- *Restarting growth needs as first stage of a Two Stage Strategy: consolidation and reprogramming*
- *The second stage is transition to a regime, where lower growth provides higher welfare*
- *Radical, absolute decoupling (energy, material) urgent but a demanding task*
- *Decoupling employment from output is needed if growth decelerates*
- *Distribution (opportunities, income, wealth) lies at the core of a strategy change*
- *Reforms need a vision, ambition, institutions, allowing for heterogeneity*
- *Reform resistance to be tackled by communication, democratic discourse*
- *EU should no longer ignore neighbours: culture, schools, ERP-initiative*
- *Neither USA's nor China's strategy is based on "Beyond GDP goals"*
- *Europe can become a role model: dynamics, inclusion, sustainability*

in this upcoming business cycle a lost decade will be completed, (ii) for coping with internal disequilibria: Southern Europe including France and Italy need a stronger productive base and new industries for exports; (iii) social acceptance; youth unemployment, and income spread have to be reduced, (iv) peace in the neighbourhood: from Ukraine to North Africa, political destabilization and economic problems enforce each other, (v) technologically; Europe has to close the technological lead of the USS, from ICT to biotechnology; (vi) Europe has the last chance to extend its first mover advantage in renewables, energy efficiency, new car engines and other industries needed to limit climate warming to 2 degrees.

If Europe solves these problems isolated, there will be not enough money to tackle them (given the unwillingness to make all the changes in the public budgets delineated above). And there is no chance to agree on measures across Europe. If problems are addressed by a strategy which starts from a vision and develops synergies, different goals can be attained simultaneously.

Such a strategy is currently developed in the project "A new growth path for Europe" by 33 European research institutions under the lead of the Austrian Institute of Economic Research (WIFO; see www.foreurope.eu). Its constituent strategy lines are:

- Stronger dynamics based on innovation and skills, measured by Beyond GDP goals
- Less differences in incomes, higher employment
- Europe becomes world leader in environmental technology and renewables
- Stable financial sector, regulated, financial transaction tax, reduced taxes on labour
- Open area, enjoying globalisation/ heterogeneity, inviting neighbours

This vision starts from goals, not from problems. The consolidation of budgets and lower debt are a long-run necessary side condition. The goal however is a balanced economic dynamic, with increasing consumption and investment, but also with respect for the limits of the planet and the equalisation of life chances across regions and persons.

Taxing financial transactions and public bads, zero tolerance tax evasion, much lower taxes on labour are integral parts of the strategy, acknowledging that income distribution matters for growth and stability. Equality of opportunities and life chances, capabilities, institutions, dialogue and democratic discourse, the tolerance for heterogeneity and transforming it into a productive force is part of the strategy. A deep absolute decoupling of energy consumption on resource use is necessary (this implies –80% to –90% CO2, doubling energy efficiency, 50% share of renewable redirecting technical progress from labour saving, to energy and resource saving).

10 Europe will overcome its midlife crisis if it improves its own model

Europe will overcome its midlife crisis if the public sector is streamlined, reoriented towards the future, if taxes and incentives are used to support employment and growth. And if Europe invests into its own model of a social cohesive and ecological sustainable economy instead of mimicking the USA or the Asian model; Europe needs leading and learning from its neighbours as to achieve a decisive role in the globalized economy of 2050.

Going for ecological excellence and reducing youth unemployment as well as the spread of income and wealth are

not blockers of dynamics but are if embedded in a strategy drivers of change, innovation and dynamics. This holds specifically for Europe, since these societal goals fit to the European model better than to alternatives. The goal of becoming world leader in renewable technologies is part of the program of the New Commission. The current low oil prices should be used for a substantial reduction of subsidies for fossil energy and for rebuilding emission trading. The pending trade agreements inter alia between Europe and the US (TTIP) and the upcoming climate conferences should be used to coordinate the efforts to limit global emissions, to build up a new cleaner industry (industry 4.0), to tax kerosene (while reducing taxes on labour), to develop an industrial policy favouring societal goals.

The technology policy should improve resource and energy productivity (not that much labour productivity as done today[2]). Europe currently builds the new infrastructure for 2050 and develops traffic systems and car engines for 2050. The infrastructure built today decides about feasibility and costs to reduce emission to 10% of the current level in Europe as planned in the Energy Roadmap 2050.

Annex: Towards a two stage strategy for industrialized countries

Europe as well as other industrialized countries will experience lower growth in the very long run. This will happen for several reasons.

Lower growth for high-income countries in the very long run is not necessarily a problem since marginal utility of incomes decreases and costs of congestions and agglomeration increase. Tripling output up to 2100 (as implied even by a modest growth rate of 1.5%) will probably not be compatible with the bio capacity of the planet. The goal of decarbonisation[3] is difficult even for given output, the more for an output three times as large as today. Last but not least history shows that phases of high growth rates (more than 1% per year) are the exception.

Stage 1: Consolidation and reprogramming

But in the short and medium run our economies are not prepared for slow growth. Current unemployment is about 10% in Europe (with youth unemployment near 20%). In the USA unemployment is lower, but the employment rate has dropped significantly. Technical progress is labour saving, so that growth below 2% tends to raise unemployment. Government (and private) debt is high and needs to be repaid by growth. Poverty is not yet erased and income differences and inheritance of life chances is still large (and these

[2] *"Biasing" technological progress towards increasing resource and energy productivity faster than labour productivity should be easy given the strong government inference in innovation policy and high taxes in Europe in specific.*

[3] *Decarbonisation has been set as long run goal (1) by OECD ("zero net emissions for the second half of the century, Gurria 2013, (2) by the G-7 summit in June 2015 and (3) the EU Energy Roadmap 2050 (–80% to –95 %).*

problems can more easily be tackled in growing economies). Therefore, for the next ten or twenty years industrialized countries need to restart growth in the direction of 2% or more (we call this 1st Stage; Consolidation and Reprogramming).

Stage 2: Socio-ecological transition

Long-term forecasts for industrialized countries are predicting lower growth than in the past, maybe between 1% and 2%. The predicted growth rates furthermore decrease with the forecast horizon.[4] This may come from saturation of demand (declining marginal utility of incomes), out of technological pessimism, lack of new generic technologies or due to ageing). Lower growth is welcomed by that part of literature which stresses the bio-physical boundaries of the planet, and which are pessimistic about decoupling of emissions from output.

For this longer run the first priority is to get higher welfare (employment, health, capabilities) out of probably lower growth rates. The spread between high and low incomes has to decrease, people preferring leisure will be able to work fewer hours, welfare payments will change from transfers to social investment, and higher energy efficiency and new energy sources will allow to reduce emissions radically. We call this second stage Socio-ecological Transition. It is characterized by double decoupling (emissions from output and employment from output growth).

Reprogramming is all important

Even if industrialized countries have to go for growth over the next ten to twenty years, the first stage cannot be business as usual but has to be investment in change (reprogramming). This implies to build a new infrastructure (less dependent on fossil energy), to develop social innovations (e.g. sharing instead of buying), changing institutions and behaviour. For economic policy the dominance of GDP has to be replaced by addressing welfare goals (as represented by Beyond GDP indicators) directly. It is important to target (and „bias“) technical progress from labour saving to resource and material saving, to change tax systems and public procurement. Country reports by OECD, EU-Commission should stress the “reprogramming task” even in annual analyses and recommendations.

References

Aiginger, K. 2015a. Making ambitious green goals compatible with economic dynamics by a strategic approach. WWWforEurope.

Aiginger, K. 2015b. Industrial Policy for a Sustainable Growth Path. In: Bailey, D., K. Cowling, P. Tomlinson: New Perspectives on Industrial Policy, Oxford, Oxford University Press. 2. April 2015. 365–394.

Aiginger, K. 2014a. Dynamics, Inclusion, Sustainability: A research based vision for the socio-ecological future of Europe. WWWforEurope. Midterm project information.

Aiginger, K. 2014b. A silver bullet for restarting growth in Europe. EurActiv18. December 2014. www.euractiv.com/sections/euro-finance/silver-bullet-restarting-growth-europe-310912.

Aiginger, K. 2014c. The europe 2020 strategy at midterm: Disappointing assessment calls for an urgent change driven by long run priorities. WWWforEurope. Policy Paper 17. October.

[4] *OECD Forecast for 2060.*

Aiginger, K., K. Bayer, K. Kratena, K., M. Schratzenstaller, G. Tichy and T. Weiss. 2014. Towards a vision for Europe in 2050. WIFO. Mimeo. April.

Aiginger, K., S. Bärenthaler-Sieber and J. Vogel. 2013. Competitiveness under New Perspectives. WWWforEurope. Working Paper 44. October. www.foreurope.eu/fileadmin/documents/pdf/Workingpapers/WWWforEurope_WPS_no044_MS46.pdf

Bayer, K. 2015. Transition conflict How to Decide When Transition Conflicts Arise. WWWforEurope.

Braconier, H., G. Nicoletti and B. Westmore. 2014. Policy Challenges for the Next 50 Years. OECD. July. www.oecd.org/economy/Policy-challenges-for-the-next-fifty-years.pdf.

Derviş K. and F. Saraceno. 2014. An Investment New Deal for Europe, Brookings. www.brookings.edu/blogs/up-front/posts/2014/09/03-european-central-bank-dervis.

European Commission. 2014. An Investment Plan for Europe COM(2014) 903 final. Brussels. http://ilcampodelleidee.it/allegati/an--investment--plan--for--europe_com_2014_903_en.pdf

European Commission. 2011. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A Roadmap for moving to a competitive low carbon economy in 2050. /* COM/2011/0112 final */.

G7. 2015. Summit. Leader's Declaration. 7 to 8 June.

Gurria, A. 2013. The climate challenge: Achieving zero emissions. Lecture by the OECD Secretary-General Mr. Angel Gurría. OECD. London. 9 October.

IEA. 2015. World Energy Outlook Special Report 2015: Energy and Climate Change, 15 June.

Johansson, A. and E. Olaberría. 2014. Global Trade and Specialisation Patterns Over the Next 50 Years. OECD. 2 July. www.oecd.org/economy/Trade-and-specialisation-patterns-for-the-next-fifty-years.pdf.

Juncker, J.-C. 2014. Investing in Europe. Strasbourg. 2014. http://europa.eu/newsroom/rapid-failover/speech-14-2160_en.pdf.

OECD. 2014. Shifting Gear: Policy, Challenges for the next 50 Years. Economics Department Policy Notes No. 24. July.

OECD. 2013. Renewable Energy: a Route to Decarbonisation in Peril? 29th Round Table on Sustainable Development. Paris. 4–5 June.

Rodrik, D. 2013. Green Industrial Policy. Mimeo.

Tichy, G. 2015. Protecting Social inclusion and mobility in a low growth scenario. WWWforEurope.

Vogel, J. 2015. The Bias of Technological Change in Europe. WWWforEurope. Working Paper. Mimeo.

Session 2
Long-run growth, monetary policy and the financing of the economy

Peter Praet
Member of the Executive Board
ECB

Structural reforms and long-run growth in the euro area

As the ECB's accommodative monetary policy is playing its part in the euro area recovery, structural reforms are the domain where there is more still to do to create the conditions for sustainable long-run growth, which is critical to the integrity of our monetary union. There is however no "one size fits all" model for how countries should go about tackling structural challenges. While there are principles that apply across countries, each economy is different and reforms have to be tailored to national conditions. As a central bank, our interest is not in how countries implement reforms, but whether they succeed in doing so.

There are two main channels through which structural reforms can support long-run growth in the euro area, namely through increasing the adjustment capacity of the economy and through raising its potential growth rate. Put differently, reforms can raise both the trend of long-run growth and reduce the fluctuations around that trend. Both aspects are particularly important in a monetary union, which makes structural reforms commensurately more pressing. The environment for introducing structural reforms is better today than for several years: all the conditions are in place for governments in the euro area, individually and collectively, to begin addressing their long-term challenges.

Ladies and gentlemen,
Thank you very much for inviting me to participate in this panel on "Long-run growth, monetary policy and financing of the economy".

For some this may seem like an unusual combination of topics, as it is often argued that monetary policy has no long-run effects. Monetary policy can however affect long-run growth in several ways. First, by increasing certainty over the future price level it can support investment and efficient resource allocation. Second, by reducing fluctuations in the business cycle it can help forestall hysteresis effects. Third, if one takes a "leaning against the wind" view of monetary policy, it can play a role in tempering the financial cycle and misallocation of resources that often comes with it.

But monetary policy is already playing its part in the euro area, so I do not want to dwell on this topic today. I will focus instead on an area where there is more still to do to create the conditions for sustainable long-run growth – that is, structural reforms in the euro area.

The main point, I would like to make is as follows. For many euro area countries structural reforms are central to higher long-run growth. And that each economy achieves this is in turn critical to an efficient implementation of monetary policy and, over time, to the integrity of monetary union. But there is no "one size fits all" model for how countries should go about tackling structural challenges. While there are principles that apply across countries, each economy is different and reforms have to be tailored to national conditions.

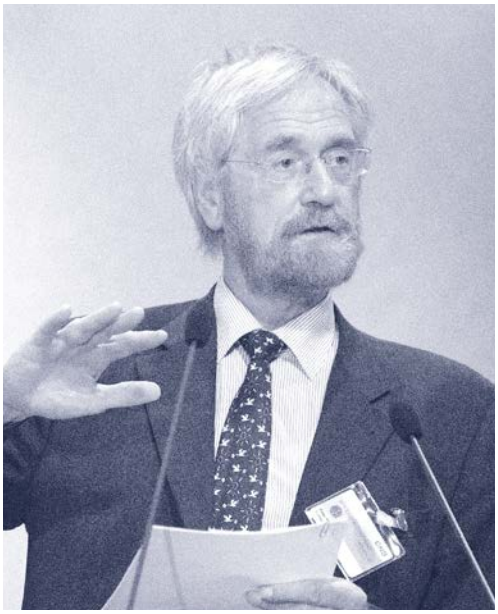
As a central banker, my interest is therefore not in *how* countries go about strengthening their economies. This is for governments individually and collectively to decide who know their national challenges best. My interest is in *whether* they succeed in doing so, due to the impact this has on price stability and on the cohesion of the union as a whole.

In the remainder of my remarks, I will elaborate on these points, focusing on the two main channels through which structural reforms can support long-run growth in the euro area.

1 Increasing adjustment capacity

The first is through increasing the *adjustment capacity* of the economy. This

means two things: first, that output is less affected by shocks because relative prices adjust quickly; and second, that the recovery in output is faster because the economy is able to reallocate resources in a more efficient way. Adjustment capacity is important in itself, but it also supports long-term growth insofar as it reduces the depth of recessions and the duration of unemployment, lessening labour and capital hysteresis.



When countries do not have an independent monetary policy and exchange rate, as in the euro area, the ability to adjust to shocks in this way becomes commensurately more important. To avoid large increases in unemployment it is crucial that national institutions can facilitate a smooth adjustment process. In other words, the need for a higher degree of "resilience" comes automatically with membership of a monetary union.

While this is first and foremost a national responsibility, it is also of common interest in a monetary union. If some members consistently rebound more slowly from shocks than others, it complicates the achievement of price stability at the euro area level. The risk also increases that differences in structural unemployment become entrenched across the union. And insofar as this weakens the political rationale for monetary union – that all members are better off over time inside the union than they would be outside – it also weakens its long-term cohesion. That has negative spillovers for all member economies.

It is in this context that several of my colleagues on the ECB Executive Board have recently called for stronger common governance at the European level over economic policies.[1] The ability of all countries to adjust well to shocks is not only key for the delivery of our mandate, it is vital for the integrity of the currency. This is an area of legitimate interest for the central bank which is the guardian of that currency.

However, it is important to stress that the ECB's interest in structural reforms should not be misinterpreted as a call for centralisation along a "one size fits all" model. We do not need all euro area countries to adopt identical structural reforms. What we need is a framework that takes into account both how countries *differ* based on their national conditions, and how they are *similar* by virtue of being in a monetary union. Within those parameters there are various combinations of country-specific institutions that can produce smooth adjustment.

Let me illustrate what I mean by focusing on one example: labour markets.

Theory suggests that – in a monetary union – there are certain principles that should apply to labour markets

[1] *For instance, see Draghi, M. 2015. Structural reforms, inflation, and monetary policy. Introductory speech at the ECB Forum on Central Banking. 22 May.*

across countries. For instance, without the option of exchange rate devaluation, maintaining wages in line with productivity over time is thought to be central to sustaining competitiveness and avoiding painful internal devaluations. Ensuring that wages can respond to changes in labour demand or supply is also seen as a key element in limiting the employment cost of shocks. If firms have the scope to cut costs on the intensive margin – i.e. wages, bonuses and working time – they are less likely to cut costs through the extensive margin, that is, labour shedding.

Wage-productivity links have indeed proven to be an important factor in countries' external positions. France, for example, has experienced large losses in export market shares since the start of monetary union in 1999, and part of the reason for this is that labour market institutions have allowed wages and productivity to delink across firms. Microlevel data show that wages have grown almost as much in the least productive French firms over the last decade as they have in the most productive. By contrast, in Germany there is clear wage dispersion according to firm productivity.

Moreover, while the strength of the crisis shock has inevitably led to high job destruction, the employment cost does appear to have been influenced by the margins of adjustment available to firms. On the whole, those that had scope to adjust on the intensive margin have cut jobs less. For example, new microlevel research from the Eurosystem finds that firms with flexibility at the plant-level have reduced employment less during the crisis than those bound by centralised wage bargaining agreements, partly because they have been more able to adjust wages and working time to economic conditions.[2]

Labour market policies that reflect such principles may therefore be beneficial in most euro area countries. But it does not follow from this that there is an optimal model for the labour market that all must emulate. Economies are complex, and how labour markets function depends on manifold interactions at the national level. Designing structural reforms thus requires a nuanced and country-specific approach.

For example, how the labour market adjusts to shocks depends not only on wage formation, but on the overall constellation of labour market institutions within national economies. That is, how the adjustment margins interact with other features such as unemployment insurance, employment protection and active labour market policies – the latter being particularly important in the current context of a "cleansing" recession requiring substantial reallocation and retraining of workers. And we know from international experience that different combinations of labour market institutions can produce similar employment outcomes.

If one compares, for example, the largest euro area economy, Germany, with the USA and Denmark, we can see that they have different levels of public expenditure on labour market protection (0.1% in the USA, 0.7% in Germany and 2.1% in Denmark), different levels of union density (US 11%, DE 19%, DK 69%) and a different percentage of employees covered by wage bargaining agreements (US 13%, DE 62%, DK 80%). Unemployment rates in all three countries have nonetheless been on a downward trend since 2009.

[2] *di Mauro, F. and M. Ronchi. 2015. Centralisation of wage bargaining and firms' adjustment to the great recession: A micro-based analysis. CompNet Policy Brief No. 8. May.*

Moreover, how labour market institutions affect adjustment also depends critically on interactions with other policy areas. In Greece, for example, it took around two years for lower labour costs to translate into lower prices, largely because product markets were highly protected and did not react. Due to structural factors the responsiveness of the economy to price changes has also been relatively low: Greece ranks below most other small economies in terms of both share of foreign trade to GDP and elasticity of exports to price competitiveness. Policy objectives like raising competitiveness therefore have to take a broad set of national conditions into account: competition in product markets, the quality of judicial systems and public administration, the ease of doing business, to name but a few.

There are of course other factors that are relevant as well, in particular the role of demand policies. But the key point is about *diversity*. It is not enough to give one-dimensional prescriptions such as that the all labour markets must become more flexible. What matters is that the combination of policies and institutions within each country produces an outcome that is satisfactory for its citizens and sustainable for the euro area as a whole.

Underscoring this message is important, otherwise it can wrongly seem as though monetary union deprives citizens of democratic choice. One could get the idea that which political orientation a country opts for is unimportant, as it will have to implement to same structural reforms anyway. There are some minimum requirements that come with being part of a monetary union. But there are various ways of meeting them. This is perhaps a notion that, in the future, we could do a better job of conveying.

2 Reinforcing supply capacity

Alongside adjustment capacity, structural reforms contribute to long-run growth through a second channel: by increasing the *supply capacity* of the economy, or its potential growth rate. Well-designed structural policies not only increase the quantity of inputs to the production process – i.e. higher labour supply and capital growth – but they can also foster the more efficient use of those inputs across and within sectors, that is, higher total factor productivity (TFP).

The supply capacity channel is also especially important in a monetary union. In the absence of large-scale fiscal transfers and with limited labour mobility across countries, all member economies need to be able to sustain high levels of growth and employment for the union to be cohesive over the long-term.

Potential growth is however weak in many euro area countries. This is in part because the crisis has lowered both capital growth, through a steep fall in investment, and labour supply, through higher structural unemployment. But it also reflects weak long-term trends in productivity. For example, between 2000-14 TFP increased cumulatively by only 1.5% in the euro area, while in the USA it rose by 10.9% in the same period. This not a situation over which we can be complacent, not least given the substantial damage that still remains from the crisis.

Structural reforms can play an important role, in different ways, in addressing the challenges related to each production factor.

Labour supply in the euro area will inevitably be affected by the impact of ageing societies. Yet with high structural unemployment there is clear scope to increase quantities, especially through labour market policies targeted

at reactivating the long-term unemployed. In Portugal, for example, ECB internal estimates find that active labour market policies can explain about one-third of the improvement in employment since the trough. The 2012 Spanish labour market reform is also estimated to have saved the destruction of about 60,000 jobs in the short term, and had a medium-term impact of some 300,000 fewer jobs destroyed.[3] These are admittedly relatively small gains relative to the scale of the challenge, but they provide an indication that determined actions in this area can produce results.

Though the investment-to-GDP ratio in the euro area is currently still 3.5 percentage points below its pre-crisis level, *capital growth* is projected to bounce back as the economy strengthens and accelerator effects take hold. However, there are two key risk factors to this outlook, both of which structural reforms can help mitigate.

The first is that pessimism among firms about future growth prospects continues to weaken the business case for higher investment. 5 years ahead growth expectations among forecasters have been falling continuously since 2001, from around 2.7% then to 1.4% today, which may have filtered through into "animal spirits". In this context, structural reforms that raise expectations over the path of potential growth can have an important psychological impact, insofar as they reduce uncertainty and dislodge negative sentiment.

The second risk factor is that the persistence of a debt overhang in parts of the euro area continues to act as a major drag on firm and household spending. Here structural reforms can be supportive both through their positive effect on GDP – the denominator effect – and through facilitating nominal debt reductions – the numerator effect. In the latter case, this comes down to issues such as improving the efficiency of insolvency regimes, out-of-court restructuring frameworks and judicial systems.[4]

However, we know that it is not just raising the *quantity* of investment that matters for long-term growth; the *quality* of investments, and how they contribute to *TFP growth*, is just as significant. Indeed, it is telling that since 2000 total investment has been slightly higher as a percentage of GDP in the euro area than in the USA, while producing a much inferior TFP performance. Two factors can help explain this discrepancy: first, the relatively higher share that US firms have invested ICT capital, and second, the efficiency with which they have turned that investment into productivity gains. And it is structural factors which, at least in part, account for these two differences.

First, while there is variance within the euro area, on the whole there is a

[3] *BBVA. 2013. Revista Situación España. 2013 Q2.*

[4] *For more on this point see speech by Peter Praet, Repairing the bank lending channel: the next steps, 17 November 2014.*

relatively higher proportion of micro and small firms in Europe than in the USA. European firms are also more static, in the sense that they do not grow or shrink over time. For example, the average size of a manufacturing sector start-up in the USA and Italy is roughly the same within its first two years – 5 to 10 employees. After ten years, however, the average US firm has grown to around 75 employees, while the average Italian still has below 15 employees.[5]

This matters because the size and growth rate of firms tends to have strong impact on ICT diffusion. Small firms are generally characterised by a relatively lower accumulation of ICT capital due to the higher fixed costs they face.[6] They also tend towards higher risk aversion and encounter greater difficulties in collecting resources to finance more innovative projects.[7] An economy populated by small firms that do not grow is therefore likely to be one with lower investment in ICT, and therefore lower TFP growth.

The reasons why euro area firms grow more slowly are complex, but structural policies certainly play a role. In Italy, for example, regulations that kick-in at the 15 employees threshold appear to have encouraged firms to stay small (although these are de facto now no longer in force).[8] A similar phenomenon has been observed in France, where size-contingent regulations appear to cause firms to cluster below 50 employees.[9]

Wider product and labour market regulations may also affect firm growth by hindering firm entry and exit and hence discouraging reallocation. For example, differences in product market protection are associated with differences in ICT adoption and diffusion in the service sector.[10] Recent evidence suggests that the quality of institutions can also affect reallocation: enhancing the efficiency of civil justice can lead to higher rates of firms' market entry and attract foreign direct investment.[11] In this sense, the incentives for within-firm innovation may be closely linked

[5] *Criscuolo et al. 2014.The dynamics of employment growth: new evidence from 18 countries. CEP Discussion Papers 1274. June.*

[6] *Pellegrino, B. and L. Zingales. 2014. Diagnosing the Italian disease. Unpublished manuscript. September.*

[7] *Amatori, F., M. Bugamelli and A. Colli. 2011. Italian Firms in History: Size, Technology and Entrepreneurship, Banca d'Italia Economic History Working Papers 13. October. See also Bugamelli, M., Cannari, L., Lotti, F. and S. Magri. 2012. Il Gap Innovativo del Sistema Produttivo Italiano: Radici e Possibili Rimedi, Banca d'Italia Occasional Papers 121. April.*

[8] *Schivardi, F. and R. Torrini, 2004. Firm size distribution and employment protection legislation in Italy. Banca d'Italia Economic Working Paper 504. June.*

[9] *Garicano L., C. LeLarge and J. Van Reenen. 2012. Firm size distortions and the productivity distribution: Evidence from France. NBER Working Papers 1884. March 2012.*

[10] *Dabla-Norris, S., V. Haksar, M. Kim, K. Kochhar, K. Wiseman and A. Zdzienicka. 2015. The New Normal: A Sector-Level Perspective on Productivity Trends in Advanced Economies. IMF Discussion Note.*

[11] *Lorenzani, D. and F. Lucidi. 2014. The Economic Impact of Civil Justice Reforms. EC Economic Papers 530.*

to the capacity for between-firm reallocation.[12]

However – and this brings me to the second point – even in euro area countries that have kept pace with the USA in terms of ICT capital, firms have been less able to exploit the productivity potential of their investments. For example, between 2001 and 2007 the average annual contribution of ICT capital to GDP growth was identical in the USA and Belgium (0.38 percentag points), yet TFP contributed 0.53 percentage points more to GDP growth in the USA. Structural and institutional factors can in part explain these differences, too.

One key element is differences in the quality of human capital. The impact of ICT on productivity is crucially mediated by the quality of management and its ability to implement the necessary organisational changes required by new technologies. While the USA ranks highly in terms of management quality, with some such as Germany close behind, most euro area countries are estimated to have average or below-average management practices.[13] This clearly weighs on productivity growth. Indeed, one study finds that management practices account for about one quarter of cross-country and within country TFP variations.[14]

Addressing this human capital gap above all requires structural policies linked to education and training. But it also has a broader dimension linked to ownership structures and meritocracy. For instance, rigid family ownership structures have been found to be associated with lower management quality, as they limit the talent pool from which firms can draw.[15] Such structures also tend to reinforce firm smallness.[16]

In sum, structural reforms that address the nexus between firm size, organisation and ICT are central to raising TFP growth in the euro area. But let me stress that what I am talking about is not an agenda to promote digital technology firms or build "Silicon Valleys", as important as that might be. What is most crucial for TFP growth is the diffusion of new technology into the ICT-*using* sector – namely services – where the euro area lags most behind the USA. As the largest part of the euro area economy, exploiting ICT in this sector is critical for the euro area to significantly boost its aggregate productivity.

Raising productivity is not a challenge that we can take lightly. It is not only central for a cohesive monetary union based on real economic convergence. It is also a necessary condition of supporting ageing societies. As the European Commission's new Ageing Report shows, the economic age dependency ratio – the ratio between the inactive elderly (65+) and total employment – is projected expected to rise from 44.6% in 2013 towards 66.4% in 2060.[17] Only with higher

[12] *Andrews, D. and C. Criscuolo. 2013. Knowledge-based capital, innovation, and resource allocation. OECD Economics Department Working Papers 1046. May.*

[13] *Bloom, N., R. Sadun and J. Van Reenen. 2012. Americans Do IT Better: US Multinationals and the Productivity Miracle. American Economic Review Volume 102 No. 1. February. See also Pellegrino, B. and L. Zingales. 2014. Diagnosing the Italian disease. Unpublished manuscript. September.*

[14] *Ibid.*

[15] *Bloom, N. and J. Van Reenen. 2007. Measuring and Explaining Management Practices Across Firms and Countries. The Quarterly Journal of Economics Volume 122 No. 4. November.*

[16] *Bugamelli, M., L. Cannari, F. Lotti and S. Magri. 2012. Il Gap Innovativo del Sistema Produttivo Italiano: Radici e Possibili Rimedi. Banca d'Italia Occasional Papers No. 121. April 2012.*

[17] *European Commission. 2015. The 2015 Ageing Report.*

productivity growth can so few sustainably support so many.

3 Conclusion

Let me conclude.

What I have argued today is that structural reforms can raise long-run growth in two ways: by raising the trend of long-term growth, and by reducing the fluctuations around that trend. Both these aspects are particularly important for economies in a monetary union. This makes structural reforms commensurately more pressing.

This is not to say that all the euro area's problems are structural. Demand policies remain crucial to close a still-large output gap and to secure a strong cyclical recovery. And it is possible that some issues that are currently considered to be structural, such as high long-term unemployment, could reverse in a stronger demand environment. That is to say, if hysteresis operates in the downswing, it may also reverse in the upswing.

Yet according to all estimates potential growth in the euro area is weak, and has been on a declining trend for at least 15 years. A strong and sustained recovery, therefore, cannot come from demand policies alone. It has to entail reforms that improve the allocative efficiency of the economy and unlock its supply capacity.

The environment for introducing structural reforms is better today than for several years. Monetary policy is extremely accommodative. Activity is recovering. And credit supply constraints are falling, allowing finance to flow quickly to the new investment opportunities that reforms create. All the conditions are therefore in place for governments in the euro area, individually and collectively, to begin addressing their long-run challenges.


ÖNB
ÖSTERREICHISCHE NATIONALBANK

Anne Bucher
Director DG ECFIN
European Commission

Investing in Europe

A sobering medium term outlook for the EU economy

Short term economic prospects for the EU have brightened over the last twelve months. The strengthening of recovery led the European Commission to revise upwards its growth projections for 2015 and 2016, with an expected growth rate of 1.8% for 2015 and 2.1% in 2016 for the EU as a whole.

The EU economy is benefiting from a number of favourable tailwinds: low energy prices, favourable liquidity conditions created by the ECB, improved export performance stemming from a lower exchange rate. Meanwhile, fiscal policy is broadly neutral and thus is no longer acting as a drag on the economy.

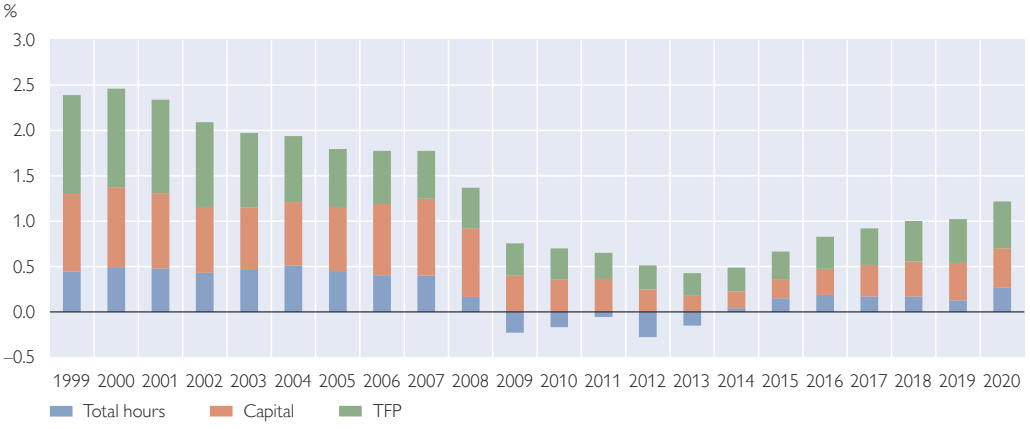
But the medium term outlook points to considerable challenges. With unchanged policies, the European Commission estimates that the potential output growth will remain well below pre-crisis levels and barely above 1% in 2020.

When decomposing the development of potential output until 2020 into the contributions of labour, capital and total factor productivity, the low growth performance is the outcome of a lack of dynamism in each of the three components: Due to ageing, the population of working age will increase more slowly and will start to decline at the EU level from 2022 onwards; capital accumulation has suffered from the drastic fall in investment ratios since the inception of the crisis and total factor productivity is on a downward trend. The decline in productivity growth is not a new development and reflects to a large extent a steady decline in total factor productivity since

the early 1990s. These already unfavourable trends have been compounded by the crisis itself. The crisis has markedly slowed down the pace of capital accumulation and has left many outside the labour market for a protracted pe-

Chart 1

Potential output growth decomposition euro area



Source: European Commission (2015).

riod of time. This reduced pace of physical and human capital accumulation will continue to weigh on the output trajectory. The low medium term growth prospects in the EU have a number of worrying ramifications. They imply in particular that the EU is falling further behind the USA, while other economies are rapidly catching up with the EU economy.

Policy response: the need for a renewed commitment to reform

The macroeconomic policy stance is broadly appropriate in the current juncture. The use of unconventional monetary tools has been important to mitigate the risk of a deflationary spiral. The current broadly neutral fiscal policy stance strikes the right balance between the objectives of fiscal sustainability and stabilisation in the phase a nascent recovery. However, while offering a welcome reprieve in the short run, monetary and fiscal policies are not sufficient to address the more structural challenges the EU economy is facing and to reverse the declining trend in total factor productivity (TFP) growth. This requires a renewed commitment to reform as well as a convincing investment drive.

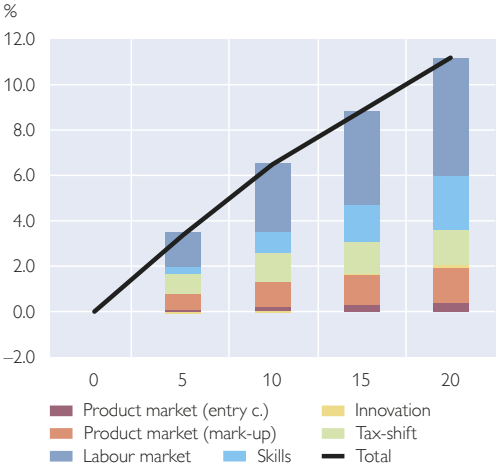
Structural reform progress has been mixed and somewhat uneven across countries and areas of necessary reforms. While some euro area member states have launched important reform packages under the pressure of financial markets and often as part of the financial assistance programmes, reform efforts have been much more moderate in the rest of the EU, including in the newer Member States. In the vulnerable economies of the euro area, the reforms though significant, still fall short of the needs: Indicators on labour and product markets for these economies, like the OECD Product Market Regulation indicator or the Employment Legislation indicators still point to higher than average regulatory obstacles in the euro area economies. Substantial reforms in these countries addressed the labour market rigidities, in particular those linked to wage setting mechanism, differences in employment protection between permanent and temporary contracts to mitigate segmentation, and active labour market policies. Product market reform and improvement of the business environment have progressed in a patchier and slower way, though actions have been taken to modernise public administrations. A renewed commitment to structural reforms in the EU is essential for Member States to grow out of debt and to stimulate the creation of more and better jobs. Progress at national and EU level in areas like services, energy, telecoms and the digital economy, as well as in improving conditions for business create new opportunities for jobs and growth. Cutting „red tape“ at the European and national level as part of the Better Regulation Agenda is essential to create the right regulatory environment and promote a climate of entre-

preneurship and job creation. This requires national ownership and commitment at the highest government level as well as by national parliaments.

These reforms can have significant effects on productivity and growth. The European Commission has reviewed various reforms undertaken by the euro area member states most hit by the crisis and brought evidence that the microeconomic transmission channels of product market reforms and improvement in the business environment were bearing fruit.[1] In addition, signs of competitiveness gains through moderate unit labour cost increases and better export performance have helped macroeconomic rebalancing in the euro area in the last four years. The strength of the recovery in countries like Spain and Ireland also reflects a better macroeconomic dynamism after reforms.

Chart 2

GDP effects of closing half the gap with best practice



Source: Varga and in't Veld (2014).

The European Commission has simulated the GDP effects if each Member State closes half the gap vis-à-vis best performers.[2] The EU GDP after 5 years could be as much as 3½% higher and after 10 years even 6,5% higher. The positive effects of reforms take time to materialise, depending on the nature of the reforms. The effects of a tax shift (away from labour) materialise relatively fast, while the effect of labour market reforms aiming at increasing labour participation take longer to materialise. Reforms aiming at stimulating innovation and improving education have the longest lead times but the highest potential. The benefits of convergence to best practice are potentially large for all countries, but for some countries more than ever. The key take away is that there is nothing inevitable about the observed low levels of growth. To a large extent it is a political choice.

The investment plan for Europe

Structural reforms and investment are two sides of the same coin. Both are needed to modernize the European economy. They are mutually reinforcing and need to be implemented in parallel. Investment has suffered during the crisis and this has had a negative impact on both short and long term growth. This is why President Juncker proposed on 26 November 2014 an Investment Plan for Europe aiming at the mobilisation of EUR 315 billion (i.e. 2% of EU GDP) for strategic growth-promoting projects over three years, by providing a new risk-bearing capacity to the European Investment Bank.[3]

[1] *European Commission. 2014. Market reforms at work in Italy, Spain, Portugal and Greece. European economy 5/2014.*

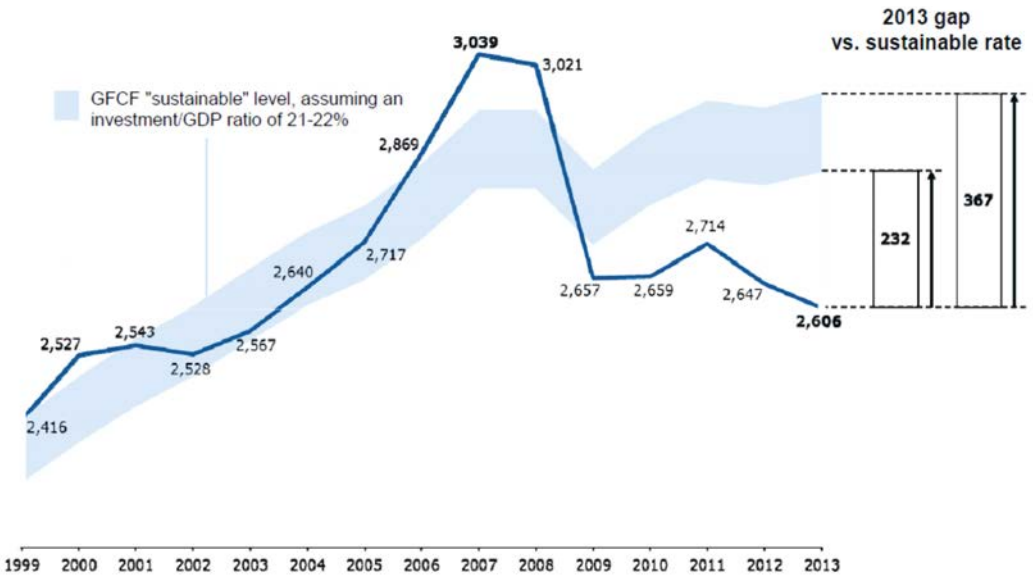
[2] *Varga, J. and J. in't Veld. 2014. The potential impact of structural reforms in the EU – a benchmarking exercise. Economic papers 541. December.*

[3] *European Commission. 2014. An investment plan for Europe – Communication to the European Parliament, the European Central Bank, the European Economic and Social Committee, the Committee of the Regions, the European Investment Bank – COM(2014)903.*

Chart 3

EU-28 real gross fixed capital formation in 2013 – Observed trend versus „sustainable level“

EUR billion



Source: European Commission.

The plan was predicated on two important observations: First, there is no lack of liquidity, but the abundant liquidity is not translated into real investments. Financial fragmentation across the EU, the corporate debt overhang in some countries, the lack of demand and a lack of confidence have been bottlenecks to investment. Second, there is not a single explanation for the drop in investment and hence a comprehensive approach to stimulating investment is called for.

The plan comprises three pillars: first the mobilization of EUR 315 billion in additional investment finance through the creation of the European Fund for Strategic Investments (EFSI) within the European Investment Bank; second, the creation of a strong pipeline of investable projects, inter alia by making available technical assistance through the newly established European Investment Advisory Hub (EIAH); third, the creation of an environment conducive to investment. The last pillar is part of the structural reform and aims at improving the regulatory framework, at national as well as European level, to make it clear and predictable, and to incentivise investment. It includes measures to develop new and alternative sources of long-term financing for the economy and to move towards a Capital Markets Union. It will also benefit from the recently adopted EU initiatives of the Energy Union and the Digital Single Market.

The overwhelmingly positive reception of the Plan and a common understanding on the issues at hand permitted an accelerated legislative process. As a result the EFSI has been established as early as mid-2015. By autumn 2015, all necessary structures will be in place to start implementing the initiatives on the ground. Meanwhile the EIB had already started to finance projects, which are being transferred to EFSI. In other words, the in-

vestments have started already. EFSI will amount to EUR 21 billion, building on a EUR 16 billion guarantee from the EU Budget and a EUR 5 billion commitment of EIB funds. It will generate large investment effects thanks to an expected multiplier of 1:15 which is based on conservative estimates from past experience of EIB funding and EU programmes.

Investment projects will be selected on their own merits, without any sectoral or geographic pre-established allocation, so as to maximize the value added of the Fund. They will need to be economically and technically viable, be consistent with Union policies, maximise where possible the mobilisation of private sector capital and provide additionality. The EFSI will also have the possibility to support together with Member States and/or private investors investment platforms at national, regional or sectorial level.

A preliminary exploration has allowed identifying significant investment needs across the EU, in particular in infrastructures, notably in the transport, energy and electronic communication sectors. The move to a low carbon economy makes energy efficiency projects a policy priority. The modernisation of the EU economy requires investments in education, health and research. The plan will also provide financing to SME and mid cap companies. It is foreseen to generate overall about EUR 240 billion of long term investments projects and an amount of roughly EUR 75 billion for SME cofinancing.

The investment plan is expected to deliver benefits which go beyond the investment boost over the next three years: It will increase the risk bearing capacity of EU funding; it will provide the EU a fully horizontal funding instrument without sectoral or geographical pre-allocation of funding; it will provide channels for the European economy for crowding in private investment in times of persistent budget constraints in the Member States. But the benefits of the investment plan will only materialise if supported by ambitious structural reforms at national and EU level and by an adequate policy mix with responsible fiscal policies.

Klaus Liebscher Award and Maria Schaumayer Scholarship

Klaus Liebscher Award and Maria Schaumayer Scholarship

Is is the 11th time that the Oesterreichische Nationalbank gives the Klaus Liebscher Award to two young researchers in economics. As in all the previous years it has been an extraordinarily difficult task for the jury to select among a large number of excellent submissions the two winning papers of this year.

On the occasion of the 65th birthday of Klaus Liebscher, former Governor of the Oesterreichische Nationalbank (OeNB), the bank in 2005 established the "Klaus Liebscher Award". We did so in recognition of his unrelenting commitment to the cause of European integration and Austria's participation in European Economic and Monetary Union. This award is the highest scientific distinction, the OeNB offers. It is granted every year for up to two excellent papers on European Economic and Monetary Union and European integration issues. Young economists, up to 35 years from EU Member States and EU candidate countries are eligible. The award is worth EUR 10,000. The papers are refereed by a panel of highly qualified reviewers.

The first winning paper of this year is by a young economist: *Anil Ari* from the *University of Cambridge, UK*. His paper has the title: "Sovereign Risk and Bank Risk Taking".

Anil Ari is a Ph. D. candidate in Economics at the University of Cambridge. His main research areas are Sovereign Risk, International Finance, Macroprudential Policy Open Economy Macroeconomics and Fiscal Policy. He holds a BA and a MPhil. in Economics from the University of Cambridge. He will receive his Ph. D. in Economics next year.

The second winning paper of this year is by *Matteo Crosignani* from the *NYU Stern School of Business* in New York. The title of his paper is "Why are banks not recapitalized during crisis?".

Matteo Crosigniani is currently a Ph. D. candidate in finance, expecting his Ph. D. in 2016. He received his B. Sc. from Bocconi University in Milan and his M. Sc. in Finance from the London School of Economics and Political Science. During his undergraduate studies at Bocconi he was also an exchange student at Columbia University. His main

research interests are Financial Intermediation, Non-Standard Monetary Policy and Financial Sovereign Crisis.

Among its numerous activities to support young researchers, the OeNB also awards a grant each year supporting young female researchers in writing their Habilitation thesis. The Habilitation is the highest academic qualification in the Central European tradition: Earned usually after obtaining a research doctorate, such as a Ph. D., Habilitation requires that the candidate writes a professorial thesis (or habilitation thesis) based on independent scholarship, reviewed by and defended before an academic committee in a process similar to that of the doctoral dissertation. However, the level of scholarship has to be considerably

higher than that required for a research doctoral (Ph. D.) thesis in terms of quality and quantity, and must be accomplished independently, in contrast with a Ph. D. dissertation typically directed or guided by a faculty supervisor.

The grant is named after Maria Schaumayer (October 7, 1931–January 23, 2013), who was the President of the Oesterrreichische Nationalbank from 1990 to 1995. She was the first female central bank chief worldwide. Since supporting women in professional careers was always one of Maria Schaumayer's major concerns, it was a natural decision to name this grant for young female researchers in her honor.

This year the Schaumayer grant is awarded to *Karoline Spiess* from the *University of Economics and Business* in Vienna. Karin Spiess holds an undergraduate degree and a doctoral degree in law from this university; at the moment, she is affiliated with the Institute for Austrian and International Tax Law at the Vienna University of Economics and Business. She has specialized in legal issues of taxation, and her habilitation project entitled "Permanent Establishments and Value Added Tax" is also devoted to this topic. The Schaumayer grant will support one year of work on her project.

Session 3
Potential growth: drivers and impediments

Thomas Helbling
Research Department
International Monetary Fund

Perspectives on potential output after the Global Financial Crisis[1]

1 Introduction

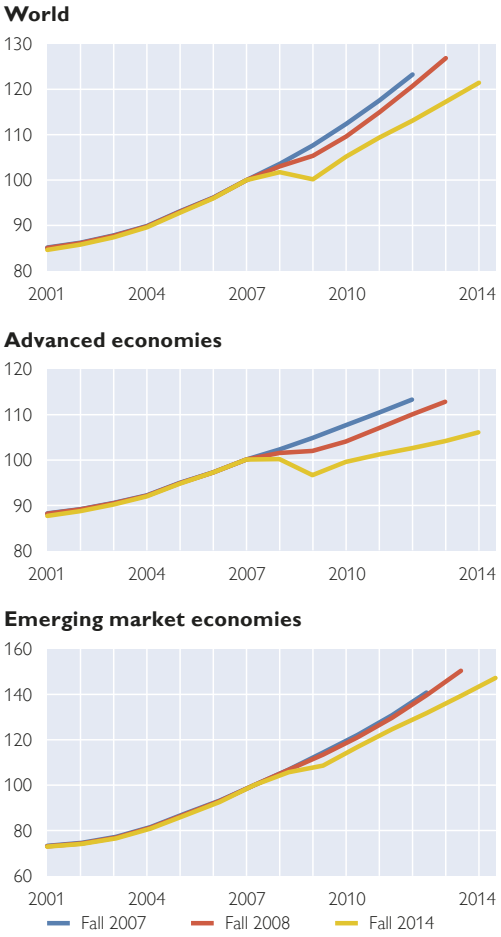
Output in most advanced and many emerging market economies remains much lower than it was projected before the Global Financial Crisis of 2008–09 (chart 1). In the immediate aftermath of the crisis, the damage was expected to be limited to downshifts in the paths of output, while growth would return to pre-crisis rates.[2] Some six years later, it appears increasingly certain that these expectations will be disappointed. There have been serial downward revisions to near- and medium-term growth projections in both advanced and emerging market economies. This protracted period of lower growth suggests that a discussion of economic prospects after the crisis must involve prospects for potential output. Growth is unlikely to have remained so low without potential output having declined as well.

The proposition that potential output growth is lower relative to expectations a few years ago is probably uncontroversial at this point. However, there is less consensus on the reasons and their importance. To gauge the impact of the Global Financial Crisis, it is therefore important to understand both, the channels through which it has affected potential output and the quantitative aspects. There is also a risk of spuriously associating lower potential output with the crisis since it could reflect other factors. Demographic change, for example, is unrelated to the crisis but occurred in parallel. Similarly, as is well known, concerns about slowing productivity growth predate the crisis.

Chart 1

Output compared to pre-crisis expectations

Index 2007 = 100



Source: IMF, April 2015 World Economic Outlook, Chapter 3.

Note: The index is created using real GDP growth rates and its forecasts with 2007=100.

It is therefore important to analyze potential output developments before and after the crisis to allow for the possibility of non-crisis factors having contributed to recent growth disappointments.

Understanding the recent changes in potential output is obviously impor-

[1] *This paper draws heavily on the analysis in Chapter 3 of the IMF's April 2015 World Economic Outlook and the author gratefully acknowledges the inputs from the chapter team.*

[2] *See, among others, Chapter 4 on What is the Damage? Medium-term Output Dynamics after Financial Crises in the IMF's October 2009 World Economic Outlook.*

tant, given the implications for macroeconomic policies. This paper seeks to answer three sets of related questions, highlighting the essential findings from the more detailed analysis of the subject in Chapter 3 in the April 2015 *World Economic Outlook (WEO)*.[3]

- How has the Global Financial Crisis affected potential output? What is the evidence on level versus growth effects?
- What will be the effects from slowing population growth and population aging on potential output?
- Did productivity growth start slowing before the crisis?

As in the WEO Chapter, the analysis in this paper focuses on 16 economies of the G-20, including both major advanced and emerging market economies, for the period 1996–2014.[4] Together, these economies accounted for about three-fourths of global GDP in 2014. The choice of the sample period reflects data availability.

An important premise running through some of the narrative in this chapter is that the direction of causality runs from financial crises to potential output.[5] Conceptually, factors such as hysteresis in labor markets or impaired financial intermediation would inflict damage to potential output. However, as noted by Blanchard, Cerutti, and Summers (2015), reverse causality is a possibility. Supply shocks could lead to lower potential output, which, in turn, could precipitate a financial crisis, due to financial sector stress after actual or expected defaults on loans and debt made before the shocks materialized. The fact that some slowing of potential output growth was observed already before the crisis would argue in favor of such reverse causality. Neverless, it is not clear that these factors could have triggered the financial crisis. Morover it seems implausible that the Global Financial Crisis would not have had any effects on potential output of its own, through the channels noted before. Since much of the empirical analysis is descriptive or does not depend on the direction of causality, the paper mostly asserts causality with plausibility arguments for advanced economies. The issue of causality is much more difficult to resolve for the emerging G-20 economies where key crisis mechanisms do not appear to have played out in the usual fashion.

The structure of the paper is the following. First, it discusses the concept of potential output and how it relates to other concepts used in the context. Second, it presents an overview of developments in potential output over 1996–2014. It then discusses the evidence on the effects of the crisis on potential output, followed by the effects of demographic change. Subsequently, it reviews the evidence on total factor productivity. The final section discusses the implications for prospects for potential output in the 16 economies in the sample.

2 Potential output – a conceptual framework

The paper is based on the traditional view of potential output: the level of output that is consistent with stable inflation. To put it simply, this is the sticky price and wage view of the world. Shocks lead to temporary deviations of

[3] *Readers who are interested in the details of the analysis should consult the chapter. Technical details are discussed in the annexes.*

[4] *The set of countries include the following advanced economies: Australia, Canada, France, Germany, Italy, Japan, Korea, Spain, the United Kingdom, and the United States; and the following emerging market economies are: Brazil, China, India, Mexico, Russia and Turkey.*

[5] *Hall (2014) also uses this assumption.*

actual from potential output because of the slow adjustment in prices and wages.

There are other related output concepts. One is that of *sustainable output*, the level of output consistent with external and financial balance. Imbalances along these dimensions may lead to situations where potential output may not be sustainable even if inflation remains broadly at target. Corrections of such imbalances may subsequently coincide with sharp corrections in output, including potential output. The proposition that financial crises can inflict damage to potential output is plausible and indeed one of the subjects of this paper. The issue is whether one should adjust measures of potential output ex ante because of external and financial imbalances. In the WEO chapter, we take the view that such corrections are likely to be more problematic than helpful. Likelihood and depth of crises depend on many factors, and both dimensions are difficult to predict with estimates of imbalances. Uncertainty about the extent of damage to potential adds yet another layer of complexity.

A second, related concept is that of the *flex-price (flex-wage) output* in dynamic stochastic general equilibrium (DSGE) models. It is closely related to the potential output concept, but, as usual, depends on the underlying model. A critical issue is whether the implied potential output is based on the actual capital stock, or on the counterfactual capital stock that would materialize if prices had been flexible throughout – a potential capital stock of sorts. If it is the latter, the practical relevance is more limited. If the actual output is used, then the traditional and the DSGE concept are the same.

In sum, the New Keynesian approach provides the macroeconomic backdrop to the estimation of potential output in this paper (and in the WEO chapter on which it is based). In this approach, a demand shock would lead to a situation where current inflation is below medium-term inflation expectations while unemployment is above the natural rate of unemployment (specifically the non-accelerating inflation rate of unemployment or NAIRU). The flipside is that the constellation of inflation relative to expectations and unemployment relative to NAIRU also allow inference about underlying shocks.

In this spirit, the empirical analysis in the WEO chapter estimates potential output using a New Keynesian model with a Phillips curve and an Okun relationship between cyclical unemployment and the output gap.[6] The model is cast in a state space format where potential output and the NAIRU are latent variables, with some restrictions on the variances of the shocks to these variables. It is estimated using Bayesian techniques.

Macroeconomic conditions are essential for identifying and estimating potential output, but to understand its fluctuations and its prospects, the most

[6] *See Blagrave and others (2015).*

intuitive way is to understand the supply side of it. To this end, the analysis also uses growth accounting, where the growth of the estimated potential output is decomposed into the changes of the underlying factors of production and total factor productivity (TFP). The latter is a residual, given that actual data are used for employment and capital, while potential output is estimated with a New Keynesian approach.

As is well known, annual employment, capital utilization, and TFP growth tend to be highly procyclical if not filtered, and we look at average

growth and contributions over several years to reduce the cyclical influences. We will distinguish three periods. The first one is that of 1996–2000, the years of the IT revolution in the advanced economies; the second one is 2001–07, the period of rapid global growth after the 2000 recession; and third one is the period after the Global Financial Crisis, 2008–14. To examine the impact of the Global Financial Crisis, the paper mainly looks at the changes between the second and the third period.

Besides the usual growth accounting decomposition, the analysis also employs cohort models of labor force participation to account for shifts in trend labor force participation rates, the second key demographic variable besides the size and growth of working age population.[7] In this approach, aggregate participation rates are influenced by demographics (e.g. changing shares of younger versus older cohorts) as well as other factors, such as gender-specific and birth year-specific factors (e.g. changes in educational attainments across cohorts).

3 Potential output in 16 major economies from 1996 to 2014

As a start, it is helpful to compare actual growth and the estimates of potential output growth in the 16 economies under consideration (chart 2). Two features stand out.

- Potential output growth in the 10 major advanced economies already started to decline in the early 2000s. It reached a low point in 2009, and has recovered slightly since. Compared to the second half of the 1990s, potential output growth was still noticeably lower in 2014 despite some rebound after the crisis. The decline was broad-based and is not driven by one or two economies.
- Potential output growth in the 6 major emerging market economies increased by about 1½ percentage points between the late 1990s and the eve of the Global Financial Crisis. Since then it has declined, and at around 5¼%, it was lower in 2014 than it was in the mid-1990s. As with advanced economies, magnitudes of decline differed across countries, but the decline was universal.

Reflecting the opposite directions of change in potential output growth before and after the crisis between advanced and emerging market econo-

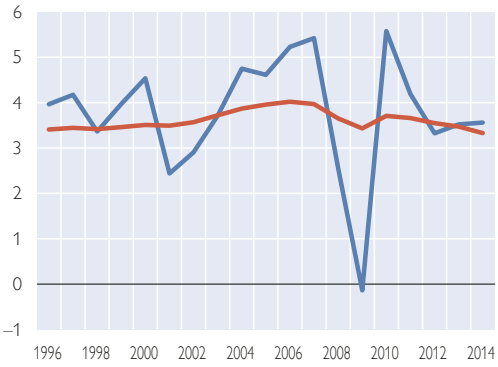
[7] *See, among others, Balleer et al. (2014) for an empirical application based on this class of models.*

Chart 2

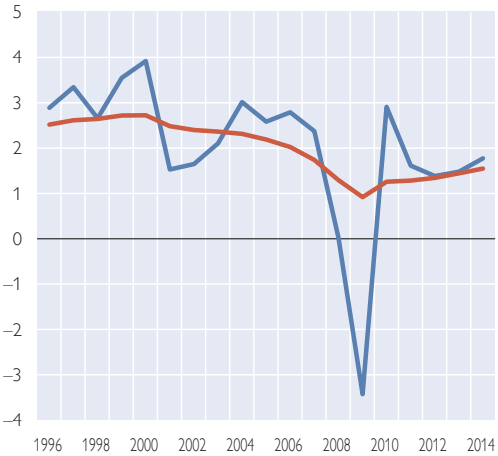
GDP growth

%

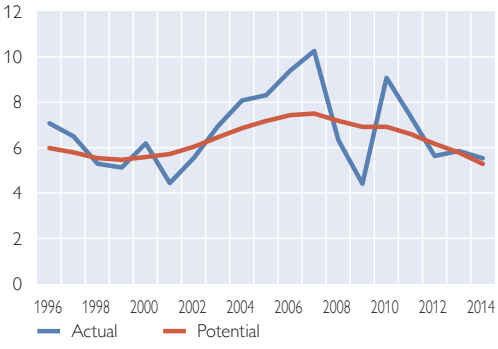
16 G-20 economies



Advanced G-20 economies



Emerging G-20 economies



Source: IMF, April 2015 World Economic Outlook, Chapter 3.
Note: Aggregations are based on standard WEO PPP weights.

mies, potential output growth for all 16 economies has been relatively more stable. Nevertheless, on the basis of purchasing power parity weights, it increased from about 3¼% in the mid-1990s to about 4% in 2007 and has decreased back to around 3¼% since. The broad picture, therefore, is one of slowing or relatively lower potential output growth in the major economies.

4 Dissecting potential output developments in advanced G-20 economies

Turning to the factors influencing fluctuations in potential output, analyzing the supply side provides for an intuitive approach to answering the questions set out in the beginning of the paper. Specifically, we now turn to analyzing growth in capital and labor, the factors of production, and TFP. This section focuses on the advanced economies, where it seems safe to assume a causal effect from the global financial crisis to potential output since these economies were either directly in the epicenter of the crisis or had very strong financial linkages. For emerging market economies, the causal link is more tenuous, and the paper will look at the supply side in these economies in the next section.

4.1 Capital

Starting with capital, financial crises can lower potential output relative to pre-crisis trends through their negative effects on investment and thus capital growth. These effects operate through standard accelerator effects but also financial channels, including the negative effects of debt and capacity overhangs and the related impairment in financial intermediation, and uncertainty.

Formally, growth in the capital stock K can be expressed as:

$$\hat{K}_t = \frac{\Delta K_t}{K_{t-1}} = \frac{I_t}{K_{t-1}} - \delta = (1+g_I)\frac{I_{t-1}}{K_{t-1}} - \delta = (1+g_I)\frac{I_{t-1}}{Y_{t-1}}\frac{Y_{t-1}}{K_{t-1}} - \delta \quad (1.1)$$

where the notation is standard.[8] The third term highlights that current capital stock growth does not only depend on current investment growth, but also on the investment-to-capital ratio in the previous period. The final term highlights how both, a lower investment ratio and a capital overhang (in the sense of the capital output ratio being above average) will lower this ratio. On both fronts, there can be protracted crisis-related effects on current capital growth even after investment growth rebounds. As noted by Hall (2014), this reflects of the fact that capital is a slow-moving variable.

Looking at the contribution of capital to slowing potential output growth, chart 3 shows that lower capital growth was indeed an important factor in advanced economies between 2008 and 2014, the crisis and post-crisis period. Specifically, it contributed some ¼ percentage point to the average decline in potential output of around 0.8 percentage points between 2001–07 and 2008–14.

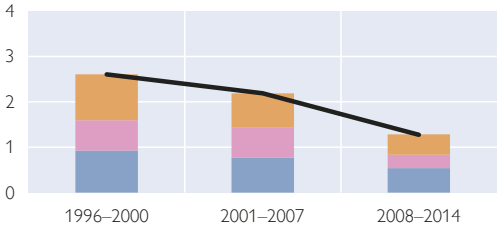
This decline in capital growth after the Global Financial Crisis is consistent with evidence from past financial crises, which suggests that after a crisis, the investment-to-capital ratio stays much lower for at least a decade (chart 4).[9] This evidence is based on applying local projection methods to a cross-section of past crises. Applying the same approach to the advanced economies after the global financial crisis suggests the estimated average decline during 2008 to 2014 was well within the 90% confidence interval. Ignoring potential changes in depreciation rates, the estimated average decline in the ratio of around 1½ percentage points should

Chart 3

Growth accounting for potential output in advanced economies

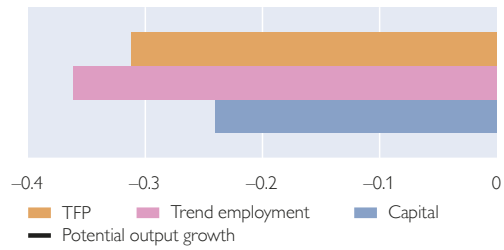
Decomposition

Contributions to growth; period averages in %



Difference 2008–14 compared to 2001–07

Percentage points

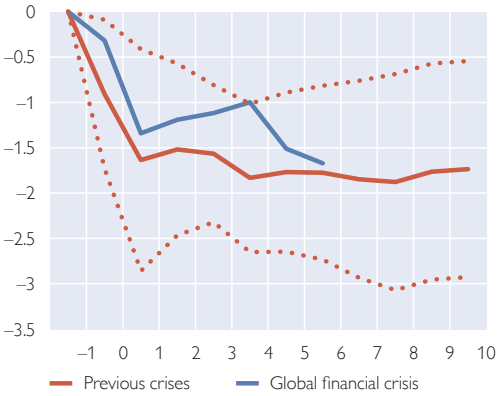


Source: IMF, April 2015 World Economic Outlook, Chapter 3.
Note: Aggregations are based on standard WEO PPP weights.

Chart 4

Investment-to-capital ratio

Crisis impact in percentage points; years before and after crisis on x-axis



Source: IMF, April 2015 World Economic Outlook, Chapter 3.

Note: The blue line represents the effect of the global financial crisis, and red lines represent the effect of previous financial crises (based on the chronology by Laeven and Valencia, 2014) on the investment-to-capital ratio. Dashed red lines denote 90% confidence bands.

[8] *I stands for gross fixed capital formation, δ for the (fixed) depreciation rate, and g_I for growth in gross fixed capital formation.*

[9] *See Furceri and Mourougane (2012) for a related analysis.*

translate into lower capital stock growth of roughly the same magnitude.[10]

This evidence of persistent crisis effects on investment matches evidence based on other approaches.[11] Hall (2014), for example, showed that in the case of the USA, the correction to a capital overhang is protracted. Nevertheless, it is difficult to draw strong conclusions about level versus growth effects based on the evidence presented here. While protracted, the effects could still be temporary in the longer run. For a firm assessment of the effects beyond a 5 or 6-year horizon, one would need to control for other factors that could potentially affect investment. Indeed, the substantial cross-country differences, in previous financial crises as well as in the Global Financial Crisis, suggest that the post-crisis response of investment and capital growth also depends on other factors, such as initial conditions or policy responses.

A final observation concerning capital growth is that it already decline in the early 2000s after the information and communication technology revolution (ICT) revolution from the mid to late 1990s. This decline in investment was widely discussed before the crisis. It highlights that a decline in potential output growth in advanced economies has not just been a phenomenon since the Global Financial Crisis. Its beginning predates the crisis.

4.2 Employment

Turning to the labor, we can decompose growth in trend employment $\bar{E}$ as follows:

$$\hat{\bar{E}}_t = \hat{P}_t + \frac{\Delta \overline{LFPR_t}}{LFPR_{t-1}} - \Delta \bar{U}_t \qquad (1.2)$$

where P denotes working age population, $\overline{LFPR}$ the trend labor force participation rate, and $\bar{U}$ the nonaccelerating inflation rate of unemployment (or the structural unemployment rate for short).[12] We can distinguish two different possible level effects from financial crises when it comes to the trend employment. Such level effects will only have temporary growth effects.

- *Structural unemployment*. Severe recessions, such as the ones after the Global Financial Crisis, can lead to higher structural unemployment because of hysteresis (Blanchard and Summers, 1986). Such effects should be particularly important in economies with rigid labor market institutions (e.g. Blanchard and Wolfers, 2000).
- *Discouraged workers*. High unemployment can also discourage workers from searching for jobs. They will eventually drop out of the labor force, which lowers the trend labor force participation rate. This effect may be particularly relevant when social systems provide incentives for early retirement and older cohorts make up for a sizeable share of the labor force.

Perhaps surprisingly, the decomposition of trend employment suggests that,

[10] *The reason that the implied decline in capital stock growth relative to the average in 2001–07 is somewhat lower than the 1½ percentage points noted above is that the contributions in the chart 4 are GDP-weighted, whereas the average effect shown in chart 3 is not weighted. This matters because the decline in capital growth in some of the larger major economies was more modest than in some of the smaller economies.*

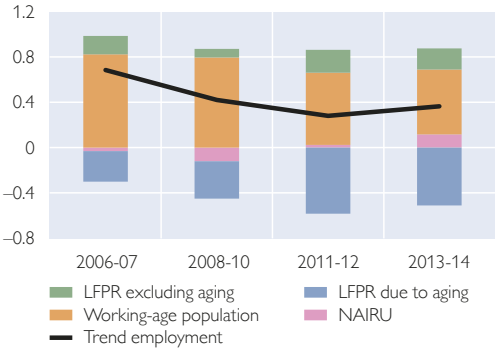
[11] *Chapter 4 of the April 2015 World Economic Outlook presents evidence of protracted accelerator effects in investment after the crisis.*

[12] *The cohort models control for cyclical fluctuations in activity to account for the short-term fluctuations in labor force participation.*

Chart 5

Accounting for changes in trend employment growth in advanced G-20 economies

Contributions to growth; period averages in %



Source: IMF, April 2015 World Economic Outlook, Chapter 3.

on average across advanced economies, the crisis appears to have virtually no important lasting effects (chart 5). As expected, structural unemployment increased during and immediately after the crisis, as shown by the small negative NAIRU effects. However, these effects were subsequently mostly reversed. Similarly, there was a small negative impact on labor force participation (excluding aging) initially, consistent with the discouraged worker effect, but this impact was soon reversed.

Within this general picture, there are important differences across countries. Negative effects from increased structural unemployment, for example, were larger and more persistent in some euro area economies, as it was to be expected. On the other hand, in commodity exporters, there is little change in the NAIRU. Discouraged worker effects seem most relevant for the United States, partly due to the structure of the unemployment insurance system.

The conclusion is that much of the decline in trend employment after the Global Financial Crisis was due to demographics. Annual working age population growth declined, on average, by about ¼ percentage point between 2001–07 and 2008–14. In addition, the aggregate labor force participation rate decreased markedly because of the strong increase in older cohorts. As a caveat, it should be mentioned that there is again considerable cross-country variation. In euro area economies, for example, the negative effects from aging on aggregate labor force participation rates are offset by increasing trend female labor force participation rates.

4.3 Total factor productivity

The effects of financial crises on TFP are ambiguous. On the one hand, investment in research and development is likely to be lower after crises (these expenditures tend to be pro-cyclical), which could contribute to slowing technological progress. Similarly, to the extent that innovation and technological changes are embodied in new capital, lower investment growth could also lead to lower TFP growth. On the other hand, crises might accelerate the Schumpeterian process of creative destruction and provide incentives for firms to improve their productivity.

The empirical evidence unambiguously suggests that the Global Financial Crisis has had a negative effect on TFP growth in advanced economies. As shown in chart 3, on average, TFP growth was about a ½% in 2008–14, a 0.3 percentage point decline relative to 2001–07. Spain and Japan are the only advanced economies that did not register a decline in TFP growth.

While we attribute the decline in TFP growth in 2008–14 to the Global Financial Crisis, it should be noted that the decline could also partly reflect a continuation of developments that were already in train before the crisis. In particular, as noted by Fernald (2014) and others, the exceptional productiv-

ity growth effects of the ICT revolution have been waning since the early 2000s. Indeed, average TFP growth in 2001–07 was already lower than it was in 1996–2000. Besides fading productivity effects from the ICT revolution, the shift from manufacturing and other industries to services might also have contributed to the decline.

4.4 Other considerations

Financial crises can also lead to sectoral reallocation. The shift away from housing and construction after real estate busts is just one example. Such reallocation may affect potential output if productivity levels are very different between sectors or if capital and labor are sector-specific. When changing sectors, these factors of production may thus be less productive, at least initially, depending on whether sector specificity is mostly a short-term friction or a more permanent friction. In any case, this can have negative productivity effects temporarily.

Data availability precludes an analysis of the productivity impact of sectoral reallocation after the Global Financial Crisis. But evidence from past crises suggests that such reallocation explains about half of the observed decline in aggregate labor productivity after crises. Sector-specificity appears to be only one reason for the productivity declines after crises. Another reason appears the sectoral shifts from high productivity sectors such as manufacturing or finance to lower productivity sector, especially in the services sector.

What have we learned about the impact of the Global Financial Crisis on potential output growth in the advanced G-20 economies? Two lessons stand out.

First, the evidence from the growth accounting exercise and the decomposition of trend employment suggests that the crisis has indeed been an important contributing factor. Lower investment and capital growth explains not quite one third of the decline of the average growth in potential output between 2008-14 and 2001-07. If one attributes the entire decline in TFP growth to the crisis, the total contribution rises to more than one half. While one can plausibly argue that part of the TFP growth decline could reflect the

continuation of pre-crisis developments, one would still conclude that the crisis has likely been the most important factor behind the decline in potential output.

Second, most of the decline in average trend employment growth since the crisis is related to demographic factors. Crisis-related factor such as increases in structural unemployment have in general played a surprisingly small and temporary role.

5 Understanding potential output developments in emerging G-20 economies

This section turns to potential output in the major emerging markets economies in the G-20. For these economies, the supply side analysis only starts in 2001, due to data availability issues.

Chart 6 shows the growth accounting exercise for emerging market econ-

omies. The most striking feature of the decomposition is that most of the decline in potential output growth in 2008-14 relative to 2001-07 is due to a decline in TFP growth. In the aggregate, TFP was virtually stagnant in the period after the Global Financial Crisis. The second noteworthy feature of this decomposition is that the contribution of capital was increasing. Unlike in the advanced G-20 economies, there was no apparent crisis-related setback. That said, there only was a strong increase in capital growth in 2001-07. Since 2007, capital growth has been broadly stable at around 8½%. The difference in the average contribution from capital growth in the two periods under consideration thus partly reflects base effects from the increases in the second half of the first period.

The third noteworthy feature is that the contribution from lower trend employment has been relatively stable. This, however, masks important differences across the G-20 emerging market economies in the sample. In China, the growth rate of the working age population slowed markedly in 2008-14 compared to 2001-07, from about 1.8% to 0.8%. In other emerging economies, the growth of the working age population also slowed, but to a lesser extent than in China.

Overall, potential output growth in the emerging G-20 economies has thus became more extensive since the Global Financial Crisis. This pattern of change in the growth accounting for the emerging G-20 economies between 2001-07 and 2008-14 does not lend itself to a standard crisis narrative. Unlike in advanced economies, capital growth did not contract. The hypothesis of investment-embodied technical change would thus not apply either. A gradual decline in TFP growth would, however, be consistent with the convergence hypothesis after a period of rapid growth and catching up or the tendency for regression to the historical

Chart 6

Growth accounting for potential output in emerging G-20 economies

Contributions to growth; period averages in %

Source: IMF, April 2015 World Economic Outlook, Chapter 3.
Note: Aggregations are based on standard WEO PPP weights.

mean after growth spurts (e.g. Pritchett and Summers, 2014).

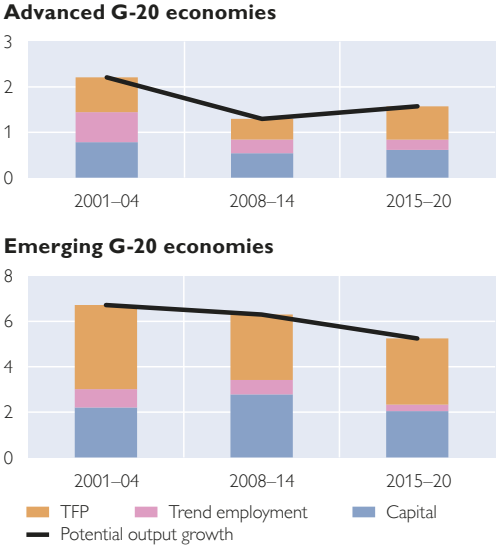
6 Prospects for potential output

Looking ahead, the main question is whether potential output growth in the 16 G-20 economies considered in the chapter is likely to slow further from the average rates recorded in 2008–14 or not. In the April 2015 WEO chapter, IMF staff takes the view that a further slowing is likely in the emerging economies among them, while in the advanced economies potential output growth will, on average, likely pick up slightly in 2015-20 (chart 7). It should be noted that the specific figures presented below are illustrative scenarios. They are essentially based on the "known" inputs (e.g. demographics) or recent WEO projections (e.g., investment). One caveat is that there is considerable uncertainty, not just around potential output, but also around projections of the inputs, including demographics (for example, because of changes in migration patterns). Moreover, the scenarios assume that current policies remain in place.

Chart 7

Potential output scenario for G-20 economies

Contributions to growth; period averages in %



Source: IMF, April 2015 World Economic Outlook, Chapter 3.

Starting with advanced economies, the expectation is that potential output growth will increase slightly from the lows reached in 2008-14, from about 1.3% to 1.6%. Still, this is considerably below the 2¼% recorded during 2001-07. A first reason for the expected increase relative to the post-crisis low is a rebound in TFP, as crisis-legacies wear off and investment recovers. As shown in Chapter 3 of the April 2015 WEO, this recovery in TFP could already be observed in some economies in 2013-14. That said, TFP is only assumed to return to rates seen in 2006-07, when the exceptional growth effects from the information technology and communication revolution of the late 1990s had already worn off. A second reason is that investment ratios (investment as a percent of the capital stock of the previous period) is expected to increase as the global economy improves (as discussed in Chapter 1 of the April 2015 WEO). These ratios are, however, expected to remain below pre-crisis levels, consistent with the evidence of protracted crisis effects from previous financial crises. A further decline in trend employment will partly offset the expected positive effects from TFP and investment on potential output growth. Both working age population growth and labor force participation rates are expected to decline further, the latter because of population aging.[13] In Germany and Japan, the working age population is expected to shrink over 2015-20. If it were not due to labor force participation rates increasing for other reasons (e.g., female labor force partici-

[13] *The United Nation's Population and Development Database is used for projections of demographic variables.*

pation rates), trend employment growth would, on average, be close to zero, rather than the one third of a percent shown in chart 6.

In the emerging market economies of the G-20, potential output growth is, on average, expected to decline further in 2015-20 for three reasons. First, capital growth is expected to slow further temporarily, reflecting higher costs of capital with tighter external financial conditions since the "taper tantrum" in 2013, lower commodity prices (for the commodity exporters among these economies), as well as recent structural constraints (e.g. infrastructure, education and human capital accumulation). Second, IMF staff assumes that TFP growth will not return to exceptional rates recorded before the Global Financial Crisis, reflecting regression toward the historical mean. Regression to the main in TFP growth, to the extent that it was not fully expected, will likely feed back into lower investment. Third, growth in the working age population will likely slow further and some decrease in labor force participation rates due to aging, notably in China.

References

Balleer, A., R. Gomez-Salvador and J. Turunen. 2014. Labour Force Participation across Europe: A Cohort-Based Analysis. In: Empirical Economics 46 (4). 1385–1415.

Blagrave, P., R. Garcia-Saltos, D. Laxton and F. Zhang. 2015. A Simple Multivariate Filter for Estimating Potential Output. IMF Working Paper. International Monetary Fund. Washington. Forthcoming.

Blanchard, O. J., E. Cerutti and L. Summers. 2015. Inflation and Activity: Two Explorations and their Monetary Policy Implications. Paper presented at the ECB Forum on Central Banking. Sintra. Portugal. May 18.

Blanchard, O. J. and L. Summers. 1986. Hysteresis and the European Unemployment Problem. In: Fischer, S. (ed.). NBER Macroeconomics Annual 1986. Volume 1. Cambridge, Massachusetts: MIT Press.

Blanchard, O. J. and J. Wolfers. 2000. The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence. In: Economic Journal 110 (462). 1–33.

Fernald, J. 2014. Productivity and Potential Output before, during, and after the Great Recession. In: NBER Macroeconomics Annual 2014. Volume 29. Chicago. University of Chicago Press.

Furceri, D. and A. Mourougane. 2012. The Effect of Financial Crises on Potential Output: New Empirical Evidence from OECD Countries. In: Journal of Macroeconomics 34 (3). 822–832.

Hall, R. E. 2014. Quantifying the Lasting Harm to the U.S. Economy from the Financial Crisis. NBER Working Paper 20183. National Bureau of Economic Research. Cambridge. Massachusetts.

Laeven, L. and F. Valencia. 2014. Systemic Banking Crises. In: Stijn, M., A. Kose, L. Laeven and F. Valencia. (eds.). Financial Crises: Causes, Consequences, and Policy Responses. Washington. International Monetary Fund.

Pritchett, L. and H. L. Summers. 2014. Asiaphoria Meets Regression to the Mean. NBER Working Paper 20573. National Bureau of Economic Research. Cambridge. Massachusetts.

Session 4
Debt overhang as a drag on growth

Martin Summer
Head of Economic Studies Division
Oesterreichische Nationalbank

Introductory Remarks

Ladies and Gentlemen,
Why is growth still sluggish, even seven years after the financial crisis? The speakers at the conference today have already mentioned some of the main issues that dominate the current debate: The sustained lack of aggregate demand, adverse demographic developments, slowdown in innovation and technological progress, lingering uncertainty and political polarization.

In this session we will focus on another major issue in this debate: Debt overhang. Some authors, most prominently Reinhart and Rogoff (2009 a,b), see the sluggish aftermath of the crisis as a consequence of a significant debt overhang. This focus on debt overhang problems can be traced back to Fisher's theory of debt deflation from 1933. These views are taken up in the recent literature both theoretically and empirically. From the theory side – for example – Fostel and Geanakoplos (2008) and Geanakoplos (2010) investigate the feedback dynamics between leverage and asset prices. Mian and Sufi (2014), using a rich data set on US households, show that debt overhang problems are of first order importance in explaining the exceptionally slow recovery we have experienced. They show for the USA that the magnitude of household leverage can explain the entire decline in house prices as well as the decline in durable consumption.

The overall evidence suggests that the overall debt level as well as the composition of debt plays a key role for the speed of recovery. Debt overhang creates a negative cycle in which growth becomes sluggish as a result of high debt levels. This makes deleveraging harder, feeding again back on slow growth.

I am very happy that we have today two leading experts in the field with us, who will in the next 60 minutes go through some of the aspects of the debt overhang and growth nexus.

Juan Jimeno is Head of the Research Division, Banco de España since October 2004. He holds a Ph. D. in Economics from MIT. Before joining Banco de España, Juan worked as a lecturer at the London School of Economics and as a Professor of Economics at the University of Alcalá. He is an expert in labor economics and macroeconomics and has published widely in these fields. His recent work is focused on the long term consequences of the recent crisis, a field he also worked on intensively as a Duisenberg Fellow of the ECB during 2014. Juan served on various expert commissions and academic boards. He is a Research Fellow of the CEPR (Center of Economic Policy Research) and IZA (institute for the study of labor).

Ugo Panizza is Professor of Economics and Pictet Chair at the Graduate Institute, Geneva. He is also the head of the Department of International Economics and the Deputy-Director of the Institute's Centre on Finance and Development. Prior to joining the Institute, Ugo was the Chief of the Debt and Finance Analysis Unit at the United Nations Conference on Trade and Development. He also worked at the Inter-American Development Bank and the World Bank and was an assistant

professor of economics at the American University of Beirut and the University of Turin. His research interests include international finance, sovereign debt, banking, and political economy. He is a former member of the executive committee of the Latin American and Caribbean Economic Association (LACEA) and an editor of the Association's journal Economia. He is also a member of the editorial board of The World Bank Economic Review, the Journal of Economic Systems, and the Review of Economics and Institutions. He holds a Ph. D. in Economics from The Johns Hopkins University and a Laurea from the University of Turin.

References

Fisher, I. 1933. The debt-deflation theory of great depressions. In: Econometrica vol. 1 no 3. 227–357.

Fostel, A. and J. Geanakoplos. 2008. Leverage Cycles and the anxious economy. In: American Economic Review vol. 98 no. 4. September. 1211–1244.

Geanakoplos, J. 2010. The Leverage Cycle. In: Acemoglu, D., K. Rogoff and M. Woodford (eds.). NBER Macroeconomic Annual 2009 vol. 24. University of Chicago Press. 1–65.

Mian, A. and A. Sufi. 2014. House of Debt: How They (and You) Caused the Great Recession, and How We Can Prevent it from Happening Again. University of Chicago Press.

Reinhart, C. and K. Rogoff. 2009a. The aftermath of financial crises. American Economic Review 99. 339–344.

Reinhart, C. and K. Rogoff. 2009b. This time is Different: Eight Centuries of Financial Folly. Princeton University Press.


LONG-TERM P
FOR ECONOMI

Juan F. Jimeno
Economist
Banco de España

Debt overhang and structural trends: Towards persistent stagnation?

1 Introduction

The recovery from the Great Recession and the subsequent events that initiated the European debt crisis is being very slow. There are not previous episodes of recoveries after recessions, with financial crises or not, when advanced economies showed such a low growth recovery and large negative deviations from projected trends before the crisis. Deleveraging (in the corporate, household, and public sectors) is also taking place very slowly, if anyhow at all.[1] The current macroeconomic scenario seems exceptional in many senses. Among other fears, there are growing concerns about the effects of the crisis on potential output and potential growth (IMF, 2015; Blanchard et al., 2015).

When interpreting these events, there seem to be at least two positions. One is that, because of its global nature and the great size of the leveraging accumulated during the pre-crisis period, rebalancing and deleveraging after the last crisis may take more time than history teaches about the consequences of financial crisis (Reinhart and Roggoff, 2010). A more lasting crisis may give scope for more substantial hysteresis effects and, hence the recovery may be subdued for some time.

Another, more pessimistic, view is that the world economy is bound to enter into a new era of lower or even vanishing growth due to some structural trends that were already present in the pre-crisis period, but they were somehow neglected in the bubbly, expansionary context that generated the dismal economic and financial situation that we are going through. In this gloomy scenario it is very likely the natural rate of interest becomes substantially negative and, if macropolicies are not able or willing to accommodate such a negative rate, the economy is bound to suffer for a persistent shortfall of demand and high unemployment. This is the view that has been associated to the revival of the "secular stagnation hypothesis".[2]

Here, I will argue that the recovery from the crisis is being so slow and seems so problematic, even after the recent upsurge in GDP growth, as a result of the interplay between the debt legacy of the crisis and the structural factors that could slow down economic growth. The interactions go both ways: Structural factors that slow down economic growth in the medium and long-run make deleveraging more difficult and costly, and, on the other hand, adapting to a low growth scenario is made more difficult by the debt overhang generated by the financial crisis.

These structural factors are basically three. One is the declining working age population in many countries, in particular, in Europe. The second is

[1] *See Butiglione, Lane, Reichlin and Reinhart (2014).*

[2] *See Summers (2014) and CEPR (2014).*

population ageing, also expected to be exceptional in Europe. Finally, there is some uncertainty about the extent to which technological progress-based productivity growth can compensate for the demographic trends. In what follows, I will review some theoretical underpinnings of the consequences of the interaction between high debt, low working age population growth, population ageing, vanishing productivity growth, and briefly document in which situation European economies are in these regards.

2 Why the debt overhang could be this time more problematic: Some theoretical considerations

The idea that the demographic prospects and low current and future productivity growth may be the reasons for the slow recovery may seem, at first glance, a bit overstretched. After all, even with declining working age population, in Europe there is high unemployment in many countries and participation rates increased along the crisis (Boeri and Jimeno, 2015), so that there is plenty of labour supply available to give impulse to the recovery.

However, there are reasons to believe that demographic and technological factors could enhance the consequences of the credit cycle and that, together with the deleveraging pressure, may bring the economy into a persistent stagnation. Recently, Eggertsson and Mehrotra (2014) have shown, using a very simple OLG model, how a "secular stagnation equilibrium", with negative interest rates below what monetary policy could deliver, can arise after a deleveraging shock. There are also some papers in the computable large OLG and DSGE approaches, highlighting the role of demographics and productivity growth at determining the natural interest rate and inflation (Kara and von Thaden, 2014; Carvalho and Ferrero, 2014).

In a recent paper (Jimeno, 2015), I have extended the simple OLG model used by Eggertsson and Mehrotra (2014) to consider the interaction between deleveraging, the decline of working age population, and population ageing in a context of low productivity growth and high public debt. I consider three generations: i) a young generation that is credit constrained, does not produce, receives no income, and, hence, consume their borrowings, ii) a middle generation that provides labour, receives all income (labour earnings and capital income, and saves to pay for debt accumulated while young, to buy capital, to lend to the young generation and to hold public bonds, and iii) An old generation consumes all of its savings (plus interest receipts) and government transfers.

In a nutshell, the main mechanisms that determine the effects of deleveraging and supply shocks in this framework, some well-known, others less emphasized before the current revival of the secular stagnation hypothesis, are the following:

- As population growth falls, the natural interest rate also falls. Given the current productivity growth rates registered in advanced countries

(around 1% TFP), the natural interest rate can be significantly negative even with constant population.
- Population ageing implies that there are less young people demanding credit. Moreover, expected transfers to the old generation (for constant public debt) also fall. This is even more so if sustainability of public debt is dubious to begin with.
- A higher current productivity growth rate increases savings. The middle generation pays for its debt accumulated while the youth uses a lower fraction of its income.
- A higher expected productivity growth decreases savings, and expected transfers to the old generation are higher.
- A decrease in the price of capital or a higher depreciation rate pushes the equilibrium real interest rate downwards.
- Fiscal policy has only effects through impact on productivity growth or by changing intergenerational transfers.

The objective of the model is to highlight these transmission mechanisms that arise from the interaction between debt, and demography and technology. A quantitative analysis would require a computable OLG model with a larger number of generations (as in Kara and von Thaden, 2014). Nevertheless, the very radical changes that we are bound to witness in demography and a gloomy scenario for productivity growth suggest that the danger of an extended period of something close to a "secular stagnation" trap is not negligible.

3 Demography, productivity growth and debt in Europe

Declining growth in working-age population and increasing weights of older people in the total population are two demographic trends that originated several decades ago. More recently, both the decline in working-age population and population ageing have accelerated. Currently, in many European countries working-age population is already falling, and will continue to fall through the rest of the century, while the ratio of people over 65 years of age to the working-age population is expected to double in the next three decades (chart 1). Admittedly, there is some uncertainty around population forecasts, but most of it arises from the size of immigration flows, and less from changing fertility rates and life expectancy. The fact that the world working-age population growth is significantly falling suggests that it is unlikely that immigration flows can significantly revert these trends, and more so in a region in which political resistance to immigration seem to be on the rise.

As highlighted by the theoretical framework sketched in the previous section, one important effect of these demographic trends on the savings-investment balance and, hence, on the natural rate of interest, is through the inter-generational transfers that governments could implement in these demographic scenarios given the current high levels of public debt-to-GDP ratios. Currently, pension expenditures in OECD countries, mostly financed by inter-generational transfers under Pay-As-You-Go pension schemes, range from around 5% of GDP, in most Anglo-Saxon countries, to over 10% of GDP, in France, Italy, and other Southern European countries. Assuming employment rates of around 65% of the working-age population, and given the demographic forecast, keeping constant the current ratios of pension expenditures to GDP would require to reduce the replacement ratios of pension benefits (i.e., the ratio of pension benefits to labour earnings) by around 10 percentage points, if the retirement age is sup-

posed to be 65 years, and by around 7 percentage points if the retirement age is supposed to increase to 70 years.[3] This implies that the current cohort of working-age population would have to save significantly more to compensate for the expected reduction of public pensions.

The increase in savings implied by demographic developments and by the outlook of diminishing future transfers to the older population would be smaller, the larger expected labour

productivity growth is. However, labour productivity growth slowed down during the Great Depression and has shown little signs of recovering to the levels registered during the golden ages of the Information and Communication Technology Revolution, even in those countries where the impact of this technological change was the highest. This lack of productivity growth has two components. One is the low investment rate being registered in most countries, which in times of rapid technological obsolescence makes the possibility of diminishing capital-labour ratios very likely. Another is lower Total Factor Productivity Growth. Since it is highly uncertain to what extent other technological advancements could make labour productivity growth to pick up in the near future, productivity gains are to be found elsewhere. Thus, structural reforms aimed at removing product and labour market distortions that impede further productivity growth are becoming the first option in this regard.

As for household debt, there are two elements to consider: its magnitude and its distribution by population age cohorts. Within the euro area, information about household debt and its distribution is available from the Eurosystem Household Finance and Consumption Survey (HFCS), whose first wave was released in 2013.[4] Table 1 provides some data regarding the debt position of household headed by individuals aged 35 to 64.[5] This is the population cohort most affected by the recent accumulation of private debt and whose future savings behaviour will be most conditioned by public debt dynamics over the next decades. As seen in the table, the proportion of household indebted is typically above 50%, reaching more than 60% in Cyprus, Germany, Spain, Netherlands, Finland and Luxembourg. As for debt-to-income ratios, these are especially high in Cyprus, Spain, the Netherlands and Portugal, although net wealth is also high in Cyprus and Luxembourg. In any case, these data suggest that private debt could be a significant burden limiting consumption growth of this population cohort.

[3] *See Jimeno (2015).*

[4] *www.ecb.europa.eu/home/html/researcher_hfcn.en.html.*

[5] *A better measurement of the speed of deleveraging in the household sector in euro area countries and of its distribution across population age cohorts will be available soon with the next wave of the HFCS that will be available at the beginning of 2016.*

4 Concluding remarks

The debt legacy of the crisis, both in terms of high private indebtedness and rising public debt-to-GDP ratios, is made especially burdensome by its coincidence with the demographic decline and dismal expectations of productivity growth, which do not give too much leeway for nominal growth. In this context, not only deleveraging will last longer and be more costly, but also the economy can enter a stagnation trap in which monetary and fiscal policies are to be constrained by the zero lower bound on policy interest rate and the financing needs of the public sector, respectively.

Although there is some heterogeneity across European countries in these regards, all of them are bound to have a significant decline in working age population and a large increase of the retired population, which can only be compensated by higher productivity growth. Recently, productivity-enhancing structural reforms are being strongly advocated by many international organisations and policy institutes. According to the diagnostics in this paper, the fact that these structural reforms are again receiving so much attention is very much justified.

References

Blanchard, O., E. Cerutti and L. Summers. 2015. Inflation and Activity. Two explorations, and their monetary policy implications. In: Proceedings of the ECB Forum on Central Banking, Inflation and Unemployment in Europe. ECB. Frankfurt am Main. Forthcoming.

Boeri, T. and J. F. Jimeno. 2015. The unbearable divergence of unemployment in Europe. In: Proceedings of the ECB Forum on Central Banking, Inflation and Unemployment in Europe. ECB. Frankfurt am Main. Forthcoming.

Buttiglione, L., P. R. Lane, L. Reichlin and V. Reinhart. 2014. Deleveraging?, What Deleveraging? Geneva Reports on the World Economy 16. International Center for Monetary and Banking Studies (ICMB) and CEPR.

Carvalho, C. and A. Ferrero. 2014. What Explains Japan's Persistent Deflation? Work in progress.

CEPR. 2014. Secular Stagnation: Facts, Causes and Cures. R. Baldwin and C. Teulings, (eds.). CEPR Press and Voxeu.org.

Eggertsson, G. B. and N. R. Mehrotra. 2014. A Model of Secular Stagnation. NBER Working paper 20574.

IMF. 2015. Where Are We Headed? Perspectives on Potential Output. World Economic Outlook. April.

Jimeno, J. F. 2015. Long-Lasting Consequences of the European Crisis. ECB working paper 1832. July.

Kara, E. and L. von Thaden. 2014. Interest Rate Effects of Demographic Changes in a New-Keynesian Life-Cycle Framework. In: Macroeconomic Dynamics. Available on CJO2014. doi:10.1017/S1365100514000273.

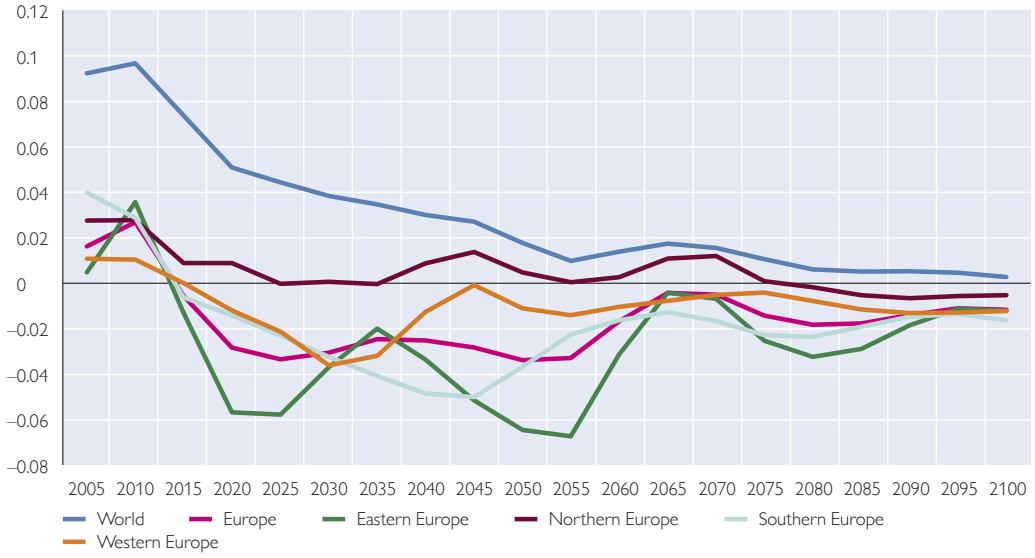
Reinhart, C. M. and K. S. Rogoff. 2010. Growth in a Time of Debt. In: American Economic . eview vol. 100(2). 573–578. May.

Summers, L. 2014. U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound. In: Business Economics. Vol. 49. 2. 65–73.

Chart 1a

Population 20–64 years of age

5-year growth rate

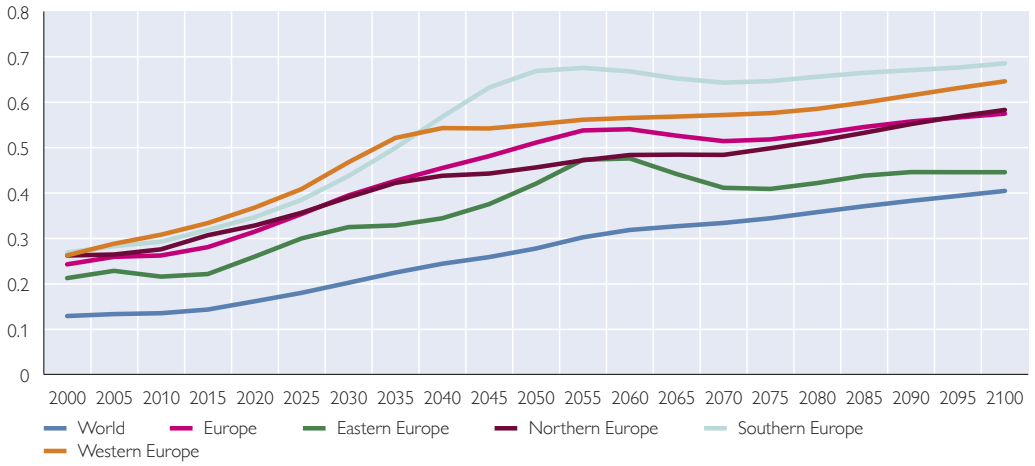


Source: United Nations, Population Division.

Chart 1b

Population over 65 years of age divided by population 20–64 years of age

ratio



Source: United Nations, Population Division.

Table 1

Financial situation of households whose person of reference is 35–64 years old

	Household indebted in %	*Debt to income ratio*	*Net wealth (median, 1,000 EUR)*
Austria	41.99	0.376	128.1
Belgium	56.35	0.656	233.0
Cyprus	76.96	1.451	349.6
Germany	59.9	0.444	77.0
Spain	60.22	0.986	205.3
Finland	68.41	0.72	118.4
France	59.2	0.583	160.5
Greece	45.38	0.511	125.0
Italy	34.39	0.538	190.5
Luxembourg	69.07	0.77	416.6
Malta	42.19	0.494	242.9
Netherlands	67.77	1.988	113.0
Portugal	49.18	1.333	85.8
Slovenia	50.61	0.29	110.7
Slovakia	29.48	0.189	65.3

Source: Eurosystem Household Finance and Consumption Survey.

Ugo Panizza
Professor
The Graduate Institute of International and
Development Studies, Geneva and
Centre for Economic Policy Research

Public debt and long-term economic growth: the research and policy agenda[1]

1 Introduction

I discuss the theoretical and empirical literature on public debt and economic growth and draw some policy implications.

Section 2 suggests that the growth effect of public debt is likely to be small for countries that are far from their debt limit. It can, instead, be substantial for countries that face debt sustainability problems. It would be wrong, however, to only focus on debt levels to assess debt sustainability. Debt composition and many institutional arrangements are as important the level of debt. As a consequence, there are countries that face debt crises when debt hits 60% of GDP (Argentina in 2001) and countries that do not have any problem in rolling over debt ratios which are well above 150% of GDP (Japan).

Section 3 describes the empirical literature and shows that, while there is strong evidence that public debt is negatively correlated with economic growth, we still do not have any evidence of a causal effect of debt on growth or of a non-linear relationship between debt levels and economic growth. Section 4 discusses various measures of public debt and concludes that, because of data availability, the empirical literature on debt and growth is probably focusing on the wrong definition of public debt.

Section 5 asks whether countries should react to a sudden jump in debt with a program of rapid fiscal consolidation. It argues that countries that do not face sustainability problems should do either nothing or do very little. Countries that are close to their debt limit, instead, face more complicated tradeoffs.

2 Theoretical considerations

What does economic theory tell us about the relationship between public debt and economic growth?

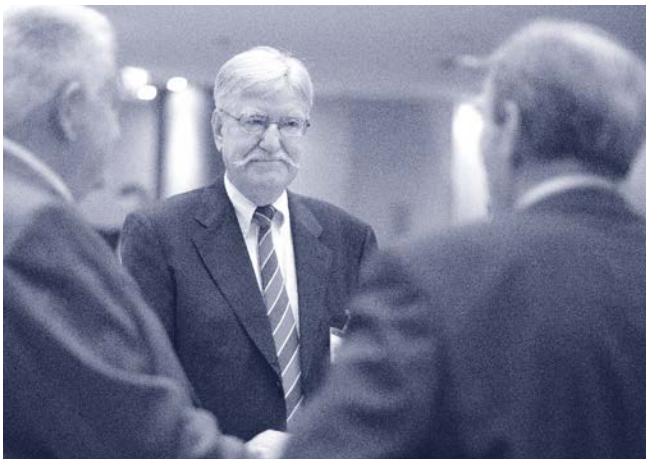
The debt fairy: long versus short-run effects

In their debt fairy parable, Elmendorf and Mankiw (1999) assume that government expenditure in goods and services is fixed and they study what happens if the government decides to temporarily reduce taxes and finance its expenditure by issuing debt. If Ricardian Equivalence does not hold, *short-run* output is demand-determined and the increase in public debt associated with the fiscal deficit will have a

[1] *Delivered at the 43rd Economics Conference of the Oesterreichische Nationalbank, Vienna, June 15–16, 2015. I would like to thank Martin Summer for inviting me to the conference and conference participants for useful comments and suggestions. Sections 2, 3, and 4 of this paper draw heavily on joint work with Andrea Presbitero (specifically on "Public Debt and Economic Growth in Advanced Economies: A Survey," published in the Swiss Journal of Economics and Statistics). The usual caveats apply.*

positive effect on disposable income, aggregate demand, and overall output. The positive effect will be particularly large if output is far from capacity and the central bank does not respond to the expansionary fiscal policy with an increase in the policy interest rate.

Things are different in the *long-run*. If Ricardian Equivalence does not hold, the decrease in public savings brought about by a higher budget deficit will not be fully compensated by an increase in private savings, resulting in lower total investment, either at home or abroad. Lower investment at home will have a negative effect on GDP, as it will lead to a smaller capital stock, higher interest rate, lower labor productivity and wages. Lower foreign investment (or higher foreign inflows), instead, it will have a negative effect on foreign capital



income and will thus lower the country's future GNP. This negative effect of an increase in public debt on future GDP (or GNP) can be amplified by the presence of distortionary taxes.

Panizza and Presbitero (2013) use Elmendorf and Mankiw's (1999) back-of-the-envelope calculations for the US economy and estimate that increasing debt by 100% of GDP would reduce annual GDP growth by approximately 20 basis points in the first twenty years.

The conventional split between the short and long-run effects of debt disregards the fact that protracted recessions may reduce future potential output (as they increase the number of discouraged worker, with the associated loss of skills, and have a negative effect on organizational capital and investment on new activities).[2] In this case, running fiscal deficits (and increasing debt) may have a positive effect on output in both the short and long-run. DeLong and Summers (2012) argue that in a low interest rate environment expansionary fiscal policy is likely to be self-financing.

Confidence

The debt fairy parable rules out uncertainty and assumes that the government will always be able to borrow at a "safe" interest rate.[3] The negative growth effects of public debt could be much larger if high debt increases uncertainty, leads to expectations of future confiscation, possibly through inflation and financial repression (Cochrane, 2011a,b), or is subject to self-fulfilling runs. In these cases, higher debt could have a negative effect, even in the short-run, because uncertainty will lead to lower investment and higher interest rates (this is what Paul Krugman calls the *Confidence Fairy* effect).

High levels of debt may also pose constraints on a country's ability to conduct countercyclical policies, and thus increase output volatility and reduce economic growth.

The relationship between debt and the ability of conduct countercyclical

[2] *There is evidence that recessions have a permanent effect on the level of future GDP (Cerra and Saxena, 2008).*

[3] *This is because the debt fairy parable implicitly assumes that the government will always satisfy its budget constraint. Therefore, the interest rate paid on government bonds does not carry any default risk.*

policies is more likely to depend on the composition of public debt than on the level of public debt. The literature on original sin, for instance, suggests that the presence of foreign currency debt limits a country's ability to conduct counter-cyclical policy (Eichengreen et al., 2007 and Hausmann and Panizza, 2011). The debt intolerance literature suggests that countries with stronger institutions can sustain higher levels of debt (Reinhart et al., 2003). These findings indicate that countries with different debt structures, institutions and monetary arrangements are likely to start facing debt sustainability problems at very different levels of debt.

De Grauwe (2011) was the first to highlight that the presence of *de-facto* foreign currency debt (because the euro cannot be printed by the national central banks that compose the euro area) was a source of financial fragility within the euro area (see also De Grauwe and Ji, 2013 and Dell'Erba et al., 2013) and to recommend that the European Central Bank should act as a lender of last resort for sovereigns facing runs on their government debt.

Non-linearities

A large number of empirical papers find that the relationship between debt and growth is non-linear and characterized by the presence of a threshold above which debt starts having a negative effect on economic growth (see below). While non-linearities and threshold effects could arise from the presence of debt overhang, it is not clear whether a debt overhang argument could be easily applied to rich economies in which the majority of debt-holders are residents (and therefore there is not an external transfer problem).

Non-linearities may arise if there is a tipping point above which public debt suddenly become unsustainable (Ghosh, et al. 2013, provide a formal model). However, I am not aware of any theoretical model that includes such tipping points in a growth framework.[4]

Summing up

Back-of the envelope calculations suggest that debt may have a negative effect on growth, but the effect is likely to be small for countries that do not face debt sustainability problems. This effect may become large for countries which are subject to default risk and (possibly self-fulfilling) debt runs. Whether a country is subject to debt risk, however, does not only depend on the level of debt but it also depends on many cyclical and structural factors.

3 Empirics: Correlations, causality and endogeneity

Reinhart and Rogoff (2010) collect annual data on debt and output growth for 20 advanced economies over 1946–2009 and split their sample into four groups: (i) country-years for which public debt is below 30% of GDP (443 observations); (ii) country-years for

[4] *Checherita-Westphal et al. (2012) develop a theoretical model in which, over the business cycle, debt can only be issued to finance public investment and the optimal level of public debt is determined by the public to private capital ratio that maximizes economic growth. With such a set-up, they show that the level of debt that maximizes economic growth is a function of the output elasticity of the capital stock. However, Greiner (2012) shows that the results of Checherita-Westphal et al. (2012) are driven by the assumption that the deficit is equal to public investment at each point in time. In such a set-up, debt is completely irrelevant and the non-linear relationship between debt and growth is given by the growth-maximizing tax rate. Greiner shows that allowing for a more general debt policy leads to a monotone and negative relationship between public debt and steady-state growth. He concludes that there is no well-specified model that can generate an inverted U-shaped relationship between debt and growth.*

which public debt is between 30% and 60% of GDP (442 observations); (iii) country-years for which public debt is between 60% and 90% of GDP (199 observations); and (iv) country-years for which public debt is above 90% of GDP (96 observations). Next, they compute median and average GDP growth for each group and show that there are no large differ-ences among the first three groups, but that average and median GDP growth are substantially lower in the fourth group.

Reinhart and Rogoff's (2010) influential paper sparked a new literature aimed at assessing whether their findings were robust to allowing for non-arbitrary debt brackets, to controlling for other variables in a proper regression set-up, and to instrumenting public debt to assess its causal effect on economic growth.

Kumar and Woo (2010), Cecchetti, Mohanty, and Zampolli (2012), and Checherita-Westphal and Rother (2012) estimate alternative versions of a dynamic growth model in which GDP growth is regressed on the initial level of per capita GDP, the ratio of public debt over GDP, and a set of controls. In general these papers find that high levels of public debt are negatively correlated with subsequent growth. Some of these papers also find non-linearities indicating that high debt has a negative effect on growth but moderate levels of debt do not reduce growth.[5]

While these papers suggest that there is a negative correlation between debt and growth, none of them provides convincing evidence that debt has a causal effect on growth. Panizza and Presbitero (2014) try to assess causality by instrumenting public debt with the valuation effects brought about by the interaction between foreign currency debt and movements in the exchange rate. The paper shows that the negative correlation between debt and GDP growth vanishes in the instrumental variable regressions.

Cross-country heterogeneity may lead to large biases in the estimated relationship between debt and growth. New panel time series econometric techniques allow moving beyond simple interactive effects and dealing explicitly with a variety of issues related to unobserved heterogeneity and cross-section dependence. Eberhardt and Presbitero (2015) apply these techniques to estimate the relationship between debt and growth in a large sample of advanced and developing countries. Their findings cast several doubts on the pooled model approach used by the majority of the papers that study the empirical relationship between debt and growth. Along similar lines, Kourtellos et al. (2015) use a structural threshold regression model to study the heterogeneous effects of public debt on growth. They find strong evidence for threshold effects based on democracy but no evidence on non-linearities in debt levels.

4 What is public debt anyway?

One issue that is rarely discussed in the empirical literature on the relationship between public debt and economic growth relates to the definition of debt itself. In particular, should researchers focus on gross or net debt? Should they concentrate on explicit debt, or also consider the government's implicit liabilities? Should standard measures of public debt also include the expected value of the government's contingent liabilities? These are diffi-

[5] *Panizza and Presbitero (2013) provide a detailed discussion of these results and conclude that there is no strong evidence of non-linearities and common debt thresholds.*

cult questions for which we do not have clear answers.

The difference between gross and net debt can be very large. OECD estimates show that at the end of 2012, average gross debt in OECD countries was close to 110% of the group's GDP, but net debt was almost 40 percentage points lower than gross debt (table 1 in Panizza and Presbitero, 2013). OECD data include 8 countries for which the difference between gross and net debt is greater than 50% of GDP and 2 countries for which the difference is greater than 100% of GDP. Moreover, there are 5 OECD countries with positive gross debt but negative net debt (in these countries the government's financial assets are larger than the government's liabilities).

While net debt may seem the best measure of government indebtedness, calculating net debt requires a precise evaluation of the government's assets and liabilities. This is a difficult exercise, full of practical and conceptual challenges. As a consequence, while the definition of gross debt is fairly homogenous across countries, each country has its own definition of net debt. Even netting cross-holdings of public sector bonds by separate public entities, and between national and subnational governments is not a simple exercise.[6]

While net debt is usually much lower than gross debt, measures of debt that include the government's future implicit liabilities would yield much higher debt ratios. Hagist et al. (2009) estimate the net present value of future government liabilities and revenues and use the difference between the net present value of future liabilities and revenues to build a measure of implicit government debt. Their calculations suggest that the total debt-to-GDP ratio is often twice as large as gross debt and, in some cases, more than five times the level of the explicit debt-to-GDP ratio.[7] Kotlikoff (2015) suggests

that – thanks to its pension reform – Italy is the advanced economy with the lowest fiscal gap and concludes that: "it's a strange world in which Italy, the developed world's most fiscally responsible country, has to be lectured on fiscal prudence by countries in far worse fiscal shape."

Another problem with the calculations of standard debt-to-GDP ratio figures has to do with sudden public debt explosions linked to the presence of a large stock of private debt. Before the financial crisis, Spain, Ireland, and Iceland were deemed to have solid public finances. It was the economic crisis and the implosion of their banking sys-

[6] *Cowan et al. (2006) show that social security reforms can have very large effects on debt ratios even when they have no effect whatsoever on government net assets.*

[7] *There is also the issue of institutional coverage. Should we focus on central government debt or on general government debt, including debt issued by local governments? Dippelsman et al. (2012) conduct an exercise for Canada and show that, depending on the level of aggregation, in 2010 the Canadian debt-to-GDP ratio ranged between 38% and 104%. They suggest that headline indicators should focus on the broader concept of gross debt. However, very few countries report the data necessary to compute this broad measure of debt.*

tem and that led to a sudden increase in public debt.[8]

Since net debt is hard to compute and rarely comparable across countries, most papers that study the relationship between debt and growth use gross debt; even if this measure of debt is not a good indicator of the government's financial situation.[9]

5 Living with high debt?

In 2007, average public debt in the group of advanced economies that are members of the OECD was 72% of GDP. By 2012, average debt had increased by 34 percentage points (a 50% increase) to 106% of GDP.

A key policy question is whether these countries should live with high debt for an extended period of time or they should try to reduce debt as fast as possible. Section 3 suggests that empirical studies are unlikely to help us to answer this question. We know that public debt is correlated with lower growth, but we do not know whether the relationship is causal and if there is a threshold above which public debt becomes and drag on growth.

Theory, instead, is clearer. It suggests that public debt will have a small negative effect on growth in countries which are far from their debt limits (i.e., in countries where solvency is not an issue) but that the drag on growth can be large in countries which are close to their debt limit. These results are consistent with Eberhardt and Presbitero's (2015) finding that there is substantial heterogeneity in the cross-country relationship between debt and growth.

Theory is also specific about the mechanisms that reduce growth in the first group of countries: (i) higher equilibrium interest rates that crowd out of private investment and (ii) future tax distortions. High interest rates, however, are currently not a problem for countries with strong fiscal fundamentals. As these countries can borrow at either negative or very low interest rates, it is hard to justify a policy of rapid debt reduction on the basis that high debt is crowding out private investment through the interest rate channel. In fact, given that many advanced economies facing infrastructure bottlenecks, it would seem that now is the right moment to issue debt to finance much needed infrastructure projects. It is hard to think that in countries like Germany and the USA there are no public investment projects that have a return which is greater than their current borrowing costs. As investment is the most productive component of public sector expenditure,

[8] *Campos et al. (2006) provide a systematic analysis of the unexplained part of public debt.*

[9] *One reason for focusing on gross marketable debt has to do with the fact that the government needs to refinance all of its debt. Large refinancing needs may erode investors' confidence and ignite a vicious circle which could ultimately lead to a debt crisis. Note that even data on gross debt are not strictly comparable, as definitions of government vary across countries. Finally, it is now recognized that vulnerabilities depend on both debt levels and debt composition (see, for instance, Inter-American Development Bank (2006)) and, unfortunately, it is very hard to find cross-country data on the composition of public debt in advanced and developing economies.*

such a policy could stimulate aggregate demand in the short-run and increase productivity and growth in the long-run.

What about the growth effects of the distortionary taxes needed to repay the debt? This is indeed a cost of high debt. However, front-loading fiscal consolidation only brings this problem forward (Ostry et al., 2015 provide a formal model). Why should we, in order to avoid distortionary taxes in the future, implement distortionary taxes now?[10] This does not mean that higher debt is good. It simply means that – once debt increases – trying to reduce it as fast as possible it may not be the best policy. This may seem to be counterintuitive, but think of it as driving on ice. The best policy is to drive slowly. However, if you find a patch of ice while driving at high speed, you do not want to touch the brakes.

Things are different for countries that are close to (or above) their debt limit. In this case, the costs of debt in terms of uncertainty and rollover risk are high. The best policy would be to have policies that slowly and credibly reduce debt, together with a lender of last resorts that rules out self-fulfilling crises (De Grauwe, 2011). However, a lender of last resort may not be available or credible (Bacchetta et al., 2015). In this case rapid debt reduction may be the best option. It is not obvious, however, if debt reduction should happen through fiscal consolidation or debt restructuring, especially because very few countries are able to implement large and persistent fiscal consolidation programs (Eichengreen and Panizza, 2014).[11]

6 Conclusions

There is strong evidence that public debt is negatively correlated with economic growth, but at this stage there is no evidence of a causal relationship between debt and growth. Thresholds effects are likely to exist, but there is substantial cross-country heterogeneity and the level of public debt is only one factor among many that contributes to debt risk. Therefore, it is wrong to rely on one-size-fits-all debt thresholds to assess debt sustainability.

Countries that are far from their debt limit should not respond to a sudden jump in their debt ratios with a tight fiscal consolidation program. Such a policy would only bring forward the costs of high debt.

Countries that are close to their debt limit face more complicated trade-offs because without a consolidation program they could lose market access. However, the consolidation program may shrink the economy and amplify the debt problem. The first best policy would be a credible program of slow debt reduction with the support of a lender of last resort which rules out a self-fulfilling run. Such a policy, however, is not always feasible. In such a situation, the country should explore alternative policies, all of them difficult and costly.

This is when high public debt hurts.

[10] *Such a policy would make sense only if we think that the fiscal situation is bound to deteriorate over time and therefore future austerity will need to be more distortionary than austerity today (this may be the case in ageing societies, see Jimeno in this volume).*

[11] *For a discussion of sovereign debt restructuring see Panizza (2013) and CIEPR (2013).*

References

Bacchetta, P., E. Perazzi and E. van Wincoop. 2015. Self-fulfilling Debt Crises: Can Monetary Policy Really Help? CEPR Discussion Paper No. 10609.

Campos, C. F., D. Jaimovich and U. Panizza. 2006. The unexplained part of public debt. In: Emerging Markets Review 7(3). 228–243.

Cecchetti, S., M. Mohanty and F. Zampolli. 2012. Achieving Growth Amid Fiscal Imbalances: The real effects of debt in Achieving maximum long-run growth – A symposium sponsored by The Federal Reserve Bank of Kansas City. Federal Reserve Bank of Kansas City.

Cerra, V. and S. C. Saxena. 2008. Growth Dynamics: The Myth of Economic Recovery. In: American Economic Review 98(1). 439–457.

Checherita-Westphal, C., A. Hughes Hallet and P. Rother. 2012. Fiscal Sustainability using Growth-Maximising Debt Targets. Working Paper Series 1472. European Central Bank.

Checherita-Westphal, C. and P. Rother. 2012. The impact of high government debt on economic growth and its channels: An empirical investigation for the euro area. In: European Economic Review 56(7). 1392–1405.

CIEPR. 2013. Revisiting Sovereign Bankruptcy. Committee on International Economic Policy and Reform at Brookings Institution. October.

Cochrane, J. H. 2011a. Inflation and Debt. National Affairs (9). 56–78.

Cochrane, J. H. 2011b. Understanding policy in the great recession: Some unpleasant fiscal arithmetic. In: European Economic Review 55(1). 2–30.

Cowan, K., E. Levy Yeyati, U. Panizza and F. Sturzenegger. 2006. Sovereign Debt in the Americas: New Data and Stylized Facts. RES Working Papers 4480. Inter-American Development Bank. Research Department.

De Grauwe, P. 2011. The Governance of a Fragile Eurozone. Working Document 346. CEPS.

De Grauwe, P. and J. Ji. 2013. Self-Fulfilling Crises in the Eurozone: An Empirical Test. In: Journal of International Money and Finance 34. 15–36.

Dell'Erba, S., R. Hausmann and U. Panizza. 2013. Debt levels, debt composition, and sovereign spreads in emerging and advanced economies. In: Oxford Review of Economic Policy vol. 29(3). 518–547.

DeLong, B. J. and L. H. Summers. 2012. Fiscal Policy in a Depressed Economy. In: Brookings Papers on Economic Activity. Spring.

Dippelsman, R., C. Dziobeck and C. A. Gutiérrez Manga. 2012. What Lies Beneath: The Statistical Definition of Public Sector Debt An Overview of the Coverage of Public Sector Debt for 61 Countries. IMF Staff Discussion Note 12/09. International Monetary Fund.

Eberhardt, M. and A. Presbitero. 2015. Public debt and growth: Heterogeneity and non-linearityMarkus. In: Journal of International Economics. Forthcoming.

Eichengreen, B., R. Hausmann and U. Panizza. 2007. Currency Mismatches, Debt Intolerance, and the Original Sin: Why They Are Not the Same and Why It Matters. In: National Bureau of Economic Research Inc. (ed.). Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences. 121–170.

Eichengreen, B. and U. Panizza. 2015. A Surplus of Ambition, Can Europe Rely on Large Primary Surpluses to Solve its Debt Problem? In: Economic Policy. Forthcoming.

Elmendorf, D. W. and G. N. Mankiw. 1999. Government debt. In: Taylor J. B. and M. Woodford (eds.). Vol. 1 of Handbook of Macroeconomics. Chapter 25. Handbook of Macroeconomics. 1615–1669. Elsevier.

Ghosh, A. R., J. I. Kim, E. G. Mendoza, J. D. Ostry and M. S. Qureshi. 2013. Fiscal Fatigue, Fiscal Space and Debt Sustainability: In: Advanced Economies. Economic Journal vol. 0. F4-F30. 02.

Greiner, A. 2011. Economic Growth, Public Debt and Welfare: Comparing Three Budgetary Rules. In: German Economic Review 12(2). 205–222.

Greiner, A. 2012. Debt and Growth: Is There a Non-Monotonic Relation? Working Papers in Economics and Management 04-2012. Bielefeld University.

Hagist, C., S. Moog, B. Raffelhüschen, and J. Vatter. 2009. Public Debt and Demography – An International Comparison Using Generational Accounting. CESifo DICE Report 7(4). 29–36.

Hausmann, R. and U. Panizza. 2011. Redemption or Abstinence? Original Sin, Currency Mismatches and Counter Cyclical Policies in the New Millennium. In: Journal of Globalization and Development 2(1), 4.

Inter-American Development Bank. 2006. Living with Debt: How to Limit the Risks of Sovereign Finance. Harvard University Press. Cambridge, MA.

Kotlikoff, L. 2015. What's the most fiscally responsible country in the developed world? www.pbs.org/newshour/making-sense/whats-the-most-fiscally-responsible-country-in-the-developed-world/.

Kourtellos, A., S. Thanasis and C. M. Tan. 2013. The effect of public debt on growth in multiple regimes. In: Journal of Macroeconomics vol. 38(PA). 3543.

Kumar, M. S. and J. Woo. 2010. Public Debt and Growth. IMF Working Papers 10/174. International Monetary Fund.

Ostry, J. D., A. R. Ghosh and R. Espinoza. 2015. When Should Public Debt Be Reduced? IMF Staff Discussion Note SDN/15/10.

Panizza, U. and A. F. Presbitero. 2013. Public Debt and Economic Growth in Advanced Economies: A Survey. In: Swiss Journal of Economics and Statistics vol. 149(II). 175–204.

Panizza, U. and A. F. Presbitero. 2013. Public debt and economic growth: Is there a causal effect? In: Journal of Macroeconomics vol. 41(C) 21–41.

Panizza, U. 2013. Do We Need a Mechanism for Solving Sovereign Debt Crises? A Rule-Based Discussion. IHEID Working Papers 03-2013. Economics Section. The Graduate Institute of International Studies.

Reinhart, C. M. and K. S. Rogoff. 2010. Growth in a Time of Debt. In: American Economic Review P&P. 100(2). 573–578.

Reinhart, C. M., K. S. Rogoff and M. A. Savastano. 2003. Debt Intolerance, Brookings Papers on Economic Activity. In: The Brookings Institution vol. 34(1). 1–74.

Hans Jörg Schelling
Austrian Federal Minister of Finance

Restarting sustainable growth: The role of fiscal policy

1 The economic upswing is delayed

When I took over as Minister of Finance in autumn 2014, Europe was in its 5th year of the recession. The aggregate hides, however, important differences between Member States. One can see, that the EU Member States that did their homework in terms of budget consolidation and structural reforms are now in the lead in terms of growth (e.g. Germany, Ireland, Spain). Also Austria did well in the beginning of the crisis. Thanks to the solid fiscal policy before the crisis, Austria had enough leeway to kick-start the economy in the crisis. So the economy was in the recession for one year only and growth picked up in 2010/2011. This is to say, the recession was v-shaped, whilst the European Commission and many others had forecast an L-shaped path of growth. Then we embarked on fiscal retrenchment (0.75% of GDP annually in structural terms over four years in the period 2011–2014. Whilst the nominal deficit dropped below the 3% mark already in 2011; in 2014, we already managed to reach the Austrian medium-term budget objective which was set at 0.45% of GDP.

Notably, in the period 2012–2014 real GDP growth was pretty low in the period 2012–2014 and forecasters see also subdued growth in 2015. Growth is now forecast to speed-up to a range between 1.4% and 1.7% in 2016.

2 Action is required: The need to reform public finances

The crisis has left us the legacy of high public debt which stands at 86.8% in 2015. This was partly caused by the costs of the banking sector to the tax payer. The other important effect is a high tax burden due to a ratio of public expenditures to GDP of 52.3% in 2014, which is among the highest of the OECD countries. Already before the crisis it was clear that the ageing of the population will put additional pressures on public finances. In addition, international institutions have been telling Austria for many years that our federal fiscal relations are complicated, not transparent and inefficient. Last, but not least, there are the banking issues.

3 The way forward has to tackle the problems

3.1 The tax reform

A tax reform was long due! The purchasing power of the people was eroded by high effective tax rates and work incentives were low for the lower incomes. Austria has also lost ground in the ranking of the "Doing Business Report" by the World Bank. In the past, tax reforms were mostly deficit financed. With a record-high debt burden this was no option. We have found a compromise: My first priority was to reduce public expenditures. From the more than EUR 5 billion volume of the tax reform, we agreed on reducing public spending by EUR 1.1 billion as a first step.

Austria is competing with other business locations and labour costs are

comparably high. We have agreed on reducing indirect labour costs as a next step. But we have to create the room for that on the expenditure side first – on all layers of the government. Thus, it will be key that we will agree on a better division of tasks and financing in the upcoming negotiations on the "Finanzausgleich" (Financial Equalisation Scheme).

We also must continue to produce "value-for-money": No red tape, low administrative burden on business, a lean organisation (by region and by function), no duplication of competences, no over-staffing and no under-resourcing. This is, for instance, why the government has set up a working group on administrative reform, the so called Task and Deregulation Commission. In 4 subgroups, it is mandated to come up with recommendations on the

reduction of bureaucracy and on task reform including the institutional relationship between the federal, the state and the municipal level and on economic affairs and on subsidies. At the end of this process – this is my aim – I want to achieve substantial savings on public expenditure. As we could not implement further measures on the expenditure side so quickly, we had to develop other means of financing of the tax reform.

Most controversial is the checking of banking accounts of enterprises and entrepreneurs (which is already possible today). Let me assure you that all these measures are and will continue to be protected by tax secrecy.

The economic research institutes have analysed the tax reform. They confirm the positive effects on growth and employment for Austria. They also confirm that this tax reform will not burden future generations.

3.2 Investing into the future

Let me now turn to my favourite theme. If Austria wants to withstand the pressure of international competition, it must be able to adjust and to innovate. If you look at public finances, a big part of the budget is blocked by unfinanced promises of the past: public pensions amount to 14%of GDP, interest payments for public debt amount to 2.4% of GDP (currently helped by low interest rates). Also health care is costly and expenditures are dynamic due to ageing and technological pressures. To show an example of the ageing issue: In the period 2013–18 pensions in the federal budget (social insurance and federal civil service scheme) will increase by further EUR 4.2 billion. By comparison: looking at expenditures dedicated to the future, public spending on education, families and R&D will rise by relatively moderate EUR 1.3 billion. Due to ageing societies, the trend is expected to even worsen, if no reforms are implemented! This is why I will inaugurate a reform group on pensions to deliver several options for reforms.

On innovation, we must also focus more on e-Government and the working methods of the public administration must be able to meet the requirements of changing demands. I am also happy that we achieved to increase the tax premium for R&D from 10% to

12% in the framework of the tax reform.

3.3 Financing of the economy

The crisis has highlighted the need to have a stable financing of the economy. Despite the problems of Kommunalkredit, HypoAlpeAdria (HETA) and Österreichische Volksbanken-AG (ÖVAG), one can say that unlike other EU Member States, Austria did not experience a credit crunch. This was, of course, helped in the beginning by the government's EUR 100 billion envelope in support of the banks (most of it was dedicated to liquidity support). The crisis has spurred European integration in this field, which I regard as positive for two reasons: First, we have now a level-playing field for the banks due to central supervision and common rules for the recovering and restructuring of banks. Secondly, there is the chance for a truly European financial market with enhancing the efficiency of financing of our economies. The latter is still in the making. The project "Capital Markets Union" is aiming at SME financing. SMEs are the backbone of the Austrian economy.

The crisis has also highlighted one important element, at which my political party for many years hinted. There is a need for high equity capital. Thus, the government has worked on innovative financing, such as crowd funding or new methods of mezzanine financing. Within the tax reform, we have also increased the preferential treatment of buying equity by the employees. Noteworthy, this is also why my party has rejected ideas of taxing embodied capital of companies.

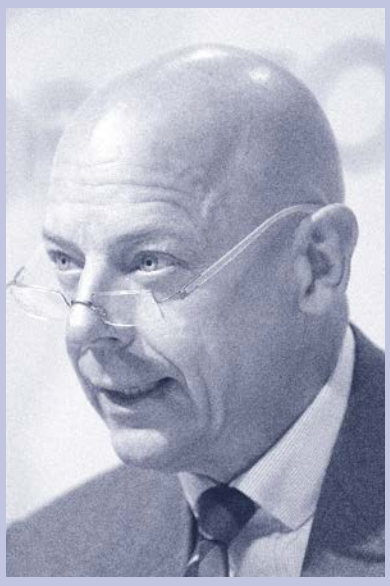
Looking forward to the remaining legislative period, a lot is in the making, but a lot has to be done. Despite the troubles and the heavy workload, I am still very happy to contribute to this work as Minister of Finance.

43rd ECONOMICS CONFERENCE 2015

43rd ECONOMICS CONFERENCE 2015

Session 5
Demography, labor markets, investment and growth

Kurt Pribil
Executive Director
Oesterreichische Nationalbank



Introductory statement

Ladies and gentlemen,
Welcome to our first morning session on "Demography, Labor Markets, Investment and Growth." In this session we will focus on two specific production factors that certainly have a major impact on economic growth: demographic developments and investment finance.

When you imagine the above-mentioned production factors meshing like cogwheels, the obvious questions are: Do they fit together perfectly? Do they interlock smoothly and are they well adapted to supporting long-term sustainable growth? Or is one of them stuck? Good economic policy, like a machine relying on well-functioning cogwheels, largely relies on the good coordination of the underlying drivers.

Let me elaborate on two aspects of demographic developments and investment finance to stimulate and encourage further discussion:

1. On the one hand, we find ourselves in the favorable situation of experiencing a steady increase in life expectancy. This increase is associated with population aging. A higher life expectancy in conjunction with population aging might have negative effects on growth, inter alia because of the related changes in labor market participation.

   On the other hand, we face the factor of migration – both within the EU and from outside the EU. Have we managed to link both aspects: population aging and migration? Can migration – at least to some extent – cushion the potentially unfavorable implications of population aging? Can it, for example, compensate for the reduction of working-age population we would otherwise experience?
2. We currently see a sluggish investment development in Europe. One remedy could be the envisaged Capital Markets Union (CMU). The CMU aims at facilitating raising capital – in particular for small and medium-sized enterprises (SMEs). Among other things, this aim is to be achieved by diversifying the sources of funding. Today, bank loans play a predominant role in many European countries but in the future equity, bonds, securitization as well as lending from insurance companies, asset managers, venture capital and crowd-funding should become more important. Eventually, this means a shift from the traditional bank-based model that is now in place in many European countries to a more market-based system. Are politicians, SMEs and private investors ready for this change?

The obvious question is now: How these production factors and others can be perfectly matched and coordinated that they are working like well-functioning cogwheels?

To do this, it is necessary to abolish the borders, the borders of thinking and to promote networked thinking. And we aim to achieve this with today's conference and today's speakers.

Let me welcome two distinguished speakers to this session who will cer-

tainly give us valuable insights into how demographic developments and investment effect long-term growth and how we can improve conditions in these two fields with the aim of improving growth prospects in the EU.

Our first speaker is Professor *Alexia Fürnkranz-Prskawetz*.

Professor Fürnkranz-Prskawetz is Head of the Institute for Mathematical Methods in Economics at the Vienna University of Technology. Furthermore, she is Director of Research Training at the Wittgenstein Centre for Demography and Global Human Capital as well as Deputy Director and Head of the Research Group on Population Economics at the Vienna Institute of Demography.

Her research interests include long-run population and economic developments, the macroeconomic consequences of population aging as well as the implications of population aging on economic productivity and the labor market.

Currently, she is involved in the project "Ageing Europe: An application of National Transfer Accounts (NTA) for explaining and projecting trends in public finances," which is funded under the EU's 7th Framework Programme. This project aims at explaining changes in taxes, public transfers and services in the light of demographic changes in the European Union.

Our second speaker in this session is *Wilhelm Molterer*.

Wilhelm Molterer has been Vice President of the European Investment Bank (EIB) since 2011.

Before that, he held high-ranking positions in the Austrian government, including Vice Chancellor and Federal Minister of Finance as well as Federal Minister of Agriculture, Forestry, Environment and Water Management. Furthermore, Wilhelm Molterer was a Member of the Austrian parliament for many years.


ÖSTERREICHISCHE NATIONALBANK
EUROSYSTEM
RENCE

Alexia Fürnkranz-Prskawetz
Professor
Institute of Statistics and Mathematical Methods in Economics, TU Wien
Wittgenstein Centre for Demography and Global Human Capital (IIASA, VID/ÖAW, WU)

Demographic change and economic growth[1]

I would like to thank the Oesterreichische Nationalbank for inviting me to review how demographic change has affected economic growth and what impact it might have in the future.

Let me start with a simple cross-sectional plot (chart 1). It shows the annual average growth rate of GDP per capita versus the average annual growth rate of population for the time period 1960–2010. This raises questions about the connections between demographic change and economic growth and the quantitative importance of these relations. As we can see in chart 1, the correlation between GDP per capita growth rates and population growth rates is negligible at low population growth rates and turns negative for higher population growth rates.

Chart 1

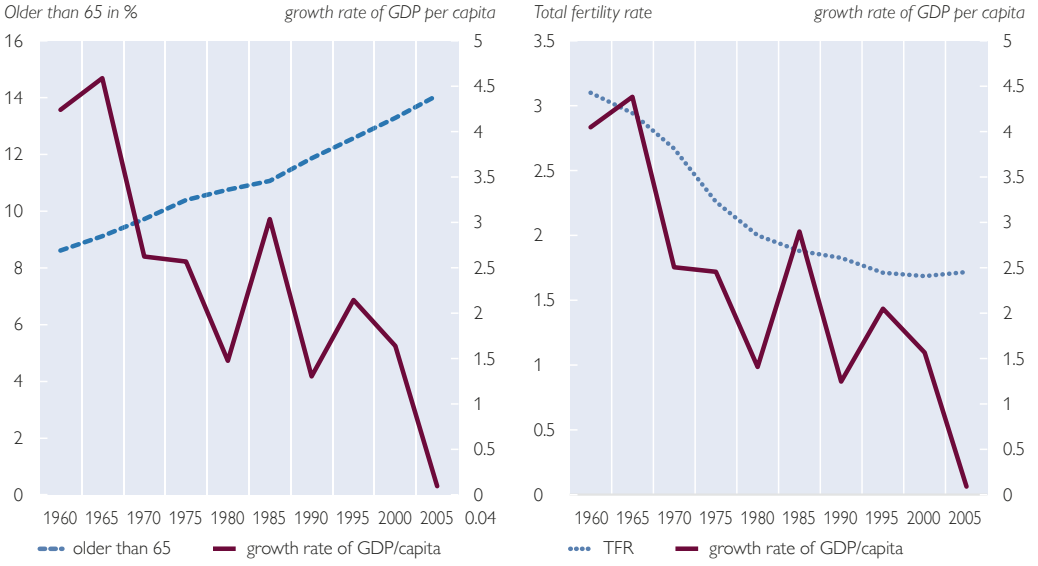
GDP per capita growth versus population growth, 1960–2010

Source: World Bank (2015).

Chart 2 shows the trend of demographic developments in OECD countries over time (1960–2005). The marked increase in the share of people above age 65 (chart 2, left picture) and the declining fertility rate (chart 2, right picture) document the ongoing ageing of the population in these countries. This pronounced ageing process is caused by continuous improvements in

Chart 2

GDP per capita growth, share of elderly from 1960 to 2005



Source: World Bank (2013).

Note: Left picture: Fraction of the population above the age of 65 (in %; dashed line) and the growth rate of per capita GDP (solid line); right picture: TFR and the growth rate of per capita GDP (solid line); the sample represents an aggregate over all OECD countries from 1960 to 2010, where the data is averaged over five years to reduce the influence of business cycle fluctations.

[1] *I am grateful to Klaus Prettner and Sylvia Trnka for proofreading.*

mortality at higher ages and a marked drop in fertility in the 1970s, followed by a stabilisation at low levels of fertility during the past four decades. In the OECD countries, these developments were accompanied by a decrease in the GDP growth rates over the same time period.

However, the stylised facts presented in chart 1 and 2 neither permit us to deduce causalities between demographic and economic developments nor do they help us to grasp the mechanisms that may cause demographic and economic change. We need to analyse how economists have tried to model and understand potential links between these variables.

1 Demographic change and economic growth: a historical review[2]

According to Thomas R. Malthus, there is a strong link between population growth and economic growth. He was the first to endogenously define population growth as being dependent on the state of the economy. As labour grows exponentially and resources only have an arithmetic growth rate, his argument was obviously quite pessimistic in terms of economic growth. As demonstrated in Steinmann's work (1986), such a Malthusian society will ultimately always converge to a low level of output per capita at which the population is in its stationary long-run steady state. The only chance for the economy to converge to a higher standard of living are preventive measures such as restricting marriage behaviour and thereby reducing fertility or positive checks such as famines or other exogenous natural catastrophes. Most importantly, the driving force of the Malthusian model is the negative effect of population growth on output per capita caused by decreasing returns to scale in the factors that can be accumulated.

Besides labour, the neoclassical growth models of the 1960s included physical capital as the second factor of production that can be accumulated. However, these models abandoned the assumption of endogenous population growth and introduced the rate of population growth as an exogenous factor. Similar to Malthus' arguments, their understanding of the relation between economic growth and population growth was pessimistic. In the neoclassical growth models, rising population growth leads to capital dilution thereby reducing output growth in the medium run and leading to a lower output level in the long run. Based on these theoretical arguments, fertility control was seen as a key population policy to foster economic growth. The theoretical framework of the neoclassical growth models could, however, not be verified in econometric studies conducted in the 1960s and 1970s. Various analyses based on cross-country data found an insignificant effect of population growth on economic growth.

In the 1990s, the neoclassical models were extended by directly accounting for human capital as an additional important factor of production. In this context, variations in savings rates and population growth could better explain income differences across countries (Mankiw et al., 1992). Moreover, demographic variables were included in convergence models (Barro, 1991, 1997). The premise underlying these models is based on the neoclassical growth theory in which countries converge to their long-run steady-state equilibrium level of output per worker.

[2] *For a more detailed survey see Prskawetz and Lindh (2007).*

The growth rate of output per worker is modelled to be proportional to the gap between the logarithm of the current level of output per worker and the long-run level of output per worker. While the growth rate is constant, the steady-state equilibrium level of output per worker is assumed to be country- and time-specific and therefore modelled as a linear function of time- and country-specific characteristics. Relying on more sophisticated data and methodologies (panel data econometrics) and disentangling the components of population growth (fertility and mortality), it was possible to identify the link between demography and economic growth in these models. While fertility, population growth and mortality were shown to negatively affect per capita economic growth, population size and its density were shown to be positively related to per capita output growth.

Until the late 1990s, the economic-demographic correlations were modelled at the aggregate level. Thereafter, a new chapter started by modelling the relationship between demographic change and economic growth. Several economists (most prominently Bloom and Williamson, 1998; Bloom et al., 2001; Kelley and Schmidt, 2005) argued that demographic change is important for economic growth if we take into account the change in the population's age structure, i.e. if we abandon the assumption of a stable age distribution. The theoretical foundations can be found in the life cycle models of savings and investment (Modigliani and Brumberg, 1954) and the fact that labour productivity changes by age. While the growth rate of the working age population was shown to have a positive and significant effect on the growth of GDP per capita, the growth rate of the total population was shown to have a negative and significant effect, as clearly stated by Bloom et al. (2011):

> *"... based on the fact that people's economic needs and contributions vary over the various stages of life ... key drivers of economic growth such as aggregate labor supply, productivity, consumption, savings will tend to vary depending on where most people fall in the life cycle."*

2 Age structure changes and economic growth

To understand how the age structure may influence economic growth let us refer to a simple organising framework as summarised in Kelley and Schmidt (2005), where $y=Y/N$ denotes output per capita with Y representing output and N the total population, $z=Y/L$ denotes output per worker with L being the work force and $l=L/N$ denotes the ratio of workers to the total population. The growth rate[3] of output per capita $\hat{y}$ can be decomposed into two terms: the growth rate of output per worker $\hat{z}$ (termed the productivity effect) and the growth rate of the ratio of workers

[3] *A hat on top of a variable indicates the growth rate.*

to the total population $\hat{l}$ (termed the accounting effect).

$$\hat{y}=\hat{z}+\hat{l}$$

This decomposition nicely illustrates that demographic change will definitely influence the accounting effect which can be decomposed further into the difference between the growth rate of the working age population and the growth rate of the total population: $\hat{l}=\hat{L}-\hat{N}$. If the growth rate of the working age population exceeds the growth rate of the total population (i.e. the demographic dividend), the accounting effect makes a positive contribution to economic growth. If the growth rate of the population exceeds the growth rate of the working population, the term $\hat{l}$ becomes negative and the accounting effect acts as a demographic burden.

In addition to the accounting effect, a change in the demographic structure will also affect the growth rate of output per worker, which is often called (labour) productivity or behavioural effect. It has been found that the growth rate of the working age population not only determines the accounting effect but also has a positive effect on the growth rate of output per worker. Among the various demographic variables introduced, the youth dependency ratio turned out to be significantly negatively related to output per worker in most of the studies.

Bloom and Williamson (1998) investigated the role of age structure changes for economic growth in Asia during the demographic transition. Rising youth dependency ratios and the fact that the population grew faster than the working age population led to a demographic burden until the mid-1960s, while a demographic dividend with declining youth dependency ratios and growth rates of the working age population exceeding the growth rates of the total population have been observed since the 1970s. The authors conclude that *"The demographic dividend … in East Asia … accounts for as much as one third of its economic growth."*

For Europe, Kelley and Schmidt (2005) found that the accounting effect was exhausted in the 1970s while the decline in the youth dependency had a strong positive effect on the growth rate of output per worker during the 1970s and 1980s. Among other explanatory variables, Kelley and Schmidt (2005) noted that human capital (as measured by life expectancy and education) induced strong growth whereas financial and political components had more ambiguous impacts. Overall, Kelley and Schmidt (2005) concluded that demographic variables account for 24% of the variability in the growth rate of output per capita for Europe over the time span 1960–1995. Similar results were obtained in the study by Bloom and Williamson (1998) who showed that population dynamics explain almost 20% of the growth observed in Europe over the time period 1965–1990.

As proposed by Bloom and Williamson (1998), demography may influence economic growth through savings and investment. Moreover, educational enrolment and human capital

were emphasised as a third channel through which demography may affect economic growth (Bloom and Canning, 2001). Most importantly, these authors also found a significant effect of the interaction between demographic variables and policies. The role of institutions and policies was also emphasised by Bloom et al. (2003) who showed that open economies, a flexible labour force and modern institutions ensure that a country can actually reap the demographic dividend:

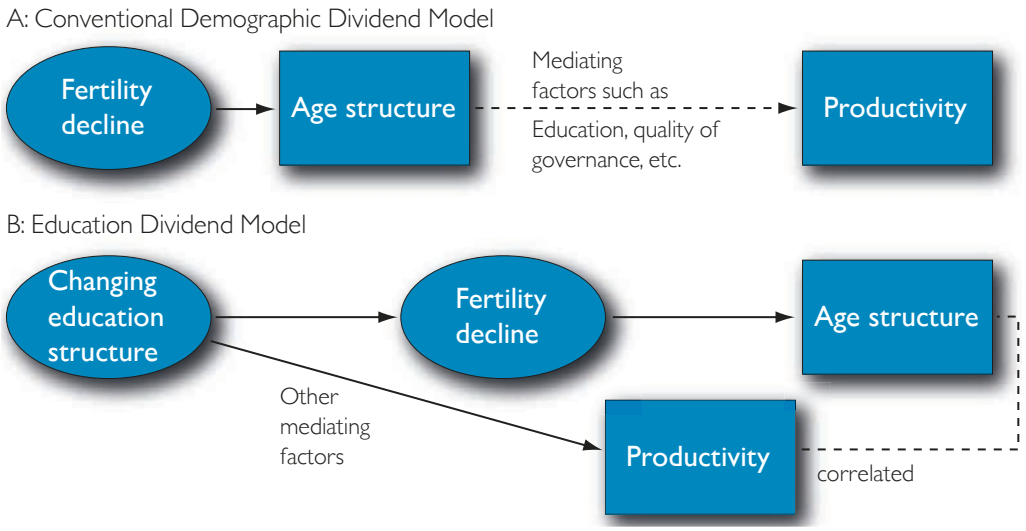
> *"… Demographic dividend (window of opportunity) will depend on critical policy areas like public health, family planning, education, economic policies that promote labour-market flexibility, openness to trade and savings …Policy makers must then plan for future health care and pension-income needs of this baby-boom generation when it ages."*

Other authors (e.g. Feyer, 2007) take into account the internal demographic composition of the workforce and use a sample of OECD countries from 1960 to 1990 to document that the share of workers aged 40 to 49 is positively related to output. Similarly, Prskawetz and Lindh (2007) present growth regressions for a sample of the EU-15 Member States from 1950 to 2005 which show that the share of the working age group 50–64 contributes positively to economic growth, while a large share of old and young population has a negative effect on economic growth.

Cuaresma et al. (2013) challenged the mechanism of the demographic dividend arguing that it might have been an educational dividend. As presented in chart 3 (upper panel), the conventional demographic dividend model argues that the fertility decline initiates a change in the age structure by first inducing a decrease in the youth dependency ratio and subsequently an increase in the growth rate of the working age population as compared to the overall population. Education plays a role in so far as it acts as a mediating factor that is conducive to the role of age structure effects for productivity.

Chart 3

Conventional demographic dividend versus education-triggered dividend model



Source: Lutz (2014).

In contrast, in the education-triggered dividend model (chart 3, lower panel), the changing educational structure is the key driver that initiates the demographic transition and is also positively related to productivity.

With the help of IIASA's human capital database (Lutz et al., 2007) that includes all age-specific educational structures back to the 1970s, Lutz et al. (2008) have shown how important it is to consider the interaction of age and education in economic growth models.

Based on a simple growth regression for a panel of 101 countries over the time period 1970–2000, they were able to demonstrate that secondary education is the most important level of education that determines the productivity of developing countries. The indirect effects that influence economic growth through technology can also be linked to specific age groups and educational levels. The results indicate that technology is positively related to secondary education of older age groups (possibly reflecting the imitation process) and to tertiary education of younger age groups (possibly reflecting the innovation mechanism).

Overall, our analysis of growth regressions that include changing age structures indicates that Europe experienced a demographic dividend in the 1970s and that age structures were also favourable for the productivity process. Whether projected future changes in the demographic structure may induce a burden on economic growth is difficult to answer because this will, among other things, depend on whether and how institutions will adapt to demographic changes. To understand the challenge of demographic change, let us briefly review the demographic development.

3 Demographic change in Europe

In the past decades, demographic change differed considerably in Europe. Chart 4 plots the development of the total fertility rate (TFR) in selected European regions throughout the period 1960–2008. While the overall trend of a decline in the TFR was quite similar across European regions, the timing and extent of the fertility reductions varied. In Northern European and German-speaking countries the fertility decline started during the mid-1960s and decreased to a level around 2 in the early 1970s. In the Southern European countries the drop in fertility was delayed by almost 10 years and reached the level of 2 in the early 1980s. While fertility in German-speaking and Southern European countries continued to drop well below the replacement level of about 2 and stabilised at a value close to 1.4 in the last decade, fertility in Northern European countries stabilised at higher values (around 2), i.e. the replacement level of fertility.

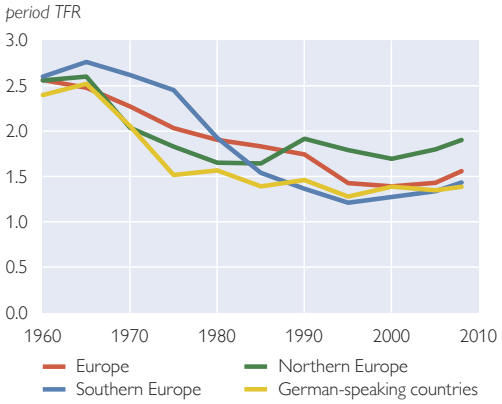
As past fertility developments will have a pronounced effect on population ageing, the challenge of demographic change will be quite different across European regions. In a recent study, Reher (2015) documented the relation between the baby boom and baby bust and its effect on population ageing for several developed countries. The study

showed that in countries with a strong baby boom the baby bust was actually relatively weak. These countries will experience a strong increase in the share of elderly in the period 2010–2050 (e.g. Australia, Canada, Czech Republic, Iceland, New Zealand, etc.). In countries that had a weak baby boom, the baby bust was strong. These countries will experience a strong decrease in the labour force between 2010–2050 (e.g. Bulgaria, Germany, Italy, Poland, Slovenia, etc.). While it will be predominantly the increasing share of the elderly who will exert pressure on the social welfare system, it will be mainly the declining labour force that will reduce output and also decrease the tax base. Hence, the impact on the expected economic effects will depend on whether the baby boom or the baby bust is the dominant historical development.

Parallel to the fertility drop in Europe, gains in life expectancy were very pronounced. While the average life expectancy at birth in the EU was 66.9 (72.3) years for males (females) in 1960, it rose to 76.1 (82.2) years for males (females) in 2012. However, differences in mortality across Europe are striking. In 2013, the lowest and highest levels of life expectancy for males (females) reached 68.7 (78.0) in Lithuania (Bulgaria) and 80.1 (85.2) in Sweden (Estonia). Mortality is also quite different across socio-economic groups within countries: e.g. in Austria, at age 35 the remaining life expectancy for males (females) having only primary school was 41.86 (48.08) and for those having a university degree 48.86 (50.81) in the years 2011/12. Increasing survival to older ages will shape the future of European populations and account for population ageing. However, the fact that gains in life expectancy have been paralleled by gains in healthy life expectancy constitute a great potential and opportunity for societies. Nevertheless, the pronounced diversity in mortality differentials across Europe and across socio-economic groups needs to be addressed.

Chart 4

Period TFR in selected European regions, 1960–2008



Source: Bongaarts and Sobotka (2012).

4 Quantifying economic dependency

Demographic structures are usually summarised by demographic dependency ratios that relate children and the elderly (assumed to be those below age 20 and above age 64) to the active population between age 20 and 64. If we suppose that children and the elderly are dependent and the active population contributes to the economic output, these ratios acquire an economic interpretation. However, such measures are severely flawed if used to represent economic dependency. Not everyone assigned to the dependent population is actually dependent and not everyone who is part of the active population is actually employed. In a recent study (Loichinger et al., 2014), we proposed several alternative economic dependency ratios.

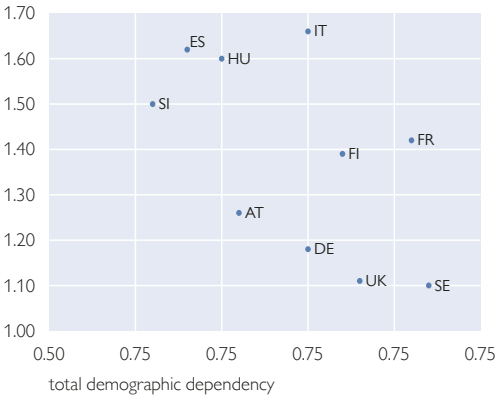
In one indicator, i.e. employment-based dependency, we related non-

working to working persons based on the following definition: we classified children, unemployed, housewives/men, retirees and other inactive persons as non-working population and counted only those as working who actually worked full-time, part-time or did compulsory military or alternative civilian service. Chart 5 illustrates such an employment-based dependency ratio for a set of European countries in 2011 versus the standard demographic dependency ratio. The rather scattered points indicate that countries with a similar demographic dependency ratio (e.g. Italy and Germany) may be very different when we measure dependency by employment status.

To take into account the degree of dependency within the dependent population and the degree of economic ability of those who support others, we also introduced an economic dependency ratio. It is based on the age-specific characteristics of consumption and income elaborated in our work on National Transfer Accounts (Sambt and Prskawetz, 2011). We called the difference between age-specific average consumption and income "life cycle deficit" and alternatively "life cycle surplus" in case the life cycle deficit is negative. We then defined the NTA-based economic dependency ratio by relating the life cycle deficit of the young and elderly to the life cycle surplus of adults. A comparison with the employment-based dependency ratio indicated no obvious correlation. Countries like Sweden and the UK or Slovenia and Italy have similar employment ratios but differ in their economic dependency once we take into account the degree of dependency.

Chart 5

Employment-based and demographic dependency ratios in 2011



Source: Loichinger et al. (2014).

To summarise, when defining the role of demographic structure for economic output we should neither use fixed age limits nor age alone.[4] Not age per se but the economic activity that characterises people will, in the end, determine the economic consequences of demographic change.

5 The challenge of individual and population ageing for economic growth

When viewed at the individual level, the ageing process is quite heterogeneous and varies by educational attainment, work history, family forms, etc. In line with the economic theory of the life cycle model, we expect that a longer healthy life span will affect microeconomic decisions such as education, employment, savings, investment and retirement. However, such behavioural effects may not be supported by prevailing labour market institutions, family and retirement policies, etc. Bloom et al. (2007), for instance, find that the positive effect of increased longevity on

[4] *In a recent paper, Cuaresma et al. (2014) have shown that prospective age measures, i.e. measuring ageing by taking into account remaining life expectancy instead of a fixed chronological age, have better explanatory power in the long run.*

aggregate savings disappears in countries with pay-as-you-go pension systems and high replacement rates. Moreover, norms and values, as well as the current economic situation, may also have an impact on behavioural effects. Indeed, as also argued by Bloom et al. (2011), not the demographic change but rigid policies and institutions are the main problem of population ageing.

At the aggregate level, changes in the age structure will influence the compensation of labour as well as physical and human capital. Substitution among production factors and the economic structure of a country will determine the specific economic consequence of population ageing. How resources will be redistributed across generations will also depend on the respective social security system (including health care, pensions, long-term care insurance).

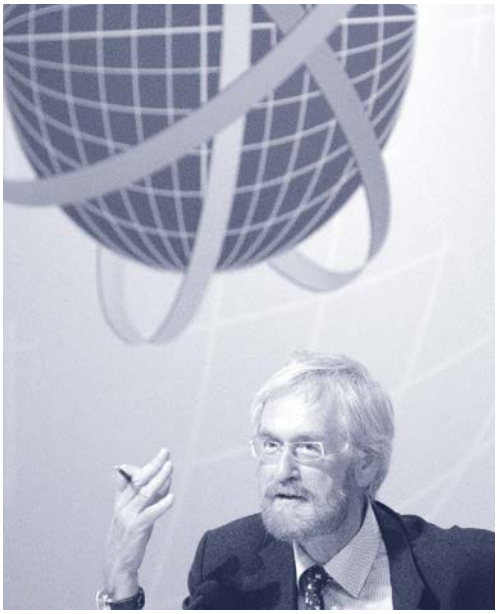
In their papers, Nagarajan et al. (2013a, 2013b) offer an in-depth bibliometric analysis of the impact of population ageing on economic growth and discuss the main channels. They identify three main mechanisms: (1) consumption and saving patterns, (2) public expenditure and (3) human capital. About 70% of all empirical studies that focus on the role of public social expenditure in ageing societies as the main mechanism envisage a negative impact of ageing on economic growth. Arguments in favour of a negative relation include the fact that, in ageing populations, tax revenues will decline as the working age population shrinks, while the demand for health and pension expenditures will increase. In contrast, 60% of all empirical studies that focus on human capital as the key mechanism fail to find a negative relation between population ageing and economic growth. However, there are also the arguments that expenditures for social security benefits may compete with expenditures for education or that an older work force is less productive. It should be noted that these claims failed to be verified in many empirical studies (cf. Prskawetz and Lindh, 2006 and, more recently, Göbel and Zwick, (2012) for a review on age and productivity). The positive relation between population ageing and economic growth is also more relevant for consumption and savings patterns.

According to Prettner (2013), an increase in longevity implies that individuals save more. In standard endogenous growth models, this means that more resources are available for R&D, which, in turn, drives technological progress and thereby productivity growth. For semi-endogenous growth models (where the long-run per capita output growth rate is positively related to population growth), Prettner (2013)

has shown that the relative change of fertility compared to mortality ultimately determines which role population ageing plays in economic growth. Prettner and Timborn (2012) demonstrated that even if the negative effect of low fertility on the flow of labour into the R&D sector dominates in the long run, the positive impact of longevity on savings during the transition overcompensates the negative effect in

the short run. Such stylised facts are consistent with the negative relation between fertility and economic growth observed in many developed countries during the second part of the 20th century. However, continued low fertility and increasing survival to older ages may jeopardise these positive effects in the long run. These studies are in line with literature that investigates the role of longevity on purposeful R&D investment (Hashimoto and Tabata, 2013; Strulik et al., 2013; see also Prettner and Prskawetz, 2010 for a review of the impact of demographic change on economic growth in modern R&D-based economic growth models).

Nagarajan et al. (2013a, 2013b) conclude that we should be cautious when



investigating the relation between population ageing and economic growth. They summarise their findings as follows:

> *"... the impact of ageing on economic growth does not depend on the mechanisms analysed but rather varies according to the empirical methodology used."*

In general, more sophisticated econometric methods such as GMM estimations or simulations such as CGE models yield less negative results. For instance, allowing for endogenous human capital accumulation in CGE models reduces welfare losses of ageing populations.

Most importantly, since ageing is a new phenomenon, we cannot draw on our experience. To quantify the role of population ageing for future economic growth we should not only rely on past econometric studies but also use more complex simulation models that help us understand how population ageing may impact economic growth for alternative future scenarios of behavioural and institutional changes. We need to take into account general equilibrium effects of demographic change on rates of return to labour and capital in a global world where population ageing takes place at different speeds. As illustrated by Krueger and Ludwig (2007), the distribution of wealth and welfare will also be affected. The expected increase in wages and decrease in interest rates might benefit young people with lower levels of assets, while older, asset-rich people might lose in terms of welfare.

To conclude, I would like to emphasise how important it is to "demystify popular fallacies" (Börsch-Supan, 2013) in the economics of ageing. Among the seven myths discussed by Börsch-Supan, let me highlight the fact that ageing is not about the old. We know from various studies that the process of ageing is shaped at young ages. Investments in education and health are prerequisites for successful ageing not only at the individual level but also for societies at large. Investment in skills and education is also stressed in the European Commission's report that discusses the link between demographic change and economic growth (Fotakis and Peschner, 2015):

"Europe and the rest of the developed world …. will need to promote, more so than the developing world, knowledge-intensive, high value added economic activities that generate genuine productivity growth, based on innovation, capital deepening, better organization and greater investment in education and skills for higher-quality workforce."

References

Barro, R. J. 1991. Economic growth in a cross section of countries. In: Quarterly Journal of Economics 106(2). 407–444.

Barro, R. J. 1997. Determinants of economic growth: A cross-country empirical study. Cambridge, MA: MIT Press.

Bloom, D. E. and J. G. Williamson. 1998. Demographic transitions and economic miracles in emerging Asia. World Bank Economic Review 12. 419–455.

Bloom, D. E. and D. Canning. 2001. Cumulative causality, economic growth, and the demographic transition. In: Birdsall, N., A. Kelley and S. Sinding (eds.). Population Matters: Demographic Change, Economic Growth, and Poverty in the Developing World. Oxford: Oxford University Press. 165–197.

Bloom, D., D. Canning and P. Malaney. 2001. Demographic change and economic growth in Asia. Population and Development Review 26. 257–290.

Bloom, D. E., D. Canning and J. Sevilla. 2003. The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change. Rand.

Bloom, D. E., D. Canning, R. K. Mansfield and M. Moore. 2007. Demographic change, social security systems, and savings. In: Journal of Monetary Economics 54. 92–114.

Bloom, D. E., D. Canning and G. Fink. 2011. Implications of population aging for economic growth. Program on the Global Demography of Aging. PGDA Working Paper No. 64.

Bongaarts, J. and T. Sobotka. 2012. A demographic explanation for the recent rise in European fertility. Population and Development Review 38(1). 83–120.

Börsch-Supan, A. 2013. Myths, scientific evidence and economic policy in an aging world. In: The Journal of the Economics of Ageing 1–2. 3–15.

Cuaresma, C. J., W. Lutz and W. C. Sanderson. 2013. Is the demographic dividend an education dividend? Demography. 1–17.

Cuaresma, C. J., M. Lábaj and P. Pružinský. 2014. Prospective ageing and economic growth in Europe. In:The Journal of the Economics of Ageing 3. 50–57.

Feyer, J. 2007. Demographics and Productivity. In: The Review of Economics and Statistics 89(1). 100–109.

Fotakis, C. and J. Peschner. 2015. Demographic change, human resources constraints and economic growth. The EU challenge compared to other global players. Working Paper 1/2015. European Commission.

Göbel, C. and T. Zwick. 2012. Age and productivity: sector differences. De Economist 160. 35–67.

Hashimoto, K. and K. Tabata. 2013. Rising longevity, human capital and fertility in overlapping generations version of an R&D-based growth model. Discussion Paper Series 104. School of Economics. Kwansei Gakuin University.

Kelley, A. C. and R. M. Schmidt. 2005. Evolution of recent economic-demographic modeling: a synthesis. In: Journal of Population Economics 18(2). 275–300.

Krueger, D. and A. Ludwig. 2007. On the consequences of demographic change for rates of returns to capital, and the distribution of wealth and welfare. In: Journal of Monetary Economics 54. 49–87.

Loichinger, W., B. Hammer, A. Prskawetz, M. Freiberger and J. Sambt. 2014. Economic dependency ratios: present situation and future scenarios. Working Paper no. 74. WWWforEurope.

Lutz, W., A. Goujon, S. KC and W. C. Sanderson. 2007. Reconstruction of population by age, sex and level of educational attainment for 120 countries for 1970–2000. Vienna Yearbook of Population Research. 193–235.

Lutz, W., C. J. Crespo and W. C. Sanderson. 2008. The demography of educational attainment and economic growth. Science vol. 319. 1047–1048.

Lutz, W. 2014. POPNET No. 45. 1.

Mankiw, N. G., D. Romer and D. N. Weil. 1992. A contribution to the empirics of economic growth. In: The Quarterly Journal of Economics 107. 2. 407–437.

Modigliani, F. and R. H. Brumberg. 1954. Utility analysis and the consumption function: an interpretation of cross-section data. In: Kurihara, K. K. (ed.). Post-Keynesian Economics. New Brunswick, NJ. Rutgers University Press. 388–436.

Nagarajan, R., A. A. C. Teixeira and S. Silva. 2013a. The impact of an ageing population on economic growth: an exploratory review of main mechanisms. FEP Working Papers no. 504.

Nagarajan, R., A. A. C. Teixeira and S. Silva. 2013b. The impact of an ageing population on economic growth: an in-depth bibliometric analysis. FEP Working Papers no. 505.

Prettner, K. and A. Prskawetz. 2010. Demographic change in models of endogenous economic growth. CEJO 18. 593–608.

Prettner, K. 2013. Population ageing and endogenous economic growth. In: Journal of Population Economics 26(2). 811–834.

Prettner, K. and T. Timborn. 2012. Demographic change and R&D-based economic growth, cege Discussion Paper 139. Department of Economics, University of Goetttingen.

Prskawetz, A. and T. Lindh. 2006. The impact of population ageing on innovation and productivity growth in Europe. Forschungsbericht Nr. 28. Vienna Institute of Demography.

Prskawetz, A. and T. Lindh. 2007. The relationship between demographic change and economic growth in the EU. Forschungsbericht Nr. 32. Vienna Institute of Demography.

Rehrer, D. S. 2015. Baby booms, busts, and population ageing in the developed world. Population Studies Vol. 69. No. S1. 57–68.

Sambt, J. and A. Prskawetz. 2011. National transfer accounts for Austria: low levels of education and the generosity of the social security system. In: Lee R. and A. Mason (eds.). Population Aging and the Generational Economy. A Global Perspective. Edward Elgar. Cheltenham. 256–268.

Steinmann, G. 1986. Bevölkerungsentwicklung und technischer Fortschritt. In: Felderer, B. (ed.). Beiträge zur Bevölkerungsökonomie. Berlin. Duncker & Humblot. 85–115.

Strulik, H., K. Prettner and A. Prskawetz. 2013. The past and future of knowledge-based growth. In: Journal of Economic Growth 18(4). 411–437.

World Bank. 2013. World Development Indicators. Available from: http://data.worldbank.org/data-catalog/world-development-indicators. Accessed on 15. March 2013.

World Bank. 2015. World Development Indicators. Available from: http://data.worldbank.org/data-catalog/world-development-indicators. Accessed on 27. May 2015.

Session 6
The threat of secular stagnation and how to avoid it

Doris Ritzberger-Grünwald
Director of the Economic Analysis Department

The threat of secular stagnation and how to avoid it

The annual growth rates of Austria, but also of many other (mainly EU) countries have disappointed rather often in recent years. Contrary to the U.S.A., where the recovery started right after the Financial Crisis in 2009 and continued steadily thereafter, the level of euro area GDP stagnated (chart 1). The many downward revisions of forecasts which went along with this development have not only destroyed hopes for a pronounced upswing, more jobs and lower unemployment rates. This development has also triggered an intensive debate on growth in general and the multitude of factors and influences in particular. The debate is about sources of growth, about long-run and short-run determinants, about the fluctuations of growth over time and across countries, about its interactions with various other variables and also about the limits of growth. So far the conference has dealt with a large number of these possible perspectives, growth accelerators and growth constraints, in particular in relation to our current difficult situation after the Great Financial Crisis. The last session of this conference looks at the future, looks at the "secular" trends, as the title of this session suggests.

To be precise, the title is not "secular trends" but rather "secular stagnation," which sounds a little bit gloomier. This notion was popularized by

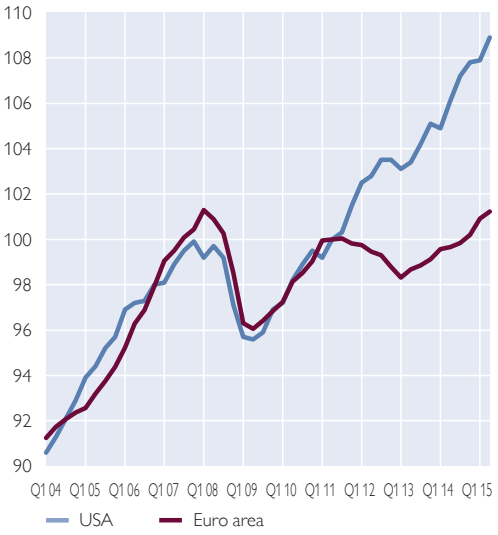
Larry Summers in late 2013 (Summers, 2013), while the expression itself goes back to Alvin Hansen, who coined it in 1938 (Hansen, 1939). The secular stagnation hypothesis usually refers to a situation in which people's propensity to save is high while demand for investment is limited. If these two magnitudes can only be brought into equilibrium at a low or even negative real interest rate, then the economy might become stuck at a suboptimal point due to the zero lower bound on nominal interest rates.

Recently, we have seen many discussions on the topic of secular stagnation. Secular stagnation made headlines in internet fora, and was discussed intensively at academic conferences as well as at meetings of policymakers. In fact, the discussion has been so intense that the phenomenon even gained a

Chart 1

Real GDP

Index, 2011=100



Source: Thomson Reuters.

nickname and it is sometimes simply referred to as "secstag." Some people have argued that "secular stagnation" is a clear and present danger for developed economies around the globe. Others have countered that it constitutes a rather theoretical possibility that can only happen in stylized models but not in the real economy, in particular since real interest rates cannot stay negative for a prolonged period of time. Yet another group has taken a middle ground arguing that the stag-

nation scenario sketched by Larry Summers might not turn out to be of a true secular nature but nonetheless be a major obstacle for the recovery process.

For some of us this debate is déjà vu, as we have had one or the other gloomy debate on economies suffering from no or very low growth rates before. Especially in the 1980s and 1990s, several economists claimed that technological progress was going to reduce the number of working places significantly. Growth would vanish also when households having essentially satisfied their needs would stop spending on additional consumption. Another obstacle for growth was detected in increased environmental standards. Time has proven that the opposite is true. Technological progress has not destroyed the economies. Quite in the contrary, it has increased the affordability of many consumer and investment goods. Innovation has brought us new products, thus creating new needs and therefore additional demand. Even globalization has increased growth, at least in total. The question is if this optimistic view is still the right one, or whether things have changed fundamentally with the Great Financial Crisis. For instance, "trust" seems to have gained a more important role compared to the past, and the same holds true for "expectations." But is this really the case, or are these two terms only the outcome of a new design of economics, which enables us – more or less – to model these things?

In this last session, two outstanding experts will offer their opinions on the presence and the danger of secular stagnation. Professor Carl Christian von Weizsäcker might be one of the few people who were not particularly taken by surprise when Larry Summers turned the attention to the phenomenon of secular stagnation at the end of 2013. In fact, Professor Weizsäcker pre-empted Summers by writing (Weizsäcker, 2011) about an economic situation that very much resembles a secular stagnation, if not by name then by concept. In his explanation he refers to two elements that have a close connection to the location of this conference. First, he relates the size of total savings to the design of the pension system and the prevalence of early retirement, a phenomenon that is not unknown in Austria. And second, he uses concepts from the Austrian capital theory, like roundaboutness, to explain the decrease in investment activity. Professor Nicholas Crafts, on the other hand, warned in a well-received article (Crafts, 2014) that the danger of secular stagnation might well be more rele-

vant for Europe than for the U.S.A. and even more so for the euro area. He offered a number of reasons for this prediction, ranging from demographics to monetary policy. Thus, the next two contributions will give a lot of insight into the ongoing debate and add to our understanding.

References

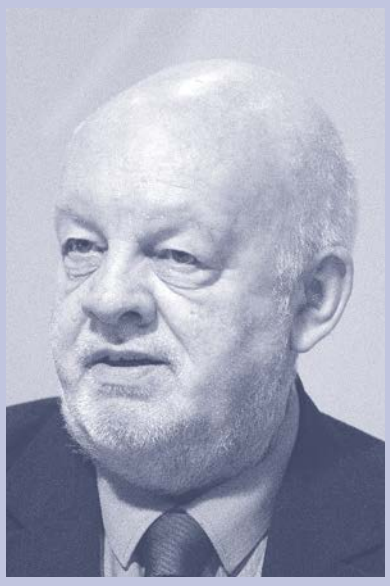
Crafts, N. 2014. Secular stagnation: US hypochondria, European disease? In: Teulings, C. and R. Baldwin (eds.). Secular Stagnation: Facts, Causes and Cures. VoxEU.org eBook. CEPR Press. 91–97.

Hansen, A. 1939. Economic progress and declining population growth. In: American Economic Review 29. 1–15.

Summers, L. 2013. Why Stagnation May Prove To Be The New Normal. In: The Financial Times. December 15.

von Weizsäcker, C. C. 2011. Public Debt Requirements in a Regime of Price Stability. Max-Planck-Institute for Research on Collective Goods. Bonn.

Nicholas Crafts
Professor
University of Warwick



The threat of secular stagnation in Europe: an historical perspective

Long-term secular stagnation is usually seen as an issue of slow trend growth but, in the tradition of Alvin Hansen, it can be regarded as primarily a problem of persistent high unemployment. Trend productivity growth appears to have slowed markedly in Europe recently but this may not be a guide to the future, if robot technology comes through strongly. In that case, however, unemployment of low-skill workers may be a serious secular-stagnation challenge. An adequate response to secular stagnation through fiscal stimulus is infeasible but improved supply-side policies in product and labour markets could provide an answer.

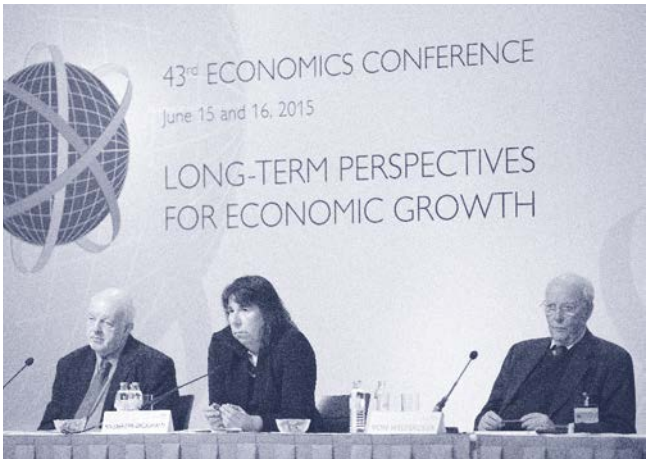
JEL classifications: J68, N14, O52
Keywords: robot, secular stagnation, technological progress, trend growth, unemployment

1 Introduction

The concept of *secular stagnation*, which dates back to the 1930s, has been revived and was recently the topic of a recent e-book (Teulings and Baldwin, 2014). The idea of *secular stagnation* as put forward by Summers (2014) is one of a tendency to deficient aggregate demand such that negative real interest rates are necessary to generate enough investment to stabilize the economy at the NAIRU. This might be a consequence of deleveraging after the financial crisis or a savings glut. If these tendencies are persistent, the economy might face a situation where being in a liquidity trap is the new normal (Krugman, 2014). Serious as these issues may be, they are not the focus of this paper which takes a longer-term perspective as more relevant to the conference theme.

The modern concern with secular stagnation also has a long-term version which relates to a fear that growth prospects in Europe over the medium term are significantly worse than anyone would have thought before the financial crisis. A decline in long-term trend growth of real GDP and, especially, of labour productivity could underlie recent weakness in the European economy and Gordon (2014) sees adverse demography and an absence of new technologies with the impact of the one big wave of the 20th century as reasons to be pessimistic. This could, of course, hold down both investment demand and the neutral real rate of interest.

In contrast, the idea of *secular stagnation* as understood by Alvin Hansen and his followers in the 1930s and 1940s was a tendency to high, persistent and perhaps increasing unemployment over the long-run (Higgins, 1950). As was the case with other contemporaries, Hansen saw prolonged stagnation as giving rise to a hard core of long-term unemployment (1941) or in modern jargon hysteresis effects in the labour market.[1] Hansen's diagnosis



[1] *Observers of the British labour market in the 1930s stressed that prolonged unemployment reduced employability through loss of skills, adverse changes in worker attitudes and unfavourable perceptions of employers (Crafts, 1987).*

of the problem evolved over time. In the early 1930s, in the context of a controversy over *technological unemployment,* he saw the problem as one of insufficient price and wage flexibility to allow adjustment to labour-saving technological change (Hansen, 1932). In the late 1930s, in his best-known discussion of secular stagnation, he argued that the American economy faced a crisis of under investment and deficient aggregate demand since investment opportunities had significantly diminished with the closing of the frontier, declining population growth and a slowdown in technological progress (Hansen, 1939). It was as if the United States was faced with a lower natural rate of growth to which the rate of growth of the capital stock would adjust through a permanently lower rate of investment. In the early 1950s, he endorsed the analysis of Harrod (1948) which saw the possibility of a dynamic equilibrium in which the actual rate of growth was equal to the warranted rate but below the natural rate and unemployment was increasing as demand failed to keep up with technological progress (Hansen, 1951).

Thus, whereas in 1939 the fear was technological progress was too slow by 1951 the problem might be that it was too fast! In any event, once the persistent unemployment problem was thought of as primarily a result of inadequate aggregate demand, a possible response was to use deficit finance to provide fiscal stimulus but then over time secular stagnation would see a steadily increasing stock of public debt (Samuelson, 1970). This potentially raised issues of fiscal sustainability as the public debt to GDP ratio increased, a topic which was explored by Domar (1944).

This paper explores the relevance of these two long-term notions of secular stagnation to post-crisis Europe. The diagnosis of secular stagnation promulgated 75 years ago turned out to be completely wrong but a similar outcome this time may be less likely. Nevertheless, there are some reasons to believe that future trend growth can be stronger than recent performance seems to suggest. However, even if this is the case, the basis may be technological progress which has a strong skill bias and which undermines the employment prospects of low-skill workers. This would be a serious challenge to European labour markets and is unlikely to be amenable to a solution based on increasing government budget deficits. Some policy implications of this analysis are suggested.

2 Secular stagnation first time around: Why was Alvin Hansen wrong?

Alvin Hansen was spectacularly wrong. The United States achieved a strong recovery from the Great Depression post-1933 and in the following decades enjoyed its strongest ever growth performance. The quarter century after World War II was a period of full employment. Neither type of long-run secular stagnation was experienced.

American growth was underpinned by strong total factor productivity (TFP) growth, both in the 1930s and

after World War II; TFP growth in the private non-farm economy was 2.3% per year in the years 1929 to 1941 and 1.9% per year during 1948 to 1973 (Field, 2011). Gordon (2000) described these years as the crest of the *big wave* in long-term productivity growth centred on advances in technologies such as chemicals, electricity, and the internal combustion engine. Field (2011) stressed that technological progress was broadly based and facilitated productivity growth not just in manufacturing but transport, communications, distribution, public utilities etc. while the TFP growth of the 1950s and 1960s was set in train by the national innovation system that had been established during the interwar period. This was based on investments in corporate laboratories and modern universities and delivered a significant fall in the costs of research as experimental science improved and the supply of specialized human capital expanded rapidly (Abramovitz and David, 2001). Private investment as a share of GDP averaged 15.6% during 1948–66 – roughly the level of the 1929 peak – as business responded to the opportunities created by this dynamic economy.[2]

Unemployment in the American economy averaged 4.4% of the labour force during the 1950s and 1960s, perhaps slightly below the NAIRU (Gordon, 1997), and on average only 9.9% of the unemployed were out of work for more than 6 months. One reason for this was that the positive shock of World War II reversed the adverse hysteresis effects of the 1930s Great Depression and the Beveridge Curve relationship between unemployment and vacancies in the 1950s once again looked like that of the 1920s (Mathy, 2015). Another key feature of the period was the ease with which the American labour market accommodated technological progress. If this is viewed through the lens of a macroeconomic production function, then a combination of rising wages, capital deepening, and constant factor shares can be seen as the result of labour-augmenting technological change with an elasticity of substitution between labour and capital less than 1 (Klump et al., 2007). In the race between relative demand and relative supply of college-educated workers, from 1915 through 1980 a very rapid increase in supply was almost matched by high-skill-augmenting technological change which raised the demand for these workers so that the college wage premium decreased slowly (Goldin and Katz, 2008). In terms of occupations, the proportion of low skill employment fell gradually from 40.8% in 1950 to 36.0% in 1970 while high-skill white collar jobs rose from 17.9% to 23.4% in those same years (Katz and Margo, 2013).

By the 1950s, the successful productivity performance of the United States as the leading economy had by the 1950s created a great opportunity for rapid catch-up growth in Western Europe which experienced a Golden Age of growth through the early 1970s (Crafts and Toniolo, 2008). This was based on the rapid diffusion of American technology together with big improvements in supply-side policies including, notably, moves to greater European economic integration stimulated initially by the conditionality of the Marshall Plan and consolidated by the formation of the European Economic Community.[3] The productivity

[2] *In addition, demographic pessimism was confounded and (for reasons that are not entirely understood) the baby boom began in the late 1940s.*

gap between Europe and the United States was rapidly reduced.[4]

In this Golden Age period there was no need for deficit-financed government expenditure to fill a deflationary gap so this Keynesian response to secular stagnation was in abeyance. As Matthews (1968) pointed out with regard to the United Kingdom, a country which was not unsympathetic to such a strategy, the strength of private investment demand rendered such policy actions quite superfluous. Ironically, however, this was a period when, under conditions of financial repression, real interest rates were very low and generally well below the growth rate (Allsopp and Glyn, 1999) and significant primary budget deficits were consistent with a stable public debt to GDP ratio. For example, in the UK case, it would have been possible to run a primary budget deficit of 3.6% of GDP on average throughout the 1950s and 1960s (Crafts, 2015a).

3 European medium-term growth prospects

One way to predict future medium-term growth is to assume that recent trend growth will continue. The trend can be estimated using quite sophisticated time-series econometrics but the analysis is essentially backward-looking. Since recent European growth performance both pre- and post-crisis has generally been disappointing, approaches of this kind are pessimistic about future growth. This is not only true for Europe but also to some extent for the United States where productivity growth slowed down after the information and communications technology (ICT) boom of the late 1990s.

Two methods of trend extrapolation in current use are dynamic factor models which use high-frequency data to try to identify trend and cyclical components in time series of real GDP or real GDP per worker (Antolin-Diaz et al., 2014) and production-function models which infer potential growth by estimating trends in the supply-side sources of growth including capital and labour inputs and TFP growth (Havik et al., 2014). Using the former methodology, Antolin-Diaz et al. (2014) conclude that trend growth both in the United States and also in the euro area has gradually declined since the end of the 20th century very largely as a result of a fall in the trend rate of growth of labour productivity.[5] They find that trend labour productivity growth and labour input in the euro area has fallen to below 1% per year and about 0% per year, respectively, while trend growth of real GDP in the United States has fallen by about 1 percentage point to about 2% per year based on roughly equal contributions from labour inputs and labour productivity growth.

Using the production-function approach, Havik et al. (2014) also conclude that trend growth is now much lower than pre-crisis, as is reported in table 1. The halving of European trend GDP growth which they report is mainly driven by reduced labour productivity growth which in turn reflects weaker trend TFP growth.[6] The results

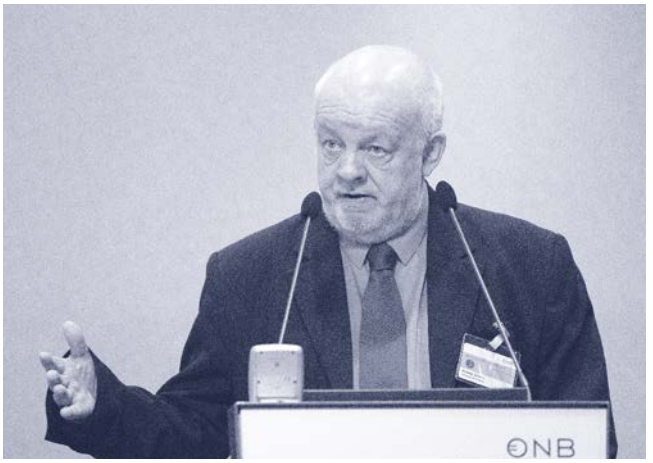
[3] *Badinger (2005) estimated that economic integration had raised European income levels by nearly 20% by the mid-1970s.*

[4] *Real GDP per hour worked in the EU-15 rose from 38.1% of the United States level in 1950 to 62.9% by 1973 (Crafts, 2013).*

[5] *The "euro area" in this analysis is a weighted average of France, Germany and Italy.*

for Europe are actually quite similar to those of the dynamic factor model analysis but, while accepting a growth slowdown, the trends inferred for the United States are rather more optimistic with trend labour productivity growth at 1.5% per year. This is in line with other similar analyses (Fernald, 2014). The striking implication in table 1 is that, rather than catching up as they did for most of the postwar period, in the "new normal" European countries will continue to fall behind the United States in terms of productivity levels. Moreover, Europe appears to be at greater risk of secular stagnation than the United States.

What might a more forward-looking approach say? The best starting point for a discussion of potential long-run trend growth for the euro area is to ask whether the United States is heading for secular stagnation in the long run based on an exhaustion of technological progress (Cowen, 2011) with the implication that future European TFP growth, which relies heavily on the diffusion of new American technology, will be undermined. Mainstream opinion among American economists rejects this secular stagnation thesis. Future technological progress is notoriously hard to predict – 1980s' pessimism was, of course, derailed by ICT – but even Gordon (2014), often cited as a notorious pessimist, expects labour productivity growth at 1.3% per year based on TFP growth around the average of the last 40 years. He argues that the slowdown in technological progress has already happened and came after the end of *the one big wave* of the 2nd industrial revolution in the early 1970s although he is sceptical of a future acceleration and believes that ICT has mostly run its course. Notwithstanding this claim, an obvious factor underpinning American TFP growth is likely to be continuing progress in ICT. A careful review of developments in ICT stresses that semiconductor technology continues to advance rapidly and that (quality-adjusted) prices of microprocessor chips continue to fall steeply such that a baseline projection is that ICT-producing sectors alone will contribute about 0.4 percentage points of TFP growth over the next decade (Byrne et al., 2013). Moreover, since a major result of the ICT revolution will be the ease of analysis of massive amounts of data, there could be a significant acceleration in TFP growth as R & D becomes cheaper and more productive (Mokyr, 2014).



An alternative approach is to project future American TFP growth using a growth model based on endogenous innovation. If the naive models of 25 years ago were invoked, then it might be assumed that TFP growth depended simply on R & D expenditures a share of GDP and since these have not fallen, neither will future TFP growth. Unfortunately, the evidence suggests the

[6] *Growth of the capital stock (and thus the capital-deepening contribution to labour productivity growth) adjusts to TFP growth in this model.*

constant-returns assumption embodied in these models is not valid (Klenow and Rodriguez-Clare, 2005). A more realistic approach may be the semi-endogenous growth model in Jones (2002) in which increases in human capital and in research intensity generate transitory rather than permanent effects on growth. This possibly has the quite pessimistic implication that past TFP growth in the United States has largely come from increases in educational attainment of the population and expansion of the R & D sector which cannot be expected to continue so that future TFP growth may be much slower (Fernald and Jones, 2014). However, even in this model, there may be countervailing tendencies; for example, world research intensity surely still has the scope to rise considerably as new nations, most obviously China, become major players.[7]

On balance, this review does not give strong support to the hypothesis that there will be secular stagnation in the United States based on a dramatic decline in technological progress. This is clearly the view of OECD (2014a), as reported in table 2, which uses a catch-up growth model in which growth in the leading economy (United States) depends on demography and technological progress while long-term TFP growth in (follower) European countries is based on TFP growth in the leader and a component based on reducing the productivity gap with the leader. The OECD projections for European countries in table 2 are based on the assumptions that the crisis significantly reduced the level of potential output in the short term (Ollivaud and Turner, 2014) but has had no adverse effect on long-run trend growth and gradual conditional convergence towards the leading economy depending on institutions and policies.[8] In fact, there is also more scope for catch-up growth in most euro area economies than before the crisis. Real GDP per hour worked for the euro area as a whole as a percentage of the U.S. level has fallen from 88.7 in 1995 to 79.9 in 2007 and 76.0 in 2013.

It is certainly possible to believe that the OECD projections are too optimistic for two main reasons. First, it is striking that this framework leads OECD to expect much better TFP growth in the euro area as a whole and in its troubled economies compared with pre-crisis outcomes. In particular, this will require a much better performance in TFP growth in market services of which there is no sign as yet (van Ark et al., 2013) and which has been the Achilles Heel of the euro area economies in the context of excessive regulation and weak competition (table 3) and which has also retarded the diffusion of ICT (Cette and Lopez, 2012)

[7] *China accounted for 16.2% of world R & D in 2012 compared with 2.3% in 1996 (UNESCO Institute for Statistics, 2014).*

[8] *So the very low growth in Europe of late reflects a levels-effect adjustment resulting from the financial crisis playing out over several years rather than lower long-term trend growth.*

which has been notably slow in some countries (table 3).

Second, the crisis and subsequent weak recovery may well have weakened the political support for market friendly supply-side policies and strengthened forces of populism or even extremism. Across Europe in the 1930s, prolonged stagnation significantly increased the electoral prospects of right-wing extremist parties (de Bromhead et al., 2013) which were not market-friendly. In this context, not only might it be reasonable to worry about recent election results but it should also be recognised that opinion polls show disappointingly low support for the market economy in many countries which have been hit hard by the crisis.[9] It is also well-known that the Great Depression saw big increases in protectionism. Eichengreen and Irwin (2010) showed that, on average, countries which devalued had lower tariffs. They argued that protectionism in the 1930s is best seen as a second-best policy which was used when the conventional macroeconomic tools, fiscal and monetary policy, were unavailable, as they are for euro area economies today. A recent empirical analysis confirms that weak domestic growth and losses in competitiveness continue to be conducive to protectionism (Georgiadis and Gräb, 2013) so it is not surprising that EU Member States have been prominent in imposing such measures according to Global Trade Alert (Evenett, 2014). This does not bode well for the implementation of the Single Market in services which is an obvious antidote to Europe's productivity problem in market services. Nevertheless, prima facie, it seems that with good supply-side policies medium-term growth prospects in the euro area are better than the secular stagnation scenario might seem to suggest.

4 Technological progress and unemployment: Is this the real secular stagnation threat?

The major concern of the original writers on secular stagnation was a future of high and persistent unemployment. This has not been the focal point of current debate but it deserves to be taken seriously. The long hiatus in economic growth in the euro area during the crisis and its aftermath may have significant hysteresis effects and the impact of technological progress may be less benign than was the case during the early postwar decades.

The estimates in table 4 project that in several countries the cumulative output gap by 2016 will be over 30% of GDP. In each of these countries a large fraction of the unemployed are long-term. Past experience suggests that this is a situation in which the employability of those on the margins of the labour force declines and, as a result, the NAIRU increases. IMF (2012) estimates that an additional 1% increase in the cumulative output gap raises the NAIRU by 0.14 percentage points. On this basis, table 4 reports the post-crisis NAIRU will have risen by over 4 percentage points in Greece, Ireland, Italy, Portugal and Spain. Moreover, the likelihood of a "positive shock" similar in magnitude to World War II to negate this hysteresis effect is quite small.

Since about 1980, it appears that the implications of technological progress have become more challenging for the labour market in OECD countries.

[9] *In response to the question "Are people better off in a free market economy?" in 2014 only 47% in Greece, 45% in Spain and 57% in Italy agreed (Pew Research, 2014). In 2007, 67% in Spain and 73% in Italy had agreed (no data for Greece).*

It seems likely that in the ICT era technological progress has become capital-augmenting and the elasticity of substitution between labour and capital has become greater than 1 and this has reduced labour's share of national income by around 5% (Karabarbounis and Neiman, 2014). Job polarization has been a striking feature of employment patterns in advanced economies in the last 30 years or so with the percentages of high-skilled (professional, managerial etc.) and low-skilled (labourers, low-education service sector workers) employment rising while middle-skilled (clerical, blue-collar) employment has been falling. Estimates for an aggregate of 16 European countries show a fall of 9.27 percentage points in the share of their *middling occupations* between 1993 and 2010 against rises for *high-paying* and *low-paying*. This pattern is observed in most countries with 14 of the 16 having experienced a decline in the share of middling occupations (Goos et al., 2014). The model estimated by these authors suggests that this has been almost entirely due to the factor-saving bias of technological change rather than to offshoring with the declining occupations being those which entail tasks which are routine and codifiable and thus are most amenable to computerization (Autor, 2014).

Since the early 1990s, however, there have also been significant developments in the use of robots, a technology which raises labour productivity substantially but also exhibits a strong skill bias, in this case at the expense of the low-skilled. The implication seems to be that, thus far at least, robotics has significantly reduced employment for this category of worker as the substitution of workers by robots has only been partially offset by increased demand for output of robot-intensive production (Graetz and Michaels, 2015). A fall in real price of robots of about 80% led to a big increase in robots per hour worked in OECD manufacturing and added about 0.4% per year to the growth of real GDP per worker.

It seems very likely that the impact of computerisation through robotics will intensify in the near future. Frey and Osborne (2013) estimate that 47% of 2010 employment in the United States has at least a 70% chance of being computerised by 2035 (table 5) with these probabilities being strongly negatively correlated with wages and educational attainment of workers. Tasks which will not be susceptible to computerization are those involving perception and manipulation, creative intelligence, or social intelligence.

If these estimates are correct, the upside is that this technology alone could deliver labour productivity gains equivalent to, say, 1.5% per year over the next 20 years. Future advances will come in machine learning which will be applied in mobile robotics as hitherto non-routine tasks are turned into well-defined problems, in particular using big data which will allow substitution of (much cheaper) robots for labour in a wide range of low-wage service occupations. It seems quite possible therefore that the issue that Europe really confronts is actually not so much slow technological progress but that the skill-bias of new technologies has a big downside in terms of a serious adjustment problem in the labour market.

If we consider the implications of the future computerization of employment as equivalent to a an increase in the dispersion of worker productivities, then in an equilibrium search and matching labour market model, the increase in equilibrium unemployment will be greater in a setting with relatively high unemployment benefit rates and employment protection since these

are labour market policies which increase the convexity of the relationship between the unemployment rate and skill. In a calibrated model, Mortensen and Pissarides (1999) estimate that a common ICT technology shock which would raise unemployment in the United States by about 0.4 percentage points during 1975–1995 would have increased unemployment by 4.8 percentage points with European Union labour market policies.

The data reported in table 6 suggest that many, if not all, European countries are more vulnerable to the technology shocks associated with ICT and robotics than the United States. The symptoms are relatively high proportions of workers with less than upper-secondary education, more generous replacement rates, and higher levels of employment protection. The implication is that the problem foreseen by Hansen (1932), namely, that technological progress might create unemployment because the economy is too inflexible, may actually be a bigger threat to Europe rather than the spectre of the drying up of technological change proposed by Hansen (1939).

5 Fiscal sustainability and secular stagnation

The Keynesian solution to a secular-stagnation unemployment problem was fiscal stimulus using deficit finance, fiscal sustainability permitting. Obviously, this would not be a solution to a problem of high equilibrium unemployment resulting from skill-bias in technological progress which would require a supply-side policy response. It might help, however, to counteract hysteresis.

The fiscal sustainability issue can be considered in two (related) ways. First, in steady state to prevent an increasing public debt to GDP ratio (d) the required primary budget surplus as a share of GDP (b) has to meet the formula $b \geq d(r - g)$ where r is the real rate of interest on government debt and g is the growth rate of real GDP. Second, in the face of an increase in the public debt ratio, the government has to be willing to raise b (Bohn, 1998) by enough to stabilize d. Prima facie, on the basis of the projections in table 7, on at least one and possibly both of these criteria, most European countries have some scope to use this policy approach, especially since, on these OECD projections, real interest rates are below growth rates for several countries. The exceptions, unfortunately, are countries which are among the most exposed to the hysteresis problem such as Greece, Italy and Portugal.

Unfortunately, there is much less fiscal space than this since euro area countries are committed to the *fiscal compact* which requires them to return to a gross government debt ratio no greater than 60% and to eliminate 1/20th of the excess over this level each year. OECD (2013) calculated that to stay within this rule for every year from 2014 to 2023, Greece will have to maintain a primary budget surplus of about 9% of GDP, Italy and Portugal about 6% of GDP, and Ireland and Spain about 3.5% of GDP and most

euro area economies will have to pursue fiscal consolidation. Moreover, if recent trend growth is taken as a guide to future growth rates (table 1), the required primary budget surpluses will be considerably higher and fiscal sustainability may come into question in some countries as the political feasibility of running adequate primary budget surpluses becomes doubtful (Buiter and Rahbari, 2013). Rather than fiscal stimulus being a potential antidote to secular stagnation it seems more likely that secular stagnation will undermine the euro area's fiscal rules.

6 Policy implications

Although Hansen and his followers of 70 years ago thought in terms of stimulating aggregate demand through Keynesian deficit finance, the appropriate response to long-term secular stagnation of whatever type is to improve supply-side policies.

If secular stagnation in the guise of slow growth is a danger, long-run growth prospects can be improved by pro-market reforms that raise future TFP growth and investment as happened through European economic integration from the 1950s through the 1990s (Crafts, 2015b). It is possible to emulate the success of these decades through completion of the Single Market in particular with regard to services where barriers remain high and have not been significantly reduced in recent years (Fournier, 2014). Estimates from a dynamic general equilibrium suggest that the impact could be considerable adding perhaps 1% to the growth rate of large euro area economies over ten years (Aussilloux et al., 2011).[10]

A key focal point of policies to improve productivity growth should be to facilitate the diffusion of technology from the frontier, as the experience of relatively slow adoption of ICT in some European countries in the pre-crisis period underlines. Recent research into the ability of follower countries to capitalize on innovations made by the leader suggests that investments in knowledge-based capital (both managerial and R & D), innovation policies that enhance the absorptive capacity of firms, and a policy framework that supports the efficient reallocation of resources in response to new opportunities are all important in underpinning diffusion (Saia et al., 2015).

In this context, it is important to note that the process of creative destruction clearly works much less well in many European countries than in the United States as is witnessed by processes of entry and exit of firms and the much stronger growth rate of successful American start-ups (Encaoua, 2009). A corollary of this is that, on average, countries in the European Union, especially in Southern Europe, are much inferior to the United States in shifting employment away from less productive towards more productive firms and this may account for as much

[10] *These are, in fact, likely to be significant underestimates of the possible gains because the model does not capture the productivity implications of greater competition.*

as 20 percentage points of the labour productivity gap between the EU and the USA. Barriers to entry and strict employment protection legislation disproportionately reduce the efficiency of labour allocation in high turnover and more innovative sectors (Andrews and Cingano, 2014).

In this context, it would be most unfortunate if in the face of lobbying by vested interests, policymakers' response to new technologies is to try to slow down their diffusion, as the example of Uber might lead us to fear. Rather, if secular stagnation in terms of persistent high unemployment is identified as a major threat, then labour-market reforms will have a central role especially in terms of mitigating the impact of skill-bias in new technologies. The prospect of substantial displacement of low wage labour in the service sector creates a new challenge which is likely to require well-designed active labour market policies together with stricter unemployment benefit rules (Martin, 2014). Given the prospect of a major disruptive new technology, it is important that regulations which impede the reallocation of labour are not strengthened (Haltiwanger et al., 2014).

7 Conclusions

Long-term secular stagnation is generally interpreted these days as very weak trend growth but, in the spirit of Alvin Hansen and his followers, it might better be conceptualised as a problem of high and persistent unemployment. Trend productivity growth appears to have fallen significantly since the turn of the century but future technological change might easily surprise on the upside. If this does transpire, however, it could imply a serious risk of higher unemployment as computerisation leads to job losses in low skilled occupations.

While the Keynesians who pioneered the idea of secular stagnation saw demand – side policies based on fiscal stimulus as the policy response of choice, the right call is to improve supply-side policies in both labour and product markets. Indeed, at present it seems more likely that secular stagnation in terms of slow long-term growth will undermine the euro area's fiscal compact than that fiscal stimulus is a plausible solution to secular stagnation.

Key priorities in supply-side policy include moves to improve labour market flexibility and reduce the vulnerability of Europe to skill-bias in technological progress. This will entail improving the skills of the labour force and also reducing employment protection and unemployment benefits. It would be a Pyrrhic victory to "solve" this potential labour market problem by obstructing the adoption of new technology. To address problems of slow productivity growth a key focal point is to facilitate the diffusion of new technology in particular by increasing investments in knowledge-based capital and by reducing obstacles to creative destruction.

It is far too soon to tell whether secular stagnation is the future for Europe but the risk is surely higher than in the 1930s and 1940s. It does seem clear, however, that European countries generally are much more exposed to risks of secular stagnation than is the United States even though it is the Americans who raised the alarm.

References

Abramovitz, M. and P. A. David. 2001. Two Centuries of American Macroeconomic Growth: from Exploitation of Resource Abundance to Knowledge-Driven Development. Stanford Institute for Economic Policy Research Discussion Paper No. 01-05.

Allsopp, C. and A. Glyn. 1999. The Assessment: Real Interest Rates. In: Oxford Review of Economic Policy 15(2). 1–16.

Andrews, D. and F. Cingano. 2014. Public Policy and Resource Allocation: Evidence from Firms in OECD Countries. Economic Policy 78. 253–296.

Antolin-Diaz, J., T. Drechsel and I. Petrella. 2014. Following the Trend: Tracking GDP when Long-Run Growth is Uncertain. CEPR Discussion Paper No. 10272.

Autor, D. 2014. Polanyi's Paradox and the Shape of Employment Growth. NBER Working Paper No. 20485.

Aussilloux, V., H. Boumellassa, C. Emlinger and L. Fontagne 2011. The Economic Consequences for the UK and the EU of Completing the Single Market. BIS Economics Paper No. 11.

Badinger, H. 2005. Growth Effects of Economic Integration: Evidence from the EU Member States. In: Review of World Economics 141. 50–78.

Bohn, H. 1998. The Behavior of U.S. Public Debt and Deficits. In: Quarterly Journal of Economics. 113. 949–963.

Buiter, W. and E. Rahbari. 2013. Why Do Governments Default and Why Don't They Default More Often? CEPR Discussion Paper No. 9492.

Byrne, D., S. Oliner and D. Sichel. 2013. Is the Information Technology Revolution Over? In: International Productivity Monitor 25. 20–36.

Cette, G. and J. Lopez. 2012. ICT Demand Behaviour: an International Comparison. In: Economics of Innovation and New Technology 21. 397–410.

Cowen, T. 2011. The Great Stagnation. www.digamo.free.fr/cowen11.pdf

Crafts, N. 1987. Long-Term Unemployment in Britain in the 1930s. In. Economic History Review 40. 418–432.

Crafts, N. 2013. Long-Term Growth in Europe: What Difference Does the Crisis Make? In: National Institute Economic Review 224. R14–R28.

Crafts, N. 2015a. Reducing High Public Debt Ratios: Lessons from UK Experience. In: Fiscal Studies Forthcoming.

Crafts, N. 2015b. West European Economic Integration since 1950: Implications for Trade and Income. University of Warwick CAGE Working Paper No. 219.

Crafts, N. and G. Toniolo. 2008. European Economic Growth 1950–2005: An Overview. CEPR Discussion Paper No. 6863.

De Bromhead, A., B. Eichengreen and K. H. O'Rourke. 2013. Political Extremism in the 1920s and 1930s: Do German Lessons Generalize? In: Journal of Economic History 73. 371–406.

Domar, E. D. 1944. The 'Burden of the Debt' and the National Income. In: American Economic. Review 34. 798–827.

Eichengreen, B. and D. Irwin. 2010. The Slide to Protectionism in the Great Depression: Who Succumbed and Why? In: Journal of Economic History 70. 871–897.

Encaoua, D. 2009. Nature of the European Technology Gap: Creative Destruction or Industrial Policy? In: Foray D.(ed.) The New Economics of Technology Policy. Cheltenham: Edward Elgar. 281–314.

Evenett, S. J. 2014. The Global Trade Disorder. London: CEPR Press.

Fernald, J. G. 2014. Productivity and Potential Output before, during and after the Great Recession. NBER Working Paper No. 20248.

Fernald, J. G. and C. I. Jones. 2014. The Future of US Economic Growth In: American Economic Review Papers and Proceedings 104. 44–49.

Field, A. J. 2011. A Great Leap Forward: 1930s Depression and U.S. Economic Growth. New Haven: Yale University Press.

Fournier, J-M. 2014. Reinvigorating the EU Single Market. OECD Economics Department No. 1159.

Frey, C. B. and M. A. Osborne. 2013. The Future of Employment: How Susceptible are Jobs to Computerisation? Mimeo. Oxford Martin School.

Georgiadis, G. and J. Gräb. 2013. Growth, Real Exchange Rates and Trade Protectionism since the Financial Crisis. ECB Central Bank Working Paper No. 1618.

Ghosh, A. R., J. I. Kim, E. G. Mendoza, J. Ostry and M. S. Qureshi. 2013. Fiscal Fatigue, Fiscal Space and Debt Sustainability in Advanced Economies. In: Economic Journal 123. F4-F30.

Goldin, C. and L. F. Katz. 2008. The Race between Education and Technology. Cambridge. Mass. Belknap Press.

Goos, M., A. Manning and A. Salomons. 2014. Explaining Job Polarization: Routine-Biased Technological Change and Offshoring. In: American Economic Review 104. 2509–2526.

Gordon, R. J. 1997. The Time-Varying NAIRU and its Implications for Policy. In: Journal of Economic Perspectives 11(1). 11–32.

Gordon, R. J. 2000. Interpreting the 'One Big Wave' in U.S. Long-Term Productivity Growth. In: van Ark, B., S. K. Kuipers and G. H. Kuper (eds.). Productivity, Technology and Economic Growth. Dordrecht: Kluwer Academic Publishers. 19–65.

Gordon, R. J. 2014. The Demise of U. S. Economic Growth: Restatement, Rebuttal, and Reflections. NBER Working Paper 19895.

Graetz, G. and G. Michaels. 2015. Robots at Work. CEPR Discussion Paper No. 10477.

Haltiwanger, J., Scarpetta, S. and H. Schweiger. 2014. Cross-Country Differences in Job Reallocation: the Role of Industry, Firm Size and Regulations. In: Labour Economics 26. 11–25.

Hansen, A. H. 1932. The Theory of Technological Progress and the Dislocation of Employment. In: American Economic Review Papers and Proceedings 22. 25–31.

Hansen, A. H. 1939. Economic Progress and Declining Population Growth. In: American Economic Review 29. 1–15.

Hansen, A. H. 1941. Fiscal Policy and Business Cycles. London: Routledge.

Hansen, A. H. 1951. Business Cycles and National Income. New York: Norton.

Harrod, R. F. 1948. Towards a Dynamic Economics. London: Macmillan.

Havik, K., K. McMorrow, F. Orlandi, C. Planas, R. Raciborski, W. Röger, A. Rossi, A. Thum-Thysen and V. Vandermeulen. 2014. The Production Function Methodology for Calculating Potential Growth Rates and Output Gaps. European Economy Economic Papers No. 535.

Higgins, B. 1950. The Theory of Increasing Under-Employment. In: Economic Journal 60. 255–274.

IMF. 2012. Article IV Report: United Kingdom.

IMF. 2013. Historical Public Finance Database.

IMF. 2015. Fiscal Monitor.

Jones, C. I. 2002. Sources of U. S. Economic Growth in a World of Ideas. In: American Economic Review 92. 220–239.

Karabarbounis, L. and B. Neiman. 2014. The Global Decline of the Labor Share. In: Quarterly Journal of Economics 129. 61–103.

Katz, L. F. and R. A. Margo 2013. Technical Change and the Relative Demand for Skilled Labor: the United States in Historical Perspective. NBER Working Paper No. 18752.

Klenow, P. J. and A. Rodriguez-Clare. 2005. Externalities and Growth. In: Aghion, P. and S. N. Durlauf (eds.). Handbook of Economic Growth vol. 1A. Amsterdam: Elsevier. 817–861.

Klump, R., McAdam, P. and A. Willman. 2007. Factor Substitution and Factor-Augmenting Technological Progress in the United States: a Normalized Supply-Side System Approach. In: Review of Economics and Statistics 89. 183–192.

Krugman, P. 2014. Four Observations on Secular Stagnation. In: Teulings, C. and R. Baldwin (eds.). Secular Stagnation: Facts, Causes and Cures. London: CEPR Press. 61–68.

Martin, J. P. 2014. Activation and Active Labour Market Policies in OECD Countries: Stylized Facts and Evidence on their Effectiveness. IZA Policy Paper No. 84.

Mathy, G. P. 2015. Hysteresis and Persistent Long-Term Unemployment: Lessons from the Great. Depression and World War 2. American University Department of Economics Working Paper. 2015-02.

Matthews, R. C. O. 1968. Why has Britain had Full Employment since the War? In: Economic Journal 78. 555–569.

Mortensen, D. T. and C. A. Pissarides. 1999. Unemployment Responses to 'Skill-Biased' Technology Shocks: the Role of Labour Market Policy. In: Economic Journal 109. 242–265.

Mokyr, J. 2014. Secular Stagnation? Not in Your Life. In: C. Teulings and R. Baldwin (eds.). Secular Stagnation: Facts, Causes and Cures. London: CEPR Press. 83–89.

OECD. 2013. Economic Outlook.

OECD. 2014a. Economic Outlook.

OECD. 2014b. Education at a Glance.

OECD. 2015. Economic Outlook.

Ollivaud, P. and D. Turner. 2014. The Effect of the Financial Crisis on OECD Potential Output. OECD Economics Department Working Paper No. 1166.

Pew Research. 2014. Pew Global Attitudes Project. www.pewglobal.org

Saia, A., D. Andrews and S. Albrizio. 2015. Productivity Spillovers from the Global Frontier and Public Policy: Industry Level Evidence. OECD Economics Department Working Paper 1238

Samuelson, P. A. 1970. Economics 8th Edition. New York: McGraw-Hill.

Summers, L. 2014. U.S. Economic Prospects: Secular Stagnation, Hysteresis, and the Zero Lower Bound. In: Business Economics 49(2). 65–73.

Teulings, C. and R. Baldwin (eds.). 2014. Secular Stagnation: Facts, Causes and Cures. London: CEPR Press.

UNESCO Institute for Statistics. 2014. Research and Experimental Development Database. www.data.uis.unesco.org.

Van Ark, B. 2011. Up the Hill and Down Again: a History of Europe's Productivity Gap Relative to the United States,1950–2009. In: Nordic Economic Policy Review. 27–56.

van Ark, B. Chen, V. and K. Jäger. 2013. European Productivity Growth since 2000 and Future Prospects. In: International Productivity Monitor 25. 65–83.

Table 1

Growth of potential output and its sources

	Real GDP	Hours worked	GDP/hour worked	TFP
	% per year			
1995–2007				
EA-12	2.0	0.6	1.4	0.8
EU-15	2.2	0.6	1.6	1.0
USA	3.0	0.8	2.2	1.4
2014–2023				
EA-12	1.1	0.3	0.8	0.5
EU-15	1.1	0.3	0.8	0.5
USA	2.4	0.9	1.5	1.0

Source: Derived from Havik et al. (2014).

Table 2

OECD future growth projections 2014–2030

	Real GDP	Employ-ment	GDP/ worker	TFP
	% per year			
United States	2.4	0.5	1.9	1.6
Euro area	1.7	0.2	1.5	1.2
Austria	1.9	0.2	1.7	1.5
Belgium	2.0	0.4	1.6	1.1
Denmark	1.6	0.1	1.5	1.0
Finland	2.0	–0.1	2.1	1.9
France	2.2	0.3	1.9	1.2
Germany	1.1	–0.5	1.6	1.5
Greece	2.2	0.2	2.0	1.8
Ireland	2.3	1.2	1.1	0.8
Italy	1.5	0.3	1.2	0.7
Netherlands	2.1	0.2	1.9	1.6
Portugal	1.4	0.3	1.1	0.9
Spain	1.5	0.9	0.6	0.4
Sweden	2.6	0.5	2.1	1.8
UK	2.6	0.6	2.0	1.5

Source: OECD (2014a).

Table 3

Aspects of labour productivity growth in the market sector, 1995–2007

a) Growth accounting

	Labour Quality	Non ICT K/HW	ICT K/HW	TFP	Y/HW
	% per year				
Austria	0.1	0.0	0.5	1.5	2.2
Belgium	0.2	0.4	0.9	0.1	1.7
Denmark	0.1	0.1	1.0	–0.1	1.0
Finland	0.1	–0.1	0.5	2.8	3.3
France	0.3	0.4	0.3	0.9	2.0
Germany	0.0	0.5	0.5	0.7	1.7
Italy	0.1	0.4	0.2	–0.4	0.4
Netherlands	0.4	0.0	0.5	1.1	2.1
Spain	0.4	0.5	0.4	–0.6	0.6
United Kingdom	0.4	0.4	0.8	1.0	2.6
EU-10	0.2	0.4	0.5	0.6	1.6
USA	0.3	0.3	0.9	1.2	2.6

b) Sectoral contributions

	ICT produc-tion	Goods produc-tion	Market services	Real-location	Y/HW
	% per year				
Austria	0.3	1.7	0.2	–0.1	2.2
Belgium	0.3	0.9	0.6	–0.1	1.7
Denmark	0.3	0.4	0.4	–0.1	1.0
Finland	1.7	1.3	0.5	–0.1	3.3
France	0.4	0.8	0.7	0.0	2.0
Germany	0.5	0.9	0.4	0.0	1.7
Italy	0.2	0.2	0.0	–0.1	0.4
Netherlands	0.4	0.6	1.2	–0.2	2.1
Spain	0.1	0.2	0.3	–0.1	0.6
United Kingdom	0.5	0.7	1.6	–0.2	2.6
EU–10	0.4	0.7	0.6	–0.2	1.6
USA	0.8	0.3	1.8	–0.2	2.6

Source: van Ark (2011).

Table 4

Estimates of hysteresis effect of crisis on NAIRU

	Cumulative output gap , 2009–2016	Predicted change in NAIRU
	% of GDP	*Percentage points*
Austria	9.4	1.32
Belgium	6.0	0.84
Denmark	14.9	2.09
Finland	15.5	2.17
France	13.1	1.83
Germany	9.5	1.33
Greece	63.7	8.92
Ireland	37.7	5.28
Italy	34.4	4.82
Netherlands	8.7	1.22
Portugal	32.1	4.49
Spain	32.9	4.61
Sweden	14.2	1.99
UK	13.4	1.88
Euro area	18.7	2.62
USA	25.1	3.51

Source: Author's calculations.

Note: Change in NAIRU estimated based on cumulative output gap from OECD (2015) using method in IMF (2012).

Table 5

Estimates of computerisation probabilities by 2035

	% of 2010 employment in USA
≤ 0.3	33
>0.3 but < 0.7	19
≥ 0.7	47

Source: Frey and Osborne (2013).

Table 6

Exposure to skill-bias of technological change

	Low educational attainment	Unemployment rate of low educated	Employment protection	Net replacement rate
	% of labour force	*%*	*0–6*	*%*
Austria	17	7.7	2.37	72
Belgium	28	12.1	1.81	82
Denmark	22	9.6	2.20	87
Finland	16	11.6	2.17	69
France	28	13.8	2.38	68
Germany	13	12.8	2.87	83
Greece	32	25.3	2.12	46
Ireland	25	23.3	1.40	75
Italy	43	12.2	2.51	78
Netherlands	27	6.6	2.82	81
Portugal	63	16.0	3.18	78
Spain	46	31.2	2.05	74
Sweden	13	12.3	2.61	67
UK	22	10.5	1.03	56
USA	11	14.3	0.26	51

Source: OECD (2014b), OECD Benefits and Wages database and OECD Employment Protection database.

Notes: Low educational attainment is defined as less than upper secondary for ages 25–64 in 2012; employment protection is for permanent workers in 2013; net replacement rate is for household with 1 earner and 2 children on 67% average wage at initial unemployment in 2013.

Table 7

Aspects of future fiscal sustainability

	2014 d	2020 r	2030 r	2014–2030 g	Max b	Limit of d
Austria	0.868	1.2	1.8	1.9	2.0	1.873
Belgium	1.056	1.4	1.8	2.0	6.3	1.684
Denmark	0.426	1.1	1.8	1.6	9.2	2.087
Finland	0.596	1.4	2.2	2.0	6.5	1.845
France	0.951	2.2	2.3	2.2	1.0	1.761
Germany	0.731	1.0	1.8	1.1	1.6	1.758
Greece	1.772	6.9	3.2	2.2	3.9	<1.586
Ireland	1.095	3.1	1.8	2.3	5.4	1.497
Italy	1.321	3.1	2.3	1.5	5.3	<1.247
Netherlands	0.683	1.4	1.8	2.1	4.2	1.901
Portugal	1.302	5.4	2.4	1.4	2.4	<0.984
Spain	0.977	4.2	2.0	1.5	2.9	1.539
Sweden	0.415	2.3	2.6	2.6	5.0	2.049
UK	0.895	3.7	3.7	2.6	3.5	1.665

Sources:
2013 d is public debt to GDP ratio in 2013 (IMF, 2015).
2020 r and 2030 r are projected real interest rates on 10-year government bonds in 2020 and 2030, respectively (OECD, 2014a).
2014–2030 g is the projected average rate of growth of real GDP between 2014 and 2030 (OECD, 2014a).
Max b is the largest average primary budget surplus as a percentage of GDP over a 5-year period since 1980 (IMF, 2013).
Limit of d is the projected public debt to GDP ratio at which past experience indicates that the response of the primary surplus would no longer satisfy a fiscal-sustainability criterion (Ghosh et al., 2013).

Carl Christian von Weizsäcker[1]
Senior Research Fellow
Max-Planck-Institute on Collective Goods, Bonn

[1] *weizsaecker@coll.mpg.de.*

How to avoid secular stagnation

In this lecture, I deal with the causes and consequences of a relatively recent characteristic of the world economy: the end of capital scarcity. Let me add at the very beginning: I believe this is a phenomenon that is here to stay – unless we should experience another world war which might destroy a lot of real capital.

Here in Vienna let us start with the father of capital theory: Eugen von Böhm-Bawerk. Böhm-Bawerk's theory basically explained the positive real rate of interest by pointing to the scarcity of capital. For Böhm-Bawerk and for us today (and similar to other prices in the economy) the real rate of interest is an indicator of the scarcity of the good for which the rate of interest is the price: real capital. Böhm-Bawerk presented an elaborate argument why capital was scarce and why therefore one needed a positive rate of interest as a rationing device for the use of capital.

It is my proposition that today capital is no longer scarce and that therefore – in the very spirit of Böhm-Bawerk's *opus magnum* the price for capital, i.e. the "natural rate of interest", as Wicksell then designated it, is no longer positive.

Let me be more precise: Böhm-Bawerk and Wicksell had an economy in mind in which the fiscal demand for loans and the fiscal supply of loans was zero. In that hypothetical model world public debt was zero. Only under this assumption did it make sense for Böhm-Bawerk to derive a positive rate of interest from the prevailing scarcity of capital. Thus, following the tradition of capital theory, I also look at the hypothetical situation of capital market equilibrium in an economy with zero net public debt. Obviously, a sufficiently high public indebtedness "crowds out" private investments with a positive rate of return on investment. I come back to this point below.

These days people talk about the reappearance of "secular stagnation". The "end of capital scarcity" can be linked to the fear of secular stagnation. Or to the talk about the "savings glut". My specific angle of analysis to this general discussion is derived from my belief that it is precisely the "Austrian capital theory" which enables us to derive a theoretical underpinning for the hypothesis of the savings glut or the hypothesis of secular stagnation.

1 Demand for capital: There is no upward trend in the capital output ratio

Böhm-Bawerk developed the theory of the productivity advantages of a greater roundaboutness of production. The latter, according to Böhm-Bawerk, is measured by the average period of production. According to him the rate of interest was the price signal for the marginal percentage gain in labour productivity due to a small rise in the period of production. Also, following Böhm-Bawerk, the amount of capital tied to the production process per unit of final output is determined by the average period of production. In essence,

despite the many criticisms of his theory, modern capital theory can show that Böhm-Bawerk's intuition is correct.[2] Indeed, under conditions of steady state growth of an economy one can show that the period of production equals the value ratio between the capital tied down in production and the annual consumption level in this economy. The latter ratio, I designate as the

"capital-output ratio". Traditionally, the capital output ratio is defined as the stock of capital over the flow of annual net national income. The difference between the two magnitudes is not very large in practice. And using the flow of consumption in the denominator enables us to define equilibrium in the capital market by the equality of that capital-output ratio and a corresponding ratio on the supply side of capital.

As we now look at the long range development of the capital output ratio in OECD countries we observe that in the 20th century and the 15 years of the 21st century this ratio did not rise on average. There is no upward trend in the capital output ratio. And this is so despite the fact that financing conditions of real investments have substantially improved in these last 115 years. Just a few examples:

- A much larger fraction of society is able to obtain real estate loans for the purchase of a house or a flat than was the case a century ago.
- The typical price earnings ratios on modern stock markets are much larger than they were a century ago.
- Obtaining equipment like cars or other standardized machinery by means of leasing contracts is much easier today than it was before World War I.
- Real interest rates to be paid by borrowers tend to be lower now than they were, say, in the year 1900.

For later reference, I also mention that the capital output ratio in China is not higher than it is in the representative OECD country.

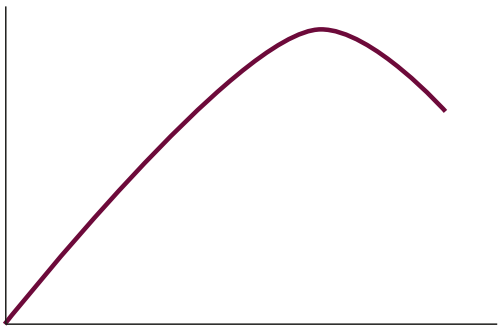
As far as I could find out there is not a single country in the OECD plus China area in which the capital output ratio exceeds six years.

My explanation is this: there is a limit to Böhm-Bawerk's law of greater productivity of greater roundaboutness. Greater roundaboutness of production means a greater degree of com-

Chart 1

The (modernised) Böhm-Bawerk law of greater productivity of greater roundaboutness of production

Labour productivity



T = period of production = capital-consumption ratio

Source: Author's illustration.

[2] *On this Weizsäcker (2014).*

plexity of the social production process. No doubt, there are productivity advantages of complexity. For example, as Adam Smith already observed, the division of labour enables a society to obtain higher productivity by orders magnitude. But there are limits for the socially advantageous division of labour. Overspecialization is a well-known phenomenon which is detrimental to productivity. Similarly, from a certain point onwards greater roundaboutness of production no longer generates incremental productivity advantages.[3]

Net of risk premiums and after tax effects real interest rates have been close to zero or below zero for an extended period of time. This is an indication that we have come close to the point of roundaboutness of production which maximises labour productivity. We simply have to follow the Böhm-Bawerkian idea that the rate of interest is a price signal for the marginal productivity of greater roundaboutness.

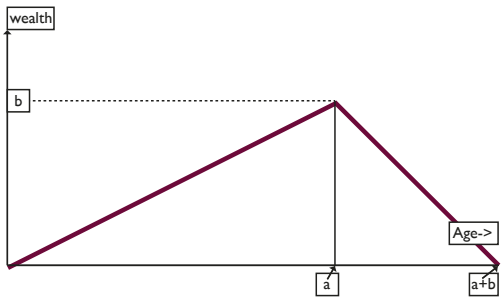
2 The rising supply of capital: The savings triangle, an eye-opener

In the OECD countries and in China people, on average, enter the labour force at the age of twenty and leave the labour force for retirement at the age of sixty. Their adult life, on average, extends from the age of twenty to the age of eighty. Their retirement life, on average, lasts twenty years: from age sixty to age eighty.

Here, I introduce an analytical device for thinking about the supply of capital in terms of these demographic facts. It is in the spirit of Modigliani's life cycle hypothesis.[4] I call it the "savings triangle". Imagine a person earning a constant level of annual wages for a years, and then expecting to live in retirement for another b years. Ignore interest payments on accumulated wealth. The person wants to distribute her consumption flow evenly across time. We then can draw a picture showing the level of accumulated wealth throughout the life of the person. The total length of the adult life then is $a+b$. Wealth is zero at the beginning of adult life and at its end. In between, it rises linearly for a periods and reaches its maximum at the time of retirement. From then onwards wealth declines linearly until it reaches zero at the end of life. Here, we ignore interest payments on wealth. At its maximum wealth equals the total amount of consumption during the retirement period. The maximum wealth then amounts to b times annual consumption. In chart 2 we draw the "savings triangle". We depict wealth of the person as a function of age, beginning with the biological age 20, which is age zero of adult life. The unit in which we measure wealth is the level of annual consumption. Thus, wealth is measured in time units: so and so many years of annual consumption.

Chart 2

The savings triangle



Source: Author's illustration.

[3] *A more detailed analysis of the limits for socially advantageous roundaboutness of production is contained in Weizsäcker (2015), especially sections 3 and 5.*

[4] *Modigliani et al. (1954).*

This triangle helps us to assess the wealth the person has on average through her adult lifetime. Obviously it is $\frac{b}{2}$ years of consumption. For a stationary population this average wealth through time of one cohort corresponds to the average wealth per head of the total population at a given time. Thus in this stylized economy the wealth/consumption ratio equals $\frac{b}{2}$ years. Given that for the OECD and China the retirement period equals 20 years we infer a wealth/consumption ratio of 10 years.

At first sight the simple model seems to be a rather unrealistic description of the representative consumer and saver. But it is not that unrealistic if we reckon in present value terms. Then, as long as the rate of interest obtained on accumulated wealth equals the rate of growth of annual wages and the rate of growth of annual consumption we are back at our triangle. We simply have to reckon in present value terms.

The savings triangle model leads to a savings ratio out of labour income of one third. The people in the labour force save half as much as they consume because the pension period is half their working period. Their labour income is spread over 40 years, their consumption spreads over 60 years. Hence, one third of their wage income is spent in years in which they do not work, i.e. it is saved for retirement consumption.

And this is to a close approximation what we observe in actual advanced economies with a well-developed social security system. If we add together private savings in the narrow sense of that word, contributions of employees, employers and the government towards the financing of pensions, if we add contributions of the active population to the financing of health costs of pensioners then we arrive at roughly one third of wage income. These are, in a sense, quasi-savings of the active population, because their contributions to the financing of the pensioners are justified by the promise that they later will receive similar social security and health benefits when they are old.

For a more detailed analysis of life cycle savings in this context see Weizsäcker (2014) and Weizsäcker (2015).

On top of saving for retirement there is saving for bequests, in particular for children's inheritance. My estimate for the advanced economies, but also for China, is that the wealth effect of this bequest motive amounts to at least another two years of consumption. Thus, on average people in the OECD plus China region want to hold wealth amounting to at least 12 years of consumption.

This propensity to hold wealth is at least double the amount of real capital which is required for the roundaboutness of production under a zero real rate of interest. I therefore conclude that the natural rate of interest is negative. This means: If it were not for a substantial level of government debt, an excess of saving over investment only could be avoided with a substantially negative real rate of interest.

And indeed, government debt in OECD countries amounts to at least three years of consumption. There is the explicit public debt, which on average over the different OECD members amounts to about one year of consumption. On top of this comes the much larger implicit debt generated by pay-as-you-go social security systems: The government has an obligation to honour the future pension rights of people who have already contributed to the social security system. At least one quarter of wealth held by people is directly and in-

directly held in the form of explicit and implicit public debt.

From the point of view of theory, in particular Austrian theory, it is of some interest that the capital market equilibrium is characterised by the equality of the period of production and the "waiting period". The former stands, as discussed above, for the demand for real capital. The latter stands for the supply of capital. As an example, I use again the savings triangle where I derived that the average wealth per person amounts to $\frac{b}{2}$ times annual consumption. Let me then define the "waiting period" as the average delay of consumption relative to the time the income was earned. The "time point of gravity" of earnings is the middle between age 20 and age 60, i.e. it corresponds to age 40. The "time point of gravity" of consumption is the middle between age 20 and age 80, i.e. it corresponds to age 50. The difference between these two points of gravity can be interpreted as the average "waiting period" between earning and consuming the money. It is not an accident that this waiting period equals the average amount of wealth held by the person throughout her life, if we reckon in the accounting unit "annual consumption". Indeed, it can be shown quite generally that this equality of the waiting period and the period of production is a characteristic of capital market equilibrium of an economy which exhibits steady state growth and which has no public debt.[5] A special case is the stationary economy which corresponds to a growth rate of zero.

Why is it that many economists and many people in business and politics resist the insight of a negative natural rate of interest? One reason, in my opinion, is the fact that this negative natural rate of interest is a recent phenomenon. And the very low interest rates are also a new experience. Many analysts believe the rate of interest is so low because the leading central banks make it artificially low. The problem is that – as Wicksell already taught us – a central bank which keeps interest rates artificially low, will experience substantial inflation fairly soon. But neither Japan nor Switzerland have experienced inflation despite the fact that in both countries interest rates have been very low for a long time. The deeper

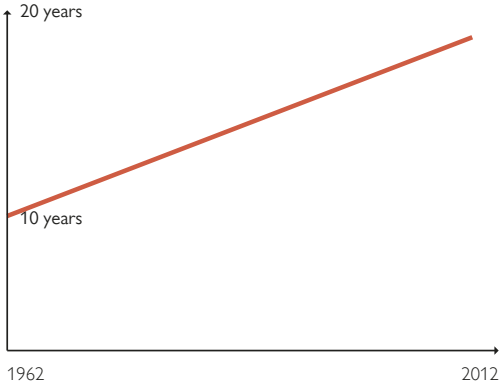
reason for resistance against the negative natural interest proposition can be seen in the fact that it is a novel experience of humankind. When Böhm-Bawerk developed his scarcity theory of the positive real rate of interest the average pension period in the developed world was less than two years. Saving for retirement was less important than now by an order of magnitude. Böhm-Bawerk's reasons given for an insufficient saving activity were indeed more important than the provision for retirement. But life expectancy has steadily risen in the last hundred years. As chart 3 shows for the case of Germany, within the last half century

[5] *Cf. Weizsäcker (2014).*

Chart 3

Average retirement life in Germany

Average retirement life in Germany, i.e. "b" for Germany



Source: Author's illustration.

the *b* has doubled from 10 years to 20 years.

Moreover, through large parts of that period government debt has risen faster than GDP or annual consumption – and this mainly for reasons which were not of a "Keynesian" nature of insufficient demand. This has kept the real interest rate substantially above its "natural" level – thereby deflecting attention from the steady decline in this natural rate of interest. Only in the 1990s the rapid rise of Chinas role as a net exporter not only of goods, but also of capital lead to the idea of a saving glut. And then only the financial crisis from 2007 onwards lead a small, but growing minority of commentators towards the conclusion that something fundamental and lasting may have changed in the world capitalist system.

If the natural rate of interest remains permanently negative this will have substantial implications for the appropriate institutional set-up of the capitalist world. This is likely to be inconvenient for many vested interests tied up with the prevailing institutions. Thus, it is understandable that there is strong resistance against this new economic thinking. And let us not forget the final passage of Keynes' General Theory, from which I quote:[6] "the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. Indeed, the world is ruled by little else. Practical men, who believe themselves to be quite exempt from any intellectual influences, are usually the slaves of some defunct economist. Madmen in authority, who hear voices in the air, are distilling their frenzy from some academic scribbler a few years back. I am sure the power of vested interests is vastly exaggerated compared with the gradual encroachment of ideas. Not, indeed, immediately, but after a certain interval; for in the field of economic and political philosophy there are not many who are influenced by new theories after they are twenty-five or thirty years of age, so that the ideas which civil servants and politicians and even agitators apply to current events are not likely to be the newest. But, soon or late, it is ideas, not vested interests, which are dangerous for good or evil."

3 Some policy implications

In the following, I discuss a few policy topics which one can derive from the negative natural interest phenomenon. Obviously, many more implications wait in the wings.

We must distinguish between the "natural real rate of interest" and the "equilibrium real rate of interest". The former is the equilibrium rate of interest which would prevail in a world economy with zero public debt. Let me denote it by $r*$. The actual equilibrium real rate of interest is influenced by the actual fiscal behaviour of the different

[6] *Keynes (1936).*

states in the OECD plus China region. I denote it by *r*.

Given that we observe a very low level of interest rates I work with the following hypothesis. Let *D* be the "public debt period". By this I mean the ratio between total public debt in the OECD plus China region and the annual flow of consumption in the same region. The hypothesis then is: provided *D* does not rise in the future, the equilibrium real rate of interest will stay at zero or below zero. As before, the real rate of interest *r* is understood net of risk premiums and after tax effects. Thus, *r* is the real rate a government pays in effect on its debt, if the capital market considers it to be free of default risk. Take German "Bunds" of 10-years remaining duration as an example. Its yield these days is 0.6% p.a. Given that the tax payer pays 30% tax on this interest payment the government in effect pays 0.42% p.a. With an inflation rate of 1% p.a. the real rate is –0.58%, i.e. it is negative.

3.1 The "zero-interest fiscal dividend"

If an economy grows at the annual rate $g > 0$ then public debt can rise every year at the rate *g* without changing the public debt period *D*. At an interest rate $r = 0$ and keeping government expenditures the same, and looking at steady state growth, taxes as a proportion of annual consumption can be lower by *gD* if compared with a government debt of zero. I call this gain for the tax payer the "zero-interest fiscal dividend". This fiscal dividend would be even larger, if the real rate of interest was negative. The zero-interest fiscal dividend is of course a special case of the well-known Domar formula for the steady state requirement of the primary budget surplus. In this case the steady state requirement of the primary budget surplus is $-gD$, if expressed in annual consumption units.[7]

There is an additional "secondary zero-interest fiscal dividend". It is due to the reduction in tax-induced allocation distortions. It is of course well known that taxes distort the price signals of a market economy, and thus they distort the allocation of scarce resources. It is of course difficult to assess the size of the allocation distortion due to taxation. But we know that it is not insubstantial. Moreover, we know that it rises progressively with the level of taxation. Thus, if the burden of distortive taxation can be reduced from, say, 30% (of annual consumption) in the case without public debt to, say, 24%

with $D = 3$ *years of consumption* and $g = 2\%$ *p. a.* then the burden of distortive taxation is reduced by more than one fifth.

If, for example, the tax-induced allocation distortion rises with the square of the level of distortive taxation, if moreover the total loss due to tax-induced allocation distortion amounts to

[7] *On the Domar formula consider Holtfrerich et al. (2015), 36–42.*

15% of consumption in the case of a 30% tax burden then the reduction of this tax burden to 24% (due to the zero-interest fiscal dividend) amounts to a reduction of the tax-induced allocation distortion loss from 15% to $\frac{16}{25}15\% = 9.6\%$. This would be a "secondary zero-interest fiscal dividend" of 5.4% of the level of consumption. The total – primary and secondary – zero-interest fiscal dividend would in that numerical example amount to 11.4% of consumption.

Obviously, the zero-interest fiscal dividend cannot be raised at will by raising the public debt period *D*. The latter can only be raised subject to the constraint that the standing of the debtor in the capital market is not negatively affected.

3.2 Private savings invested at home or invested abroad?

For a decade now Germany has an export surplus which approximately equals the savings (in the conventional definition, thus excluding social security contributions) of private households. Net investment in Germany is lower than aggregate savings by an amount which roughly corresponds to private household savings. Firms exhibit an excess of retained earnings over their net investments which enables them to finance the government deficit.

For the German economy the returns on capital invested abroad are dismally negative. A large fraction went into securities which later defaulted. A number of large banks had to be rescued by the government. Several of them were liquidated.

In the following, I give several reasons why Germany under these circumstances should incur substantial public debt, be it by reducing taxes, be it by raising public investment.

One reason for such a policy is the implicit German guarantee against a collapse of the euro. By raising effective domestic demand in Germany other members of the euro area can raise their exports into Germany and can reduce their imports from Germany. This helps them in their attempt to remain solvent and to convince the capital market that their public debt is not a risky asset. Thus, other things equal, the risk premiums on French, Italian, Spanish public debt declines. These countries pay lower interest rates on their debt, and the likelihood that the German taxpayer has to rescue the public finances in the euro area declines. In a sense, greater explicit public debt of Germany reduces the hidden or implicit public debt of Germany – and this perhaps at a rate so that full (explicit plus implicit) public debt does not even rise in Germany.

Quite generally, in the international context there is an "Invisible Hand Theorem on Public Debt". One half of it is well known in traditional neoclassical economics. If the rate of interest is high on the international capital market, it is to its domestic advantage when a country reduces its public debt or at least reduces its government deficits. At the same time it thereby contributes to a reduction of the interest rates other

countries pay which is to their advantage. But the mirror image of this proposition is also correct: If interest rates are below the rate of growth of a given country then it is in the interest of that country to raise the government deficit and thereby to raise the debt period *D*. But thereby it also tends to raise its imports and to reduce its exports which in a world of low interest rates is beneficial for the other countries. Generally, we can say that high interest rates signify a "quasi-Barrovian" world.[8] There deficit spending is not advisable. On the other hand low interest rates signify a "quasi-Keynesian" world in which deficit spending is advisable. Since the risk-free rate of interest is a common variable of the international system the invisible hand theorem on public debt prevails. In the "quasi-Barrovian" world debt reduction is advisable for all countries and the benefits of such deficit reduction spread over all countries. In the "quasi-Keynesian" world deficit spending is advisable and the benefits of such deficit spending spread over all countries.

3.3 More growth for Germany due to deficit spending

If demand for goods and services goes up in Germany, and given zero interest rates, so will supply. As at this time skilled labour is a shortage, additional immigration due to good economic conditions should enlarge the skilled labour force. At the same time, if government and private spending goes up due to greater government deficits private investment will also rise, be it in the commercial sector, be it in housing. All this will contribute to economic growth.

No doubt, higher German government deficits can have an inflationary effect in Germany. But at this time higher German inflation contributes to a speedier adjustment of relative prices within the euro area. As the trade balances of the euro members indicate, prices and wages in some of the Mediterranean countries are "too high", whereas they are "too low" in Germany. Correction of these relative prices is quite painful if it occurs only by deflation, as it does these days. This cumbersome correction process could be made shorter and less costly, if there were some more inflation in the prospering northern member states of the euro area.

Indeed, the ECB is committed to the goal of price stability. It cannot be reached, if the adjustment of relative prices only occurs via deflation and not also partly by inflation.

But note that even with some inflation the growth effect and hence aggregate welfare effect of greater public debt is positive for Germany – given that interest on public debt is zero.

3.4 Demography and public debt

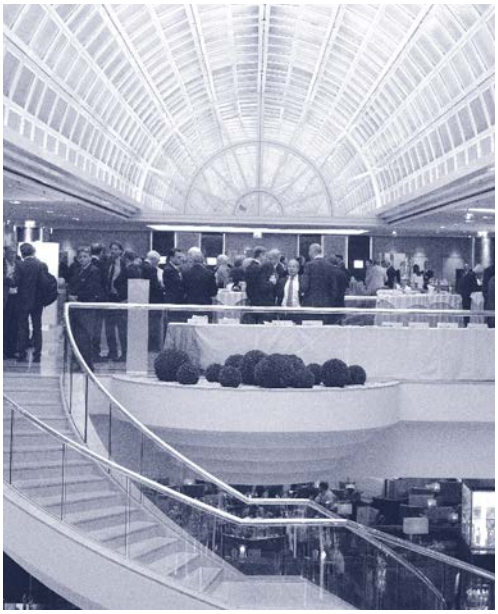
Traditional theory tends to justify the substantial German net capital export as an anticipation of a worsening demographic situation due to low birth rates in Germany. For these future times of a society with many pensioners and an insufficient number of people in the labour force one hopes to draw on the wealth which has been accumulated abroad. In other words, one then expects a negative German balance of trade which one can afford due to the high asset ownership outside of Germany.

Is this the best policy for Germany? I doubt it. As long as due to the savings glut the return on capital invested abroad is nil or very low there are

[8] *Cf. Barro 1974. Note that the Ricardo-Barro Theorem only applies in a world with* $>g$.

greater returns on domestic public investments which can be financed by incurring public debt. There are obvious deficiencies in the German public infrastructure. They could be removed by debt financed investment in roads, bridges, railway tracks etc.

But beyond that I want to point to the following link between public debt



and demography. In recent work by the Max-Planck-Institute for Demography in Rostock demographers made fertility forecasts based on an international cross-section analysis referring to countries with high living standards.[9] It turns out that within a group of countries with similar standards of living fertility is markedly higher in countries in which gender equality is high than in other countries. I do not go here into a detailed explanation of this finding. We may surmise that in countries where they have a good social standing in society, women do not have to fear substantial career losses when they give birth to children. The "price" of having children then is lower than in countries were women still have to struggle to find their adequate socio-economic position outside of the family.

In economically advanced countries there are of course ways to spend government money to raise gender equality. One way is to build up facilities like pre-school institutions for small children that help mothers to cope with the dual task of raising children and working in a paid job. Other such forms of encouraging gender equality may also require government money. If the rate of interest is zero for government debt then one of the best investments for the future well-being of the country and its people could be such government expenditure that indirectly leads to higher fertility rates.

3.5 Fighting protectionism

In a world characterised by a savings glut, by a negative natural rate of interest, with the risk of secular stagnation, countries strive to obtain trade surpluses. Thereby, they can deflect the problems of the savings glut to other countries. But going for export surpluses is a zero sum game. The risk is there that such game will be transformed into a game of competitive devaluation or of raising trade barriers.

In the international trade games played under such savings glut circumstances the bargaining position of a country weakens with a rising balance of trade surplus. This indicates that a large export surplus of a country may not be a stable situation even if it theoretically is highly competitive under free trade conditions. The political economy of international trade simply may make large export surpluses unsustainable.

Incurring additional public debt and budget deficits may then be the best answer also from the viewpoint of international trade diplomacy. Not only is it

[9] *Myrskylä et al. (2012).*

a protection device against upcoming trade barriers. It also is a device to discourage other countries to decide for trade barriers in view of import surpluses. And thereby such additional public debt which reduces Germany's export surplus can be a benefit to all, because it contributes toward a stabilisation of a world regime of free trade.

4 Conclusion

In a world of a negative natural rate of interest public debt has to be seen with a different view than in the traditional world with a positive natural rate of interest. Substantial additional research is needed to understand the policy implications of the negative natural rate of interest.

References

Barro, R. J. 1974. Are Government Bonds Net Wealth? In: Journal of Political Economy. 1095–1117.

Holtfrerich, C. L., L. P. Feld and W. Heun. 2015. Staatsschulden: Ursachen, Wirkungen und Grenzen; Acatech –Deutsche Akademie der Technikwissenschaften, Munich. 90 pages.

Keynes, J. M. 1936. The General Theory of Employment, Interest and Money. In: The Collected Writings of John Maynard Keynes. Macmillan.London.

Modigliani, F. and R. H. Brumberg. 1954. Utility Analysis and the Consumption Function: An Interpretation of Cross-Section Data. In: Kurihara K. K. (ed.). Post Keynesian Economics. New Brunswick. Rutgers University Press. 388–436.

Myrskylä, M., J. R. Goldstein and Y-H. A. Cheng. 2013. New Cohort Fertility Forecasts for the Developed World. Max Planck Institut für demographische Forschung MPIDR Working Paper 2012–14. Revised April 2013 www.demogr.mpg.de/papers/working/wp-2012-014.pdf.

von Weizsäcker, C. C. 2014. Public Debt and Price Stability. In: German Economic Review. 42–61

von Weizsäcker, C. C. 2015. Kapitalismus in der Krise? – Der negative natürliche Zins und seine Folgen für die Politik. In: Perspektiven der Wirtschaftspolitik Volume 16. 189–212.

Contributors

Karl Aiginger

Karl Aiginger has been the Director of the Austrian Institute of Economic Research (WIFO) since 2005. He studied economics at the University of Vienna and Purdue University in Indiana, USA. His chosen subject for his Ph. D. was How Firms Make Investment Decisions. He obtained the Habilitation in 1984 with his paper Production Theory and Uncertainty, which was also published as a book by Blackwell Publishing. Professor Aiginger began his career at WIFO in 1970 as an economic researcher. His research focuses on industrial economics, competitiveness and strategies of firms, regions and countries. For many years he was responsible for the background reports to the European Commission on the competitiveness of European industry. At various periods (1984–1987, 1996–1998, 2002–2005) he was deputy director and external coordinator at WIFO. On many occasions, Professor Aiginger was also a visiting professor in the USA (Stanford University, MIT, and UCLA). He also teaches at the Vienna University of Economics and Business and is an honorary professor at the University of Linz. He is, together with Marcel Canoy, joint publisher of the Journal of Industry, Competition and Trade (JICT). Since April 2012, he is the coordinator of the research project „WWWforEurope – a New Growth Path for Europe" which the WIFO is undertaking together with 32 partners within the 7th Framework Programme of the EU.

Anne Bucher

In the European Commission since 1983, Anne Bucher is Director for structural reforms and competitiveness in the Directorate General for Economic and Financial Affairs since March 2011. Trained as an economist and statistician in Paris (Ph. D. in macroeconomics, École des Hautes Études and master degree from École nationale de statistique et d'administration économique), Anne Bucher has worked in various fields of European policies: macroeconomic forecast and models, structural funds, evaluation of employment policies, enlargement, development aid, information society strategy and economic analysis of EU tax policy. She has held various management positions, including administrative management positions for HR and budget management.

Nicholas Crafts

Nicholas Crafts is Professor of Economics and Economic History at the University of Warwick, a post he has held since 2006. He is also Director of the ESRC Research Centre on Competitive Advantage in the Global Economy (CAGE), at Warwick. His main fields of interest are long-run economic growth, British economic performance and policy in the 20th century, the industrial revolution, and the historical geography of industrial location. He has published many papers in academic journals and has also contributed to research to the International Monetary Fund and the World Bank. He was appointed Commander of the Order of the British Empire (CBE) in the 2014 Birthday Honours for services to economics.

Alexia Fürnkranz-Prskawetz

Alexia Fürnkranz-Prskawetz holds a doctorate in mathematical economics from the Vienna University of Technology, as well as a second doctorate (Habilitation) in population economics and applied econometrics from the same University. She is professor at the Institute for Mathematical Methods in Economics at the Vienna University of

Technology, deputy director at the Vienna Institute of Demography at the Austrian Academy of Sciences and director of research training at the Wittgenstein Centre for Demography and Global Human Capital. She is working in the field of the economics of population and individual ageing, long run economic growth, agent based models and environmental economics. She has published numerous articles in refereed scientific journals and edited special issues of economic and demographic journals. Alexia Fürnkranz-Prskawetz joined the World Population (POP) Program in July 2013, to work on models of the interrelationship between population, the economy and environment.

Ernest Gnan

Ernest Gnan has been Head of the Economic Analysis Division of the Oesterreichische Nationalbank in Vienna since 1999. He is a member of the European Central Bank's Monetary Policy Committee, and is also an adjunct professor at Webster University in Vienna, teaching courses on economic analysis. During 1998, Ernest Gnan served as deputy head of the Foreign Research Division of the Oesterreichische Nationalbank, and from 1995 to 1997, as an economist in the Secretariat of the Foreign-Exchange Policy Sub-Committee at the European Monetary Institute (a forerunner of the European Central Bank). He is a former national expert in the Directorate General for Monetary and Financial Affairs at the European Commission in Brussels, and a former investment fund manager at Genossenschaftliche Zentralbank in Vienna. Ernest Gnan received a master's degree in commercial sciences and a Ph. D. in Economics at the University of Economics and Business in Vienna.

Thomas Helbling

Thomas Helbling is the Chief of the World Economic Studies Division in the Research Department of the International Monetary Fund, where he co-directs the work on the World Economic Outlook. He has worked on a wide range of issues and countries at the IMF since 1994. Earlier assignments included deputy division chief positions in the Research Department and the Western Hemisphere Department. As an Advisor in the Research Department, he was responsible for the IMF's work on global energy and commodity markets. His recent research papers have focused on commodity price dynamics and global economic conditions; international economic policy issues; international business cycle linkages; and economic history. Thomas Helbling has a doctorate in international economics from the Graduate Institute of International Studies in Geneva, Switzerland.

Andreas Ittner

Andreas Ittner was appointed Vice Governor of the Oesterreichische Nationalbank (OeNB) on July 11, 2013, and is responsible for the Executive Directorate Financial Stability, Banking Supervision and Statistics. Mr. Ittner joined the OeNB in 1983. He was a member of the OeNB's Governing Board from September 2008 prior to his appointment to the post of Vice Governor. In his capacity as Vice Governor, Ittner is the accompanying person of the Governor at meetings of the Governing Council of the European Central Bank (ECB). In addition, Ittner holds numerous national and international functions related to banking supervision, e.g. in the General Board of the European Systemic Risk Board (ESRB), the Board of Supervisors of the European Banking Authority (EBA) and in the Supervi-

sory Board of the Austrian Financial Market Authority (FMA). Previous positions at the OeNB include that of Director of the Financial Stability and Bank Inspections Department.

Juan F. Jimeno

Juan F. Jimeno is Head of the Research Division of Banco de España since October 2004, Professor of Economics (Profesor Titular de Economía) at the Universidad de Alcalá de Henares in Madrid (1992–2004), Research Officer at the Fundación de Estudios de Economía Aplicada (FEDEA) in Madrid (1992–2004). Before he became a Full Professor, he was a Lecturer in Economics at London School of Economics (1990–1991) and an Assistant Professor at the Universidad de Alcalá de Henares (1991–1992). Juan F. Jimeno received his Licenciado in Economics at the Universidad de Alcalá de Henares in 1984 and his Ph. D. in Economics at Massachusetts Institute of Technology in 1990. His main research interests in labor economics are: wage and employment determination; particular labor markets; labor-management relations; trade unions and collective bargaining; mobility, unemployment and vacancies; employment policies. In macroeconomics: economic growth and aggregate productivity; prices, business fluctuations, and cycles; consumption, saving, production, employment and investment; macroeconomic aspects of public finance; macroeconomic policy and general outlook. He won the National Award (Diaz de Santos 1997) for young reseachers in Economics. Juan F. Jimeno joined IZA as Research Fellow in October 1999.

Ewald Nowotny

Ewald Nowotny is the Governor of the Oesterreichische Nationalbank (OeNB) and a Member of the Governing Council of the European Central Bank (ECB). Before taking on his current position in September 2008, Ewald Nowotny held a number of high-level positions in financial institutions. He was CEO of the Austrian BAWAG P.S.K. banking group from 2006 to 2007, served as Vice-President and Member of the Management Committee of the European Investment Bank (EIB) in Luxembourg from 1999 to 2003, and between 1971 and 1979, he was first a Member and then President of the Governing Board of Österreichische Postsparkasse (P.S.K.). Moreover, from 1992 to 2008, Ewald Nowotny served on the supervisory boards of several banks and corporations and was a member of the OeNB's General Council from 2007 to 2008. Ewald Nowotny was born in Vienna, Austria, in 1944. He studied law and political science at the University of Vienna and economics at the Institute for Advanced Studies (IHS) in Vienna. In 1967, he received his doctorate in law from the University of Vienna. He served as a professor at the University of Linz and at the Vienna University of Economics and Business, where he was also Vice-Rector for Financial Affairs. Ewald Nowotny was Vice President of the Austrian Economic Association and is a Member of the University Board of the Vienna University of Economics and Business.

Ugo Panizza

Ugo Panizza is Professor of Economics and Pictet Chair in Finance and Development at the Graduate Institute of International and Development Studies in Geneva. He is also the Head of the Department of International Economics and Deputy Director of the Center for Finance and Development. Prior to joining the Institute, Mr. Panizza was the Chief of the Debt and Finance Anal-

ysis Unit at the United Nations Conference on Trade and Development (UNCTAD) and a Senior Economist in the Research Department of the Inter-American Development Bank. In the past, he worked at World Bank and taught at the American University of Beirut and at the University of Torino. He is a former member of the Executive Committee of the Latin American Economic Association (LACEA) and an editor of the Association's journal Economia. Ugo Panizza is also part of the editorial board of The World Bank Economic Review, the Journal of Economic Systems, and the Review of Economics and Institutions. You can find more about Mr. Panizza's research by clicking the papers and publications link, by looking at VOX pieces, or visiting his Google Scholar and REPEC pages.

Peter Praet

In 2011, Peter Praet joined the European Central Bank as a Member of the Executive Board. He is responsible for economics, human resources, budget, organization and Target2-Securities. Before joining the ECB, Peter Praet was Executive Director of the Nationale Bank van België between 2000 and 2011. He was responsible for international cooperation, financial stability and oversight of financial infrastructures and payments systems. Between 2002 and 2011, he was also Member of the Management Committee of the Belgian Banking, Finance and Insurance Commission (CBFA), where he was responsible for prudential policy for banking and insurance. Mr. Praet served as Chief of Cabinet for the Belgian Minister of Finance from 1999 to 2000, as Chief Economist of Générale de Banque and Fortis Bank from 1988 to 1999, as Professor of economics at the Université Libre de Bruxelles from 1980 to 1987, and as Economist at the International Monetary Fund from 1978 to 1980. Mr. Praet earned a Ph. D. in Economics from the Université Libre de Bruxelles in 1980. He taught Money and Banking at the Université Libre de Bruxelles, and he held the Chair of Business Ethics at the Faculté polytechnique and the Solvay Business School of the Université Libre de Bruxelles. Mr. Praet served on several high-level international committees, including the Basel Committee on Banking Supervision, the Committee on Payment and Settlement Systems, the Committee on the Global Financial System, and the European Banking Authority. He was First Alternate of the Board of Directors of the Bank for International Settlements. Also, he was chairing the Banking Supervision Committee of the European System of Central Banks, as well as a number of task forces and working groups, including the Working group on Fixed Income Strategies of insurance firms and pension funds of the Committee on the Global Financial System and the Research Task Force of the Basel Committee on Banking Supervision. Mr. Praet was a Member of the Board of the European think tank BRUEGEL (Brussels European Global Economic Laboratory) between 2004 and 2011 and is a Member of the International Advisory Council of the International Centre for Financial Regulation (ICFR).

Kurt Pribil

Kurt Pribil was born in Vienna in 1957. He has been a Member of the Governing Board of the Oesterreichische Nationalbank (OeNB) since July 11, 2013. He studied business administration at the Vienna University of Economics and Business and received a Ph. D. in 1983. In 1982, Mr. Pribil started his career in the OeNB's International Division; from 1988 to 1991, he acted as

the OeNB's representative in Brussels. From 1991 to 1999, he served as economic adviser to Wolfgang Schüssel during the latter's terms as Federal Minister for Economic Affairs and Vice Chancellor. Shortly upon his return to the OeNB, Kurt Pribil became Head of the Foreign Research Division, a position he held until 2001. He then joined the Austrian Financial Market Authority (FMA) as member of the FMA Executive Board. Since 2013, Mr. Pribil has chaired the supervisory boards of Casinos Austria AG (CASAG), Oesterreichische Banknoten- und Sicherheitsdruck GmbH (OeBS), Münze Österreich AG (MÖAG), Geldservice Austria GmbH (GSA), IG Immobilien Invest GmbH (IG) and Betriebs-Liegenschafts-Management GmbH (BLM).

Doris Ritzberger-Grünwald

Doris Ritzberger-Grünwald was born in Vienna (Austria) in 1961. She obtained her Master's degree in social and economic sciences from the University of Vienna in 1985, completed the Program in Economics at the Institute for Advanced Studies (IAS) in Vienna in 1987 and obtained her Doctoral degree in social and economic sciences from the University of Vienna in 1991. Following a period as research assistant at the IAS from 1987 to August 1988, she joined the Oesterreichische Nationalbank in 1988, where she started as an economist in the Economic Analysis Division and then moved to the Foreign Research Division. After an interim position as assistant to a Member of the Governing Board she returned to the Foreign Research Division as special adviser, to be promoted in 2000 to the post of Deputy Head of Division. From June 2002 to April 2013, she served as Head of the Foreign Research Division. In May 2013, she was appointed as the OeNB's chief economist (Director of the Economic Analysis and Research Department). Her fields of policy-oriented research include monetary policy, economic growth, convergence issues, inflation, the enlargement of the European Union and the European Monetary Union, with a special focus on Central, Eastern and Southeastern European Countries. She is a member of the Monetary Policy Committee of the European Central Bank and an Executive Board Member of the Joint Vienna Institute.

André Sapir

André Sapir, a Belgian citizen, is Senior Fellow at Bruegel. He is a Professor of Economics at Université Libre de Bruxelles (ULB) and a former Economic Adviser to the President of the European Commission. In 2004, he published An Agenda for a Growing Europe, a report to the president of the European Commission by a group of independent experts that is known as the Sapir report. André Sapir holds a Ph. D. in Economics from the Johns Hopkins University, 1977. At ULB, he holds a chair in international economics and European integration. He is also a Research Fellow of the Centre for Economic Policy Research (CEPR). In addition, he is a member of European Commission President Jose Manuel Barroso's Economic Policy Analysis Group. Mr. Sapir is a founding Editorial Board Member of the World Trade Review, published by Cambridge University Press and the World Trade Organisation.

Hans Jörg Schelling

Hans Jörg Schelling is an Austrian entrepreneur and politician (ÖVP) and took office as Minister of Finance of the Republic of Austria on September 1, 2014. After graduation of the State Secondary School in Feldkirch in 1972, he

studied Business Administration at the University of Linz, finishing his studies with a doctoral degree in 1982. In 1981, Hans Jörg Schelling started his professional career as assistant of the management of Leiner/Kika Group, becoming Managing Director in 1988. In addition, Mr. Schelling founded the Independent Management Consultant Schelling GesmbH that he managed until 2014. In 1992, he took over the management of XXXLutz GmbH. After a restructuring of the company, he became Member of the Supervisory Board in 2005. Amongst others, Mr. Schelling was Managing Shareholder of the Big Deal Marken und Marketingberatungsgesmbh (1999–2014) and Managing Director, XLA GmbH Wels. Before becoming Minister of Finance, Hans Jörg Schelling held several public positions e. g. Vice President of the Austrian Federal Economic Chamber, Member of the Austrian National Council, Chairman of the Managing Board of the Main Association of Austrian Social Security Institutions, Chairman of the Supervisory Board of Volksbank AG and Chairman of the Supervisory Board of the Austrian Social Security Pension Fund.

Sonja Steßl

Sonja Steßl was sworn in as State Secretary for the second time on 1 September 2014. Previously, she had been Secretary of Finance in the Federal Ministry of Finance. In her current position in the Federal Chancellery, Sonja Steßl is responsible for coordinating tasks in the area of administrative management, public service, E-Government and structural policy as well as affairs of the Ombud for Equal Treatment. Ms. Steßl studied law at the Karl Franzens University Graz from 2000 to 2005, which was followed by a court traineeship at the Higher Regional Court Graz. Before becoming Member of the Austrian Parliament in September 2009, she started her professional career as Management Assistant at Joanneum Research Forschungsgesellschaft mbh in 2006. From 2008 to 2009, she was employed with EFKOK AG in the Legal Department. In 2009, she started to work for the NanoTecCenter Weiz Forschungsgesellschaft in the field of company organisation and quality management (leave of absence since December 2013).

Martin Summer

Martin Summer is Head of the Economic Studies Division at the Oesterreichische Nationalbank (OeNB). Before joining the OeNB in 2000, he worked as a lecturer at the University of Vienna, the University of Birmingham and the University of Regensburg. He also worked as a visiting researcher at the Bank of England and the Financial Markets Group of the London School of Economics in 2004. His research interests are banking regulation and systemic risk, financial stability and financial economics.

Carl Christian von Weizsäcker

Carl Christian von Weizsäcker is a globally recognised competition and energy expert with several years of experience in academic consulting and who has been associated with Frontier Economics' Cologne office since 2003. He has appeared as an expert and adviser in numerous competition law cases before the European Commission, the European Court of First Instance, the German Federal Cartel Office, the Office of Fair Trading and other government bodies. He was a Professor of Economics at the Universities of Heidelberg, Bonn, Bielefeld, Bern and Cologne as well as at the Massachusetts Institute of Technology be-

fore retiring from the University of Cologne in 2003. While in Cologne, he was also the director of the Institute of Energy Economics (1986 to 2003). His main research interest is welfare economics, and his applied work focuses on competition policy and energy policy. Carl Christian von Weizsäcker is also a member of numerous other advisory boards of government institutions, organizations and private companies. From 1989 to 1998, he held the chair of the German Monopolies Commission, and since 1977 Carl Christian von Weizsäcker has been a member of the Advisory Council of the German Minister of Economic Affairs. Currently, he is working as a senior research fellow at the Max Planck Institute for Research on Collective Goods.

The Economics Conference hosted by the OeNB is an international platform for exchanging views on monetary and economic policy as well as financial market issues. It convenes central bank representatives, economic policy decision makers, financial market players, academics and researchers.

Publisher and editor	*Oesterreichische Nationalbank* *Otto-Wagner-Platz 3, 1090 Vienna, Austria* *PO Box 61, 1011 Vienna, Austria* *www.oenb.at* *oenb.info@oenb.at* *Phone (+43-1) 40420-6666* *Fax (+43-1) 40420-046698*
Scientific coordinators	*Ernest Gnan, Martin Summer*
Photographs	*OeNB/Niesner, BMF/Loebell*
Editing	*Ingeborg Schuch, Rita Schwarz*
Design	*Information Management and Services Division*
Layout and typesetting	*Franz Pertschi*
Printing and production	*Oesterreichische Nationalbank, 1090 Vienna*

DVR 0031577

Printed according to the Austrian Ecolabel guideline for printed matter (No. 820).

Please collect used paper for recycling.

EU Ecolabel: AT/028/024