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The United States-Euro Area Growth Gap Puzzle

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Ten years ago, the global financial crisis started to unwind in the USA and triggered the greatest recession since World War II. Although the crisis of 2007-08 was caused in the USA, their economy was not hit so hard in the Great Recession of 2009 as in Europe, and in particular in the Euro area. The USA also recovered more rapidly and sustained from the crisis than the Euro area. Additionally, the specific Euro (debt) crisis of 2010 led to a double-dip recession in the Euro area, not joined by the USA. This divergent post-crisis development since then accumulated to a considerable growth gap between the USA and the Euro area. What are the factors behind this different performance? Would a more aggressive fiscal and/or monetary policy in the Euro area have closed the growth gap? As our simulation exercises show: the answer is no. However, the unconventional monetary policy by the ECB since 2014-15 contributed to the most recent recovery in the Euro area. We identify the pivotal reason of Euro areas growth lagging behind the USA in the different experiences in the crises management. The USA has a long-lasting experience in handling financial crises. In historical comparison, the Euro area – the Economic and Monetary Union (EMU) of the EU – is still a "teenager". The crises revealed, that the legal basis of the institutional set-up of EMU and hence of the Euro area was not enough crises-proven. Rescue instruments had newly to be implemented. The global financial crisis was the first great shock which was badly absorbed by the still quite heterogeneous Euro countries. The Euro area, shattered by a succession of external (global financial crisis, Great Recession) and internal (Euro crisis) shocks, could therefore not unfold its growth potential in the last decade. If – hypothetically – the Euro area would have profited from the faster-growing production inputs (capital and labour) as in the USA, the growth gap could have been closed.

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1 September 2017

Abstract

Ten years ago, the global financial crisis (GFC) started to unwind in the USA and triggered the greatest recession since World War II. Although the GFC of 2007/08 was caused in the United States, their economy was not hit so hard in the Great Recession of 2009 as in Europe, and in particular in the Euro area. The USA also recovered more rapidly and sustained from the crisis than the Euro area. Additionally, the specific Euro (debt) crisis of 2010 led to a double-dip recession in the Euro area, not joined by the USA. This divergent post-crisis development since then accumulated to a considerable growth gap between the USA and the Euro area. What are the factors behind this different performance? Would a more aggressive fiscal and/or monetary policy in the Euro area have closed the growth gap? As our simulation exercises show: the answer is no. However, the unconventional monetary policy by the ECB since 2014/15 contributed to the most recent recovery in the Euro area. We identify the pivotal reason of Euro areas growth lagging behind the USA in the different experiences in the crises management. The USA has a long-lasting experience in handling financial crises. In historical comparison, the Euro area - the Economic and Monetary Union (EMU) of the EU - is still a “teenager”. The crises revealed, that the legal basis of the institutional set-up of EMU and hence of the Euro area was not enough crises-proven. Rescue instruments had newly to be implemented. The GFC was the first great shock which was badly absorbed by the still quite heterogeneous member states of the Euro area. The Euro area, shattered by a succession of external (GFC, Great Recession) and internal (Euro crisis) shocks, could therefore not unfold its growth potential in the last decade. If – hypothetically – the Euro area would have profited from the faster-growing production inputs (capital and labour) as in the USA, the growth gap could have been closed.

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1. Introduction

Ten years ago, the global financial crisis (GFC) started to unwind with first the subprime crisis in the USA, followed by failing banks, culminating in the crash of Lehman Brothers on 15 September 2008. Due to the loss of confidence between banks the interbank market collapsed. Unforeseen by most economic experts, these turbulences on the financial markets spurt the greatest recession, since World War II, called by Paul Krugman to distinguish it from the Great Depression of the thirties, the “Great Recession” of 2009. Starting in the USA, the Great Recession spread over to other industrial countries (see Breuss, 2016).

It is a mystery, however, why Europe was more heavily affected (deeper decline of real GDP in 2009) by the Great Recession than the United States. Another puzzle is why the United States was able to recover so quickly and could continue with a sustained growth since then. In contrast, the Euro area, starting from a deeper trough of real GDP in 2009 recovered in 2010 but could not follow up the growth path of the USA. The GFC has caught the Euro area in its year 10 of existence on the wrong foot. The Euro area, still consisting of economically heterogeneous member states, was institutionally and legally not prepared to cope with such a shock. In the recession, public debts exploded and drove up government bond yields to such high levels that made debt financing practically impossible. This specific European development triggered the Euro (debt) crisis. The crises separated the wheat from the chaff, creating a split between the core and the periphery Euro area countries. The latter countries had also to be rescued by newly implemented rescue instruments. Non-Euro countries inside the EU (the United Kingdom) or outside, like Switzerland mastered the GFC similarly superior as the United States.

In the following, we first show the facts of the Great Recession and its consequences in the USA and the Euro area. Then we look at the different reactions to the crisis. Lastly, we try to answer the question who should be blamed for the double-dip recession in the Euro area and the resulting growth gap with the USA, cumulative to around 10% by the end of 2017. Is it the weaker fiscal and/or monetary policy interventions or are supply-side factors behind the puzzle? Or is the still unfinished EMU the major cause behind the weak performance of the Euro area? The succession of crises, the GFC, and the following Great Recession revealed the many flaws in the construction of the EMU. The crises disclosing the fundamental weakness of the Euro area, consisting of countries with different levels of development, divergent positions of competitiveness which resulted in inequalities in the current accounts balances, simply speaking the Euro area misses a “European business cycle”. The periphery Euro area countries missed in the crisis urgently the exchange rate instrument to depreciate in order to

correct its weak competitiveness. Non-Euro countries inside the EU (the United Kingdom) or outside, like Switzerland mastered the GFC similarly superior as the United States.

Whereas the excellent economic performance of the USA (and/or the UK and Switzerland) after the GFC falsifies the thesis of Reinhard and Rogoff (2009), that “this time is not different”, the weak economic performance in Europe, in particular, those in the Euro area seems rough to verify the hypothesis that financial crises need a long time to be resolved.

The following analysis works primarily with quarterly data of Oxford Economics (data bases: July and August 2017) and data from the ECB Statistical Data Warehouse. The policy simulations are carried out with the Global Economic Model of Oxford Economics (OEF). The OEF Global Economic Model¹ is the only macroeconomic model that fully integrates 80 global economies plus the Euro area. The Oxford model is an eclectic model designed to capture the key relationships in the global economy: (i) Keynesian in the short run; (2) Monetarist in the long run. In the short run, shocks to demand will generate economic cycles that can be influenced by fiscal and monetary policy. But over the long run, output is determined by supply side factors: investment, demographics, labour participation and productivity.

2. Growth gap widens after the Great Recession

Since the inception of the EMU in 1999 up to 2008, real GDP grew quite similar in the Euro area (2.1% p.a; EU +2.3%.) than in the United States (2.6%). GDP per capita grew even with the same rate (1.6% p.a.; EU +2%) in both regions. After the Great Recession of 2009 and the Euro crisis of 2010 the Euro area economy fell back considerably relative to those of the USA. Not only the Great Recession of 2009 left deeper marks in the Euro area (real GDP fell by 4.5% in 2009) than in the USA (only -2.8%), the whole Euro project stood at the brink of a break. The Euro (debt) crisis began with the revelation of the deeper indebtedness of Greece than known before in early 2010. Greece’s debt crisis was contagious and infected other economically weak member countries of the Euro area: Ireland, Portugal, and Spain.

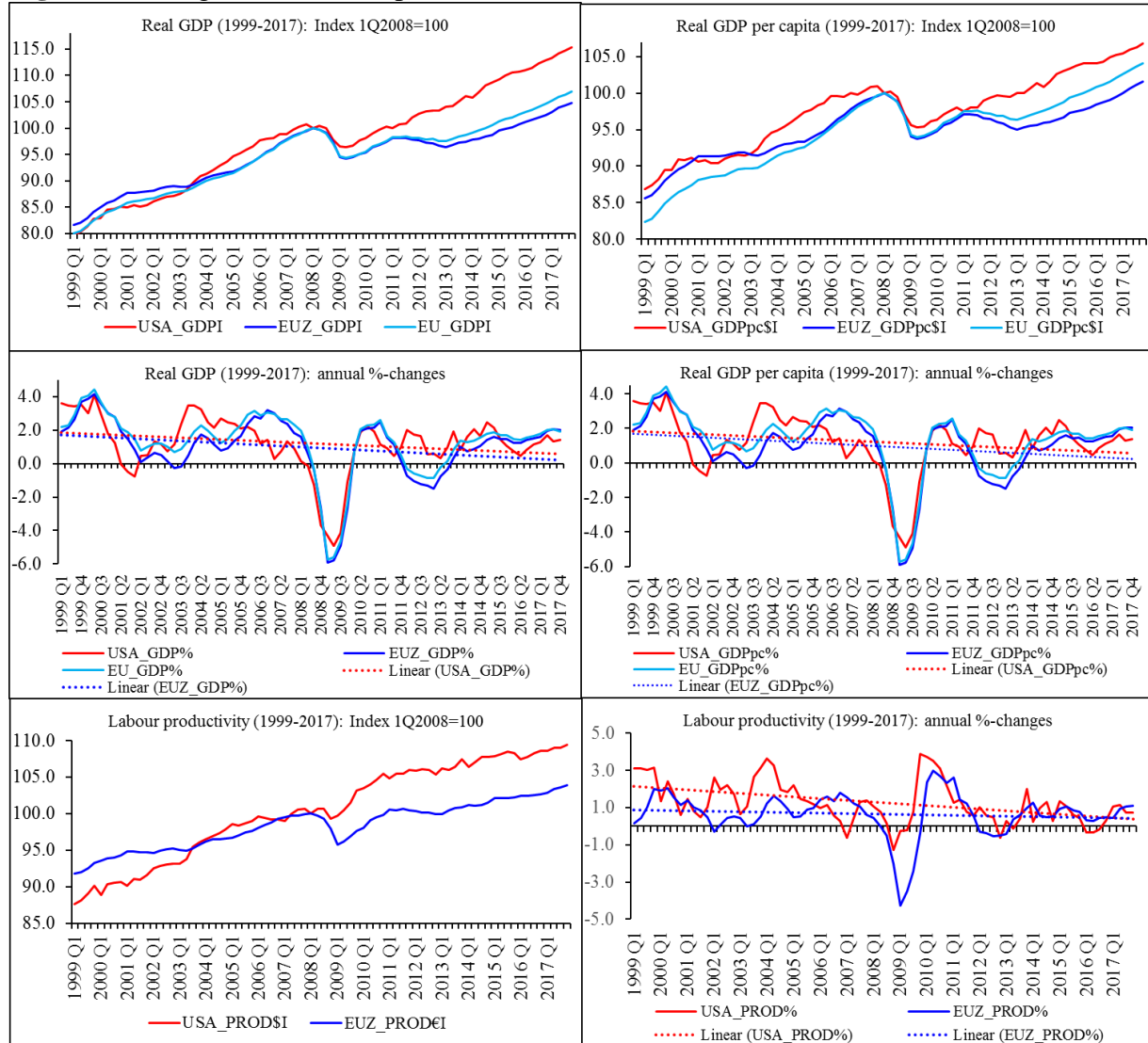
This unique European crisis caused a second shock to the economies of the Euro area with a double-dip recession in the period 2012-2015. The USA, which knew how to handle financial crises, had not this beginner’s problem and its GDP recovered fast and continuously with a growth rate of 2.1% in the post-crisis period 2010-2017. Euro area’s GDP grew only by 1.2%

¹ See the website of Oxford Economics: <http://www.oxfordeconomics.com/>

(EU +1.4%) in the same period (see Table 1). By the end of 2017, the growth gap between the USA and the Euro area since the crises will have accumulated to around 10 percentage points and will continue to widen (see Figure 1b).

Historically, there was already a growth gap USA-Euro area in the period 2003-2005 (see Figure 1a). This was, however, hereinafter compensated by the negative growth gap between 2006 and 2007.

Figure 1a: Long-run economic performance: USA vs Euro area: 1999-2017



EUZ = Euro area

Source: Oxford Economics

Table 1: Macroeconomic performance: USA vs Euro area 1999-2017

	1999-2008	2009	2010-2017	1999-2017
Growth rates in %*				
GDP per capita, real				
USA	1.56	-3.63	1.31	1.17
Euro area	1.59	-4.84	0.87	0.94
EU	1.99	-4.60	1.16	1.28
GDP, real, LCU				
USA	2.55	-2.78	2.11	2.08
Euro area	2.11	-4.49	1.20	1.37
EU	2.31	-4.34	1.44	1.58
Labour Productivity				
USA	1.53	1.04	0.93	1.25
Euro area	0.81	-2.64	0.86	0.64
Total factor productivity (TFP)				
USA	1.21	0.18	0.85	1.00
Euro area	0.60	-3.25	0.74	0.45
Capital stock, real, LCU				
USA	2.60	0.41	1.58	2.05
Euro area	2.34	1.22	0.92	1.68
Total employment				
USA	2.03	-3.77	1.16	0.82
Euro area	1.29	-1.89	0.34	0.72
Unemployment rate %				
USA	5.03	9.28	6.52	6.02
Euro area	8.67	9.64	8.96	9.56
Consumer price inflation				
USA	2.82	-0.32	1.66	2.16
Euro area	2.22	0.32	1.29	1.73
Current account of balance, in % of GDP				
USA	-4.54	-2.58	-4.31	-3.58
Euro area	-0.24	-0.09	-0.01	0.70
Government balance, in % of GDP				
USA	-3.40	-11.93	-6.77	-5.35
Euro area	-1.87	-6.16	-3.17	-2.58
Gross government debt, in % of GDP				
USA	73.92	106.69	89.45	96.91
Euro area	67.73	78.41	72.19	77.16

*) Unemployment rate, current account balance, government balance, gross government debt: averages and growth rates refer to averages or levels in the respective periods.

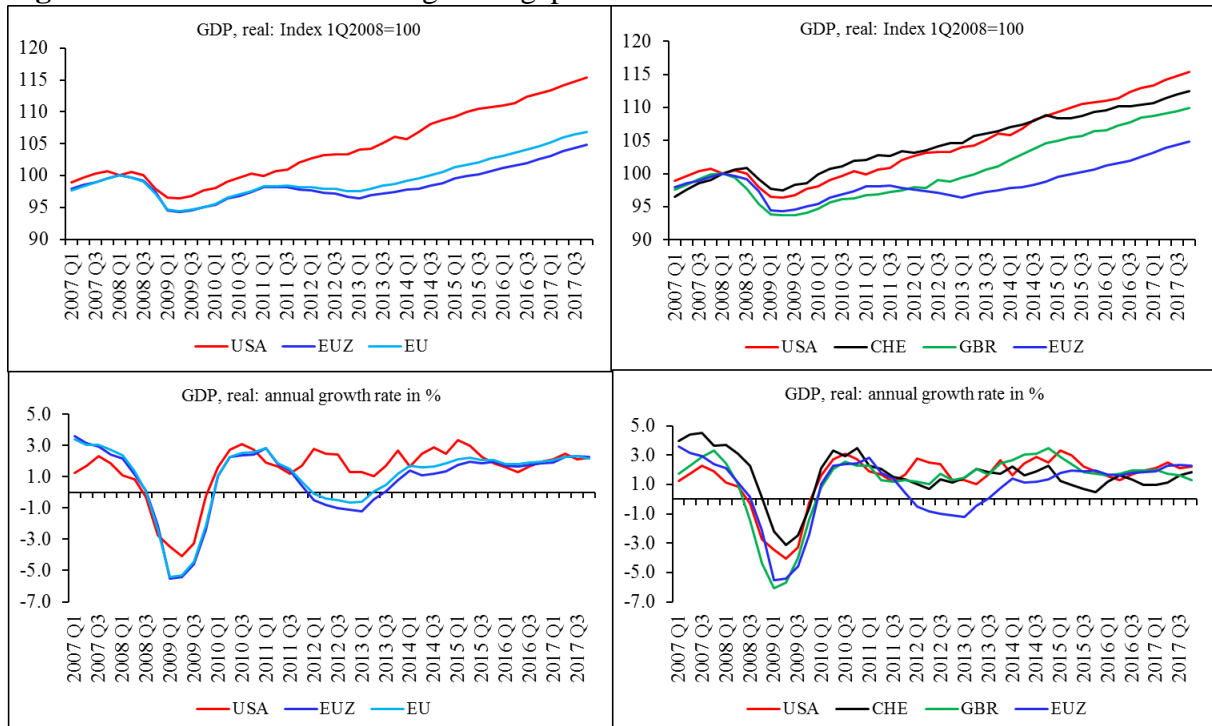
GDP, real and capital stock, real: USA: USD bn., chained 2009 prices; Euro area: EUR bn. 2010 prices. Labour productivity: real GDP per employee; Total factor productivity: $TFP = \text{GDP real} / (\text{Capital stock})^{0.2} * \text{Total employment}^{0.8}$.

Data source: Oxford Economics.

The GFC and the Great Recession not only brought losses in national GDP, disruptions in the labour markets and public-sector indebtedness, it also led to a halt of globalisation. The growth of world trade slowed down considerably after 2009. Whereas world trade and world GDP grew by around 6% and 3.5% respectively before the GFC, afterward trade and GDP grew uniformly by 3.5% (see IMF, 2016, ch. 2).

The Euro area consists of countries with a heterogeneous performance during and after the Great Recession of 2009. The so-called “core” countries of the Euro area (1st graph left at the top of Figure 2) suffered quite similarly from the recession of 2009. They also – with a slight exception of Slovakia - also underwent the double-dip recession afterward. The succession of the crises – GFC, Great Recession and Euro (debt) crisis - hit particularly strongly the economies of the periphery countries of the Euro area (see 2nd graph right at the top of Figure 2). Greece suffered the biggest loss of those groups of countries. Due to revisions in the GDP statistics, Ireland experienced a big jump in GDP growth in 1Q2015. Both graphs at the bottom of Figure 2 show the growth performance in the non-Euro area EU member states.

Figure 1b: The USA-Euro area growth gap after the Great Recession 2009

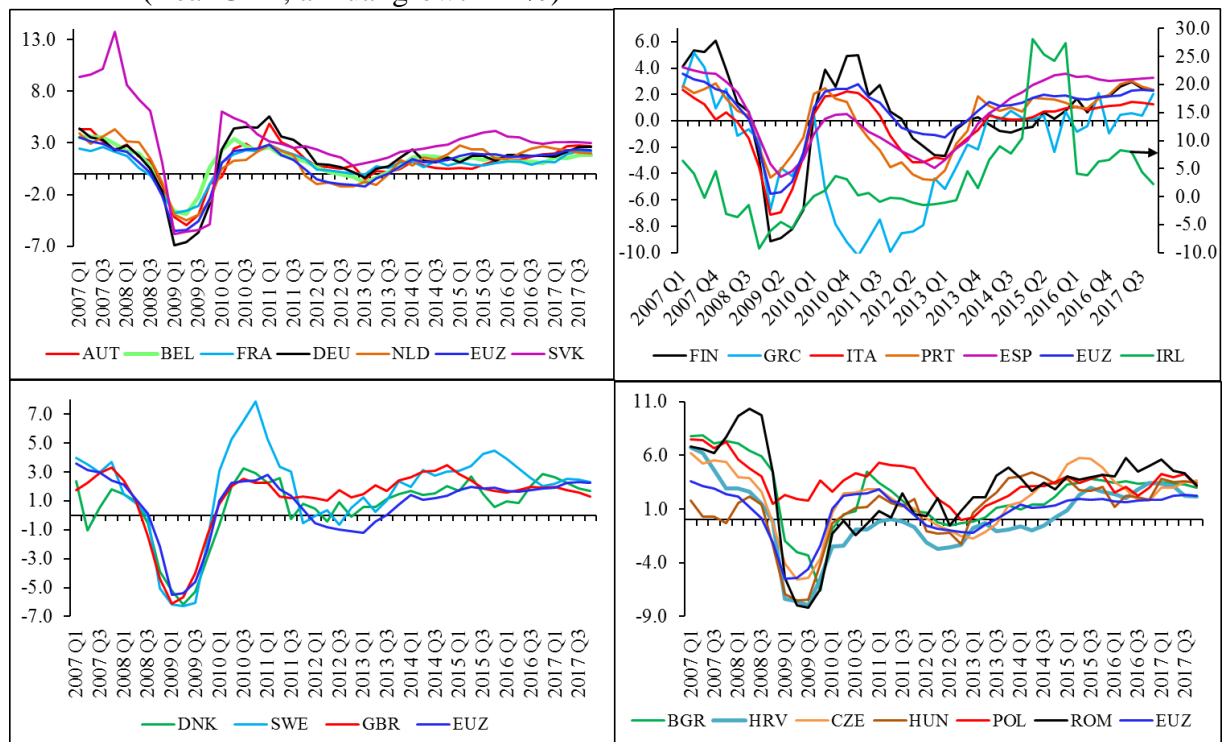


Source: Oxford Economics

Although most member states of the Euro area suffered from the double-dip recession, the core countries, however, performed better than the Euro area average (see Figure 2). The real

GDP of the periphery countries, which suffered hardest from the Euro crisis since 2010, grew below the Euro area average (see Figure 2). This latter group also aggravated the average performance of the Euro area. The left part of the bottom of the graph represents the western non-Euro countries. After the same shock in 2009, they performed better than the Euro area on average. These countries had the important instrument of exchange rate changes at their disposal to absorb the shock of the recession.

Figure 2: Unequal growth performance inside and outside the Euro area after the GFC (Real GDP, annual growth in %)



Source: Oxford Economics

The right-hand graph at the bottom (Figure 2) shows the performance of the new (non-Euro) EU member states of Eastern Europe. Poland stands out with its good performance. It is the only EU member state which did not experience the 2009 recession. With the exception of Bulgaria, these countries suffered much more from the 2009 recession than Euro area average. With the exception of Romania, the exchange rate instrument did not help them to escape from the double-dip recession of 2012-2015.

Interestingly, other non-Euro area countries – either within the EU, like the United Kingdom, or outside the EU, as for instance Switzerland – suffered no double-dip recession (see right panel of Figure 1b). What is the reason for that different performance shortly after the GFC? At first sight, one might conclude that countries with more efficient financial markets and

with a long experience to master financial crises like the United States, the United Kingdom, and Switzerland were able to “cleaned up” the pile of shards of the financial crash much more quickly and efficiently than countries with less experience with financial calamities. All three countries have experience with solving bank bankruptcies and introduced a stronger regime of regulation in the banking sector. Another factor helped them; they had as shock absorber the instrument of exchange rate changes which no longer is available for Euro area member states.

3. Policy interventions, not enough?

Shortly after the outbreak of the financial crisis, politicians feared that it could lead to a Great Depression like in the 1930ies. However, economists and politicians have learned the lessons from the thirties. This time, one wanted not to make the same mistakes and one decided to intervene massively with both macro-policy instruments - fiscal and monetary policy - in order to mitigate the Great Recession of 2009.

3.1 Fiscal policy

As is widely known, fiscal policy can only stimulate the economy in the short-run. In particular, in an economic downturn, Keynesian fiscal expansion is the right medicine. The Great Recession of 2009 was also a great test for the effectiveness of fiscal policy in this crisis. Usually, fiscal policy should only be applied in case of a recession driven by a lack of aggregate demand. The GFC, however, was not so much a demand crisis, but a crisis of the financial sector spreading into the real sector. At the inception of the Great Recession, the governments in the United States and in Europe did not understand exactly the complex mix of causes and took – to be on the safe side - a (fiscal) sledgehammer to crack a nut.

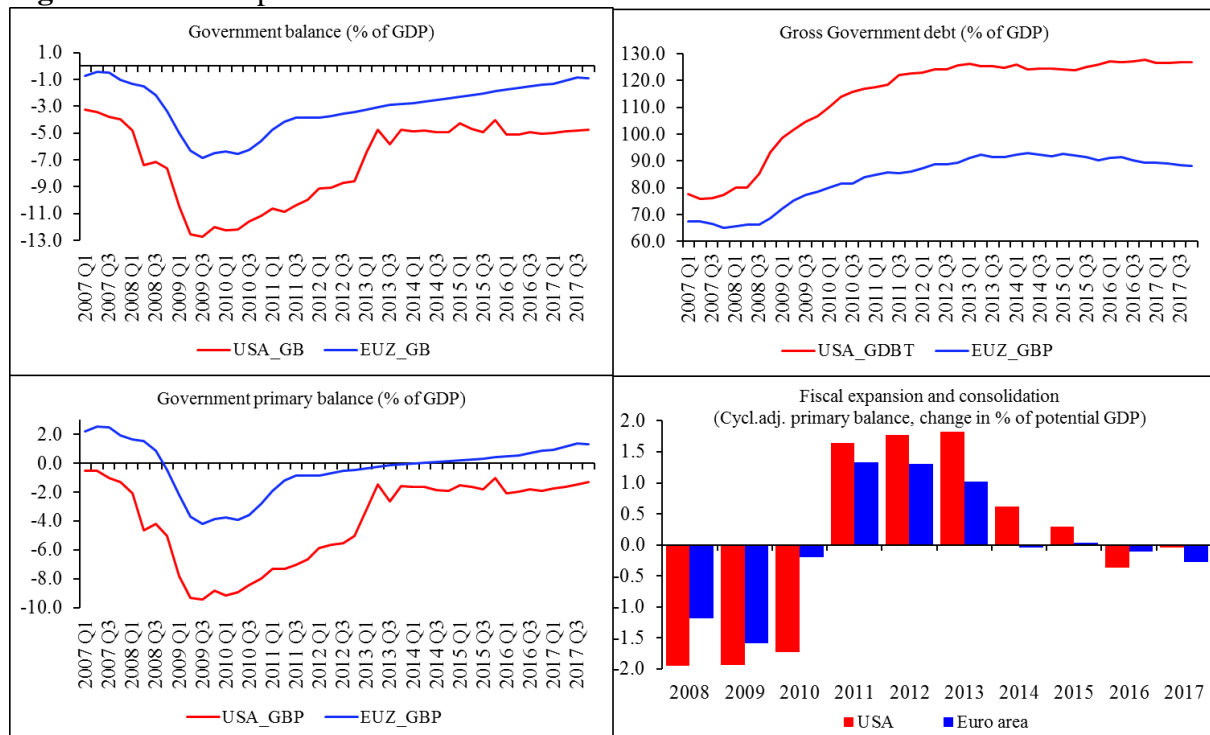
3.1.1 From Keynesian expansion in 2009 ...

The Great Recession of 2009 came as a surprise to politicians and foremost also to the economic experts. Only slowly, one understood the real economic implications of the crash of Lehman Brothers. The European Commission (2009) documented the only gradual revision of the forecasts downwards at the beginning of 2009. The OECD (2014) revealed the considerable forecasting errors across 2007-2012 by 2 ½ percentage points of real GDP. In view of the only slow realization by experts, it is all the more astonishing that the policy quickly counteracted the dangers of a recession. In comparison, one pattern emerges: the US policy (fiscal and monetary) reacted much quicker and more pronounced than the respective institutions in the Euro area.

In the early phase of the Great Recession, both fiscal and monetary policy acted cooperatively together. Shortly after the crisis, however, the phase of policy cooperation was over; since then the monetary policy was the major policy player on the field.

In February 2009, President Barack Obama signed into law the American Recovery and Reinvestment Act of 2009 (ARRA). This Keynesian stimulus package was effective on 17 February 2009 and had originally a volume of US\$ 787 billion, later revised to USD 831 billion between 2009 and 2019. The ARRA package consisted of tax cuts and public expenditures (education, energy, unemployment, etc.). According to OECD (2009) estimates the volume of the ARRA package amounted to 5.6% of 2008 GDP over the period 2008-2010.

Figure 3: Fiscal expansion in 2009 and consolidation thereafter: The USA vs Euro area



Sources: Oxford Economics; IMF (2017).

In the EU and in the Euro area, fiscal policy is in the competence of the member states and is only coordinated by specific instruments at EU level (Stability and Growth Pact, European Semester etc.). Shortly after the Lehman Brothers crash, in November 2008 the European Commission (2008) launched a European Economic Recovery Plan with two key pillars. (1) The Commission proposed that, as a matter of urgency, the Member States and the EU agree to an immediate budgetary impulse amounting to € 200 billion (1.5% of GDP), to boost demand in full respect of the Stability and Growth Pact. (2) The second pillar rested on the

need to direct short-term action to reinforce Europe's competitiveness in the long term with “smart” investment in energy efficiency, infrastructure, and innovation.

According to OECD (2009) estimates the EU members states followed this plan, not with the same vigor. Germany increased fiscal expansion in the period 2008-2010 by 3% of GDP, Spain by 3.5%, but France injected only 0.6% of GDP. The other Euro area countries even were less expansionary. The total Austrian stimulus package in 2009 amounted to 4.2% of 2008 GDP and should have stimulated the economy cumulated by 2.1% (see Breuss, Kaniovski and Schratzenstaller, 2009).

The consequences of the different fiscal stimulus packages in the USA and Euro area resulted in a much deeper budget deficit and public debt in the United States compared with the Euro area (see Figure 3).

3.1.2 ... to fiscal consolidation thereafter

Some authors (e.g. In't Veld, 2013; Heimberger, 2017) blame the fiscal consolidation in the Euro area for the outbreak of the double-dip recession from 2011 to 2014. Taking the change in the primary structural balances of general government, as percent of potential GDP (see In't Veld, 2013 and IMF (2017)) to measure fiscal expansion and consolidation, one sees clearly, that both countries/regions exhibit more or less the same pattern in the fiscal stance since the GFC (see Figure 3 and Table 2). Furthermore, the United States even executed a much more pronounced fiscal expansion to mitigate the Great recession (-5.6% of Potential GDP during 2008 and 2010) than the Euro area (-3.0%). Also, the following fiscal consolidation in the years 2011-2013 were stronger (+5.2%) than in the Euro area (+3.7%)². In the following years (2014 to 2017) the fiscal stance was more or less neutral.

Fiscal consolidation in 2011-2013 was strongest in the five countries which had to be rescued by Euro area rescue instruments (EFSF, ESM), in the so-called “programme countries”: Cyprus, Greece, Ireland, Portugal and Spain. Fiscal consolidation was, however, moderate in the three large Euro area countries, France, Germany, and Italy (see Table 2).

² In the Euro area the New Coordination instrument of the EU, the *European Semester* which started in 2011 (see: https://ec.europa.eu/info/strategy/european-semester_en) paved the way for fiscal consolidation shortly after the recovery of the Great Recession In its first *Annual Growth Survey* the European Commission (2011, p. 3) “focused on an integrated approach to recovery concentrating on key measures in the context of Europe 2020 and encompassing three main areas: (i) The need for *rigorous fiscal consolidation* for enhancing macroeconomic stability; (ii) Labour market reforms for higher employment; and (iii) growth enhancing measures.”

Table 2: Fiscal expansion and consolidation during and after the Great Recession

	Fiscal expansion change 2008-2010	Fiscal consolidation change 2011-2013	Fiscal neutrality change 2014-2017
Cumulative change in cyclically adjusted primary balances in % of potential GDP			
United States	-5.63	5.24	0.49
Euro area	-2.97	3.65	-0.40
PIIGS			
Greece	-0.61	10.03	-0.66
Portugal	-7.03	10.31	0.42
Ireland	-4.45	7.28	0.90
Italy	-1.22	3.17	-1.77
Spain	-6.76	7.36	-0.63
3 large Euro area MS			
Germany	-2.85	2.94	-0.39
France	-2.46	2.72	0.00
Italy	-1.22	3.17	-1.77
2 Non-Euro area countries			
Switzerland	-0.47	-0.62	0.10
United Kingdom	-2.11	2.13	1.84

Source: IMF, Fiscal Indicators: <http://www.imf.org/external/datamapper/datasets/FM/1>

Given this fact, that both countries/regions did fiscally the same, one can hardly explain the growth gap between the USA and the Euro area after the Great Recession with fiscal consolidation.

3.1.3 Small fiscal multipliers in the Euro area

To estimate fiscal spending multipliers, we use the Global Economic Model of Oxford Economics under the assumption of a Taylor-rule based reaction of the central bank interest rates of the ECB and the Fed. Real public expenditures (public consumption) is increased by 1% of GDP in the USA and in the Euro area. For the Euro area, it is assumed that the four major countries – Germany, France, Italy and Spain – jointly increase (sustained) public expenditure by 1% of GDP (see Table 3). Then we differentiate between two periods: bust and boom.

It turns out that firstly, in general, fiscal expenditure multipliers are higher for the United States than for the (more open) Euro area³. Also, the spill-overs to each other are smaller when the Euro area stimulates the economies via the increase of real government consumption. Secondly, the fiscal spending multipliers in the USA and the Euro area are generally higher in bust times than in boom times⁴. For individual countries, the fiscal multipliers vary. Germany's fiscal multiplier, in our simulations is 0.6 (which is also the average value used by the IMF), but for Greece⁵ (1.3) it is even higher than for the USA.

Table 3: Fiscal spending multipliers: The USA vs Euro area (GDP, real %)

GDP real impact in:	Public expenditure increase by 1% of GDP in:				
	Peak GDP impact after quarters:	USA		Euro area	
		BUST	BOOM	BUST	BOOM
USA	6/3	1.70	1.20		
Spillovers to:					
Euro area	2/2	0.14	0.16		
Euro area*)	2/2			0.90	0.81
Spillovers to:					
USA	16/4			-0.90	0.07

BUST = period of the Great Recession (simulation starts in 1Q2009); BOOM = period of expansion (simulation starts in 3Q2007).

Public expenditure = GC (government consumption, real)

*) Euro area fiscal multiplier is the result of a sustained increase of GC by 1% of GDP jointly in Germany, France, Italy and Spain. Assumption: Fed and ECB fix their policy rates according to the Taylor rule.

Source: Simulations with the Global Economic Model of Oxford Economics.

The smaller fiscal multipliers are already an indication that an additional fiscal stimulus during the phase of the double-dip recession would not have been rather promising to eliminate the growth gap vis à vis the USA.

³ In't Veld (2013) find similar fiscal multipliers with the QUEST model of the European Commission (e.g. for Germany 0.8). The fiscal multipliers are higher for public expenditures than for tax cuts. Chodorow-Reich (2017) give an overview about the big variety of estimations of fiscal multipliers.

⁴ The OECD (2017, p. 65) also reports fiscal spending multiplier in a recession of about 2, and in a boom of zero or even negative figures (around -0.5) on average for all OECD countries.

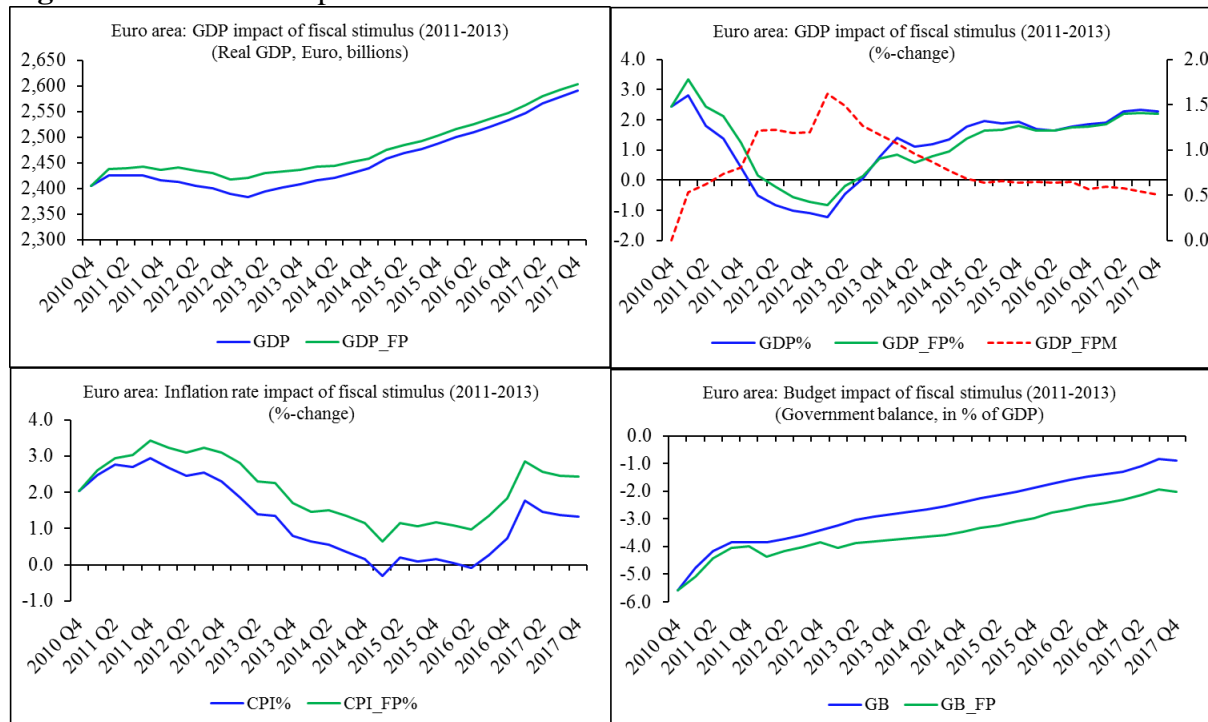
⁵ In the case of Greece, the IMF (partner in the Troika with the ECB and the European Commission) admitted that it had underestimated (used the usual low fiscal multipliers of 0.5 instead of 1.0) the negative impact of the fiscal adjustment programme (see Blanchard and Leigh, 2013). Later this view has been relativized by saying that the forecasting error is based on the wrong estimation of potential output and not on the assumption of too low fiscal multipliers (see Bi and Roaf, 2013).

3.1.4 More fiscal stimuli would not have closed the gap

Only to test, whether a more expansionary fiscal policy in 2011 to 2013 (or a neutralization of the fiscal consolidation in that period) would have closed the growth gap USA-Euro area, we make a similar simulation exercise with the Oxford Global Economic Model as In't Veld (2013) did with the QUEST model to evaluate the economic impact of fiscal consolidation in the Euro area countries over the years 2011 to 2013.

Our simulations with the Oxford Global Model are executed by increasing real government consumption cumulative by 3% of GDP between 2011 and 2013. Thereafter we input into the model a sustained increase by 3%. The fiscal stimulus is done by the two largest Euro area countries, Germany and France which did fiscal consolidation in that period by around 3% (see Figure 4) and they were the Euro area countries with the most leeway concerning indebtedness. In addition, it is assumed that during this simulation exercise the policy rate of the ECB (Main Refinancing Operations- MRO) is kept constant. This implies a higher fiscal multiplier than in that in Table 3.

Figure 4: Euro area: Impact of additional fiscal stimulus 2011-2013



Simulation scenario: Cumulative increase of public expenditure = GC (government consumption, real) by 3% of GDP over the period 2011 to 2013 (afterwards sustained GC increase by 3% of GDP. The GC was increased in the two largest Euro area countries: Germany and France. Assumption: fixed ECB policy rate (MRO). FP = fiscal policy; FPM = fiscal policy expenditure multiplier (right-hand scale).

Source: Simulations with the Global Economic Model of Oxford Economics.

The results show that the Euro area would have increase somewhat its level of GDP and its growth rate. But this would not have been enough to avoid the double-dip recession. As a collateral damage, the budget SGP targets of 3% of GDP would be missed considerably. The additional fiscal stimulus in the years 2011 to 2013 at least could have helped the ECB to better reach the inflation target of 2% at least after 2013. However, previously, additional fiscal stimulus would have overshoot the target (see Figure 4).

3.2 Monetary policy

The GFC 2008/09 was also a great challenge for monetary policy. When conventional (interest rate) policy was exhausted, the Fed switched to unconventional measures (quantitative easing). With both instruments, the Fed reacted quicker and more effectively and stronger than the ECB. When the fiscal policy started to consolidate, monetary policy was the major policy player for stimulating the economy. Although a profound coordination of fiscal and monetary policy would be an optimal strategy to stimulate the economy⁶, the high budgetary and debt burden accumulated during the Great Recession called for a consolidation.

3.2.1 From conventional ...

Starting from a higher level of central bank interest rates (Federal Funds Rate), the Fed started to cut its rate quickly from 5.25% in 1Q2007 to a zero level (0.125%) in 2Q2008. This zero-lower bound (ZLB) was kept until 1Q2015. Then tapering set in and the Federal Funds Rate was gradually increased up to 1.4% in 4Q2017 (see Figure 5).

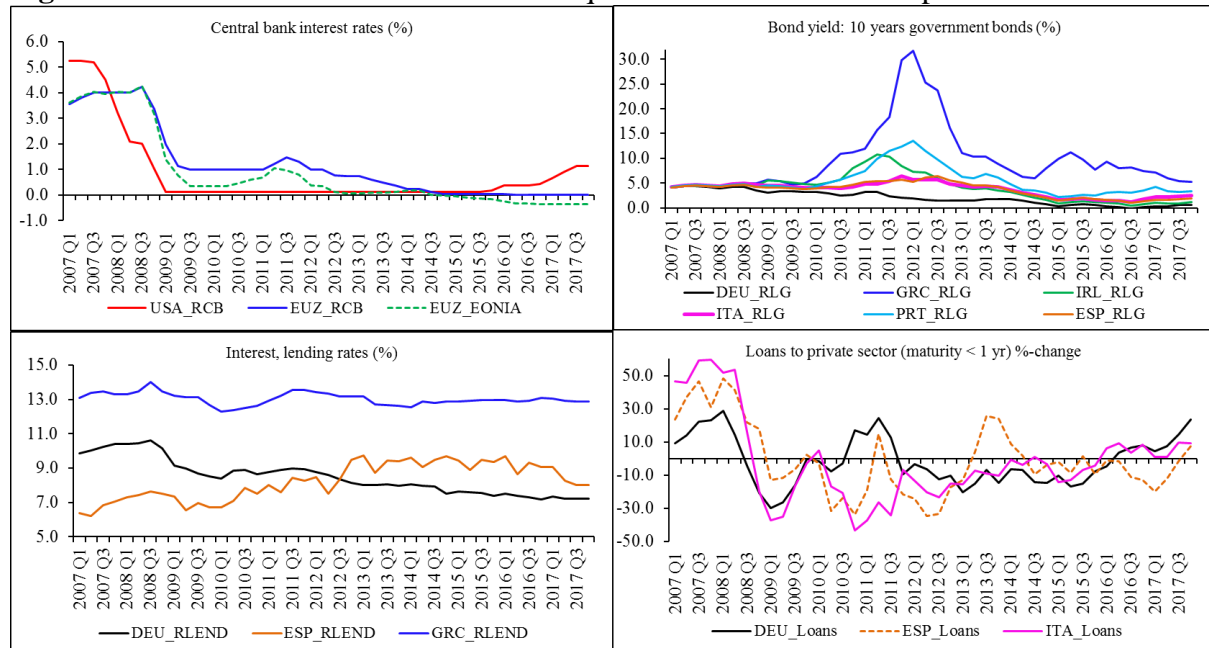
In contrast, the ECB, starting with a lower level of its central interest (MRO) rate with 4% into the crisis, even increased its rate in 3Q2008 to 4.2% although Lehman Brothers were already crashing. Only afterward it reduced the MRO step by step downwards but only to 1% in 2Q2009, staying at that level. In 3Q2011 it even increased it to 1.5%, which was not helpful to overcome the beginning double-dip recession. Only then the ECB cut the MRO rate gradually down to near zero level in 3Q2014. At this point in time, the Fed already discussed tapering its expansionary interest rate (ZLB) policy.

On 11 June 2014, the ECB began to reduce the deposit facility (DFR) rate into the negative range (firstly to -0.1%; later since March 2016 to -0.4%). This development is also mirrored in the EONIA (General Euro Overnight Index average; see Figure 5).

⁶ Bianchi and Melosi (2017) discuss “The Dire Effects of the Lack of Monetary and Fiscal Coordination”.

In 2011 to 2012, due to the Euro (debt) crisis, the 10 years government bond yields in the Euro area periphery countries – most pronounced in Greece – jumped up to unsustainable heights (see Figure 5). Only Draghi’s “Whatever it takes” speech in June 2012 caused a downward trend. During the negotiations and uncertainty of the third adjustment programme for Greece, bond yields increased again slightly.

Figure 5: Interest rate reaction to the crisis: quicker down and earlier up in the USA



EUZ = Euro area; RCB = central bank interest rate (USA = Federal Funds Rate; Eurozone = Main refinancing operations); EONIA = General Euro Overnight Index average; weighted average overnight rate for interbank operations, calculated by the ECB; RLG = Bond yields for 10 years government bonds; RLEND = lending rates in %.

Sources: Oxford Economics; ECB Statistical Data Warehouse.

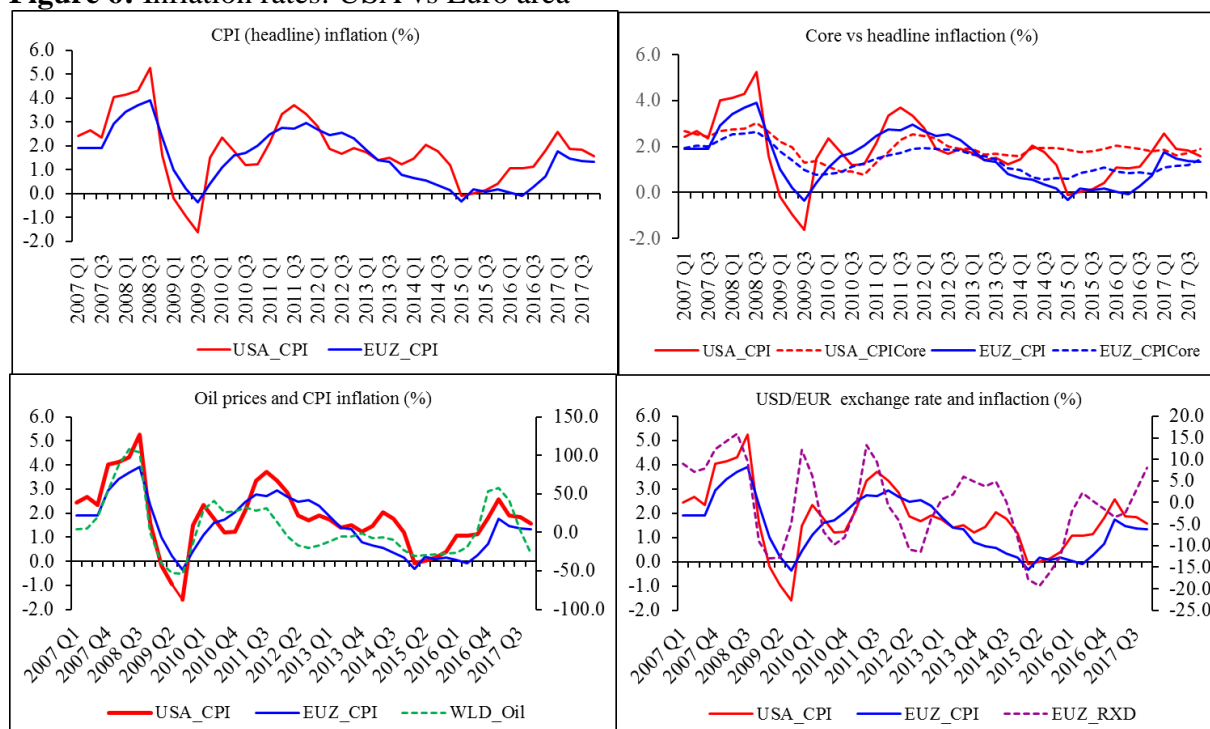
Generally, long-term interest rates for government bonds declined since the GFC in the United States (down to 2%) and in the Euro area (down to 1%; see Figure 7).

As a verdict of this diverging policy development one could say: the ECB was too late and too less aggressive in fighting the crisis. However, one must also consider the fact that both central banks have different mandates. Whereas the Fed has a dual mandate: to maximize employment (reduce the employment rate below 6.5%) and to stabilize inflation at a rate of 2%, the ECB has a single mandate: its primary objective is to maintain price stability (reach an inflation rate below but close to 2%). Therefore, the ECB may – according to Article 127 of the Treaty on the Functioning of the European Union (TFEU) - also support the real side of the economy (GDP, employment) but only if price stability is guaranteed.

The volatility of the inflation rates in both countries depend heavily on the development of the prices for raw materials and oil and the exchange rate development of USD/Euro (see Figure 6)⁷. After the drop of inflation during the Great Recession of 2009, the consumer prices increased to levels targeted by the Fed and the ECB, namely 2% (see Figure 6).

This may explain the behavior of ECB's conventional policy stance. When the inflation rate surpassed the target of 2% in early 2011, it stopped its expansionary stance and even increased its interest rate (see Figure 5).

Figure 6: Inflation rates: USA vs Euro area



EUZ = Euro area; CPI = Consumer Price Index (headline inflation); CPICore = CPI, excluding energy (core inflation); RXD = USD exchange rate vs EUR (increase/decrease is devaluation/appreciation of the Euro vs US dollar); WLD Oil = world energy prices (oil, gas, coal).

Source: Oxford Economics

Although the ECB targets the headline inflation rate (below, but near 2% annual growth). In fact, the ECB is not able to control the world market prices. Therefore, it would be more consistent to target not the headline, but the core inflation (see Figure 6). Maybe it would be wise to refrain from a point target rate of inflation (below, but close to 2%; since May 2003),

⁷ During the weak inflation period since 2014, the ECB feared that potential second-round effects on wage and price-setting could threaten to adversely affect medium-term price developments. Some experts (see Capital Economics (2017) even ask "Is the Philips curve dead" (see also Fuster, 2017). See also the discussion in Smets (2017a).

but to go back to the original target range of inflation rate (below 2%; defined in October 1998; see Breuss, 2017a).

In contrast to the Euro area – where the unemployment rate made a second upward jump (due to the double-dip recession) – and reached a peak in 2Q2013 with a rate of 12.1%, the United States – a consequence of the steady upswing after 2009 – reached its peak in unemployment already in 4Q2009 with a rate of 9.9% (see Figure 12a). Since then the US unemployment rate only knows the way down. It reached the target of Fed’s dual mandate (below 6.5%) already in 2Q2014. Shortly afterward the “tapering” of Fed’s expansionary monetary policy set in.

3.2.1 ...to unconventional measures

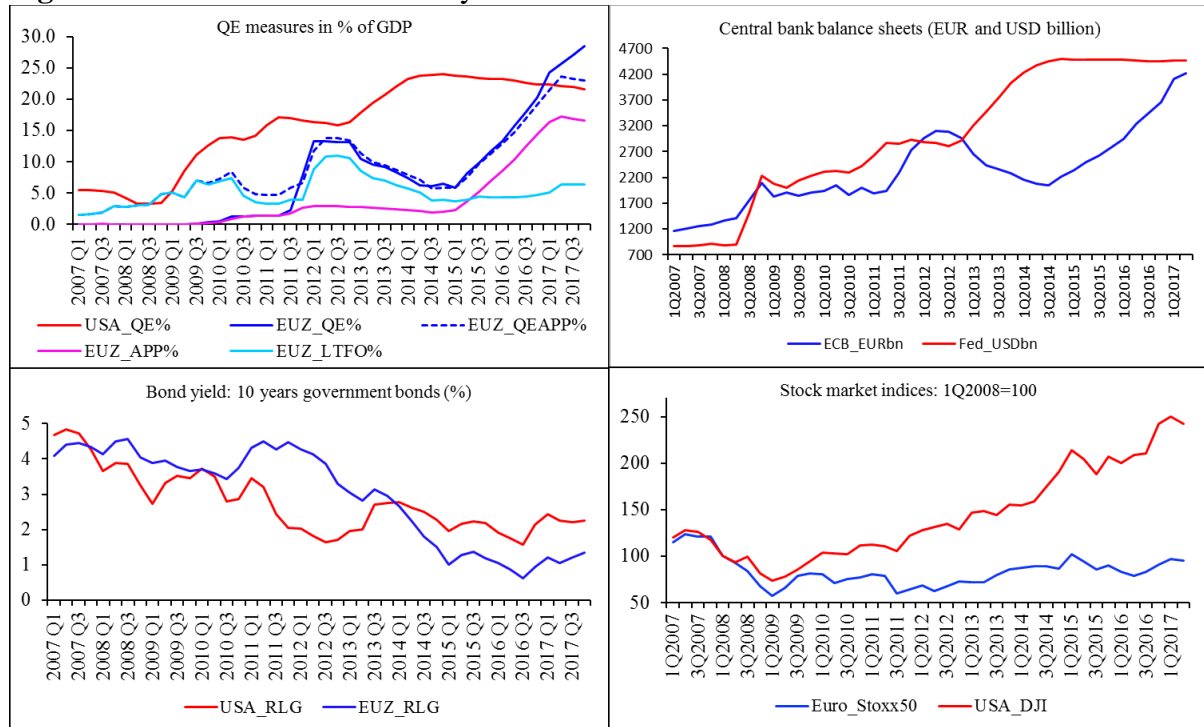
Since the monetary policy at the ZLB has become ineffective⁸, practically all major central banks of the industrial world are applying unconventional measures (QE). As part of the QE policy the Central Banks buy private and government bonds. This increases the total assets of the Central Bank and the monetary base.

The Fed has a much longer tradition in applying unconventional measures like quantitative easing than the ECB. It seems that the ECB is still learning in this respect. Therefore, it is no wonder that the Fed again was quicker and more aggressive in using the instrument of quantitative easing (see Figure 7).

The Fed made QE before the GFC already at a level of around 5% annually. Then in 2Q2009 it started to increase QE to 8.5% and raised it steadily (QE1 to QE3) to the peak of QE as a share of GDP of 24.2% in 4Q2014 (for details, see Breuss, 2017a, p. 205).

Already on 19 June 2013, the then Fed president Bernd Bernanke announced a “tapering” from the ultra-expansionary monetary policy. After the hysterical reaction of the financial markets, tapering was delayed. At the end of 2014, the Fed stopped buying bonds under QE3 and the share of QE in % of GDP began to shrink in 1Q2015 (to 24%) and further to 21.9% in 4Q2017.

⁸ Some authors even postulate negative economic effects of the ZLB policy. See e.g. Gust et al. (2017). The barrier of the ZLB could only be broken in an environment of de-cashing (see Kireyev, 2017). Then the central banks would be able to go down with its interest rates below zero because the bank customers could not react with a bank-run. Being not so far in the financial future, in case of ZLB, the central banks only can rely on unconventional measures, like quantitative easing.

Figure 7: Unconventional monetary measures: USA vs Euro area

QE% = quantitative easing in % of GDP; LTFO = Longer-term refinancing operations; APP = Expanded Asset Purchase Programme; QEAPP% = APP+LTFO in % of GDP; RLG = Bond yields of 10 years government bonds.

Sources: Oxford Economics; ECB Statistical Data Warehouse.

Like the reaction of the ECB with its conventional instruments (interest rate cuts), it started only late with unconventional (in ECB speak: non-standard) measures. Firstly, the ECB introduced liquidity creating measures (Long-term refinancing operations – LTRO) already in 2008, continuing in 2009 and 2011. In 2009, it started with the first Covered Bonds Purchasing Programme (CBPP), continuing in 2011 and 2014.

The actual quantitative easing (QE) program was started with the APP (ECB’s expanded Asset Purchase Programme) on 9 March 2015 with purchases of €60 billion per month until March 2016. Then the programme was extended and increased to purchase €80 billion per month (from April 2016 to March 2017). At ECB’s Council meeting on 9 March 2017 it was decided that (1) key interest rates are kept unchanged, and (2) regarding the non-standard monetary policy measures, the APP will be continued and the purchases of bonds (government bonds: PSPP - Public sector purchase programme; and corporate bonds: CSPP - Corporate sector purchase programme) reduced as of April 2017 to December 2017 to €60 billion (for details, see Breuss, 2017b). By the end of 2017, the ECB will have purchased bonds under the APP programme of about €2.28 billion.

The ECB seems to have behaved not quite consistently to the crisis. This can be seen from the path of the development of QE in % of GDP. Taking also the early liquidity programmes (LTROs) into consideration, there was an increase of 0.2% in 2Q2009 to 13.2% in 3Q2012. The ECB reduced its QE activities gradually down to 5.8% in 1Q2015. Only with the actual APP (“QE”) programme the ECB increased the QE share in GDP to the temporary peak of 25.5% in 4Q2017. Whether the ECB starts tapering in 2018 is an open question.

3.2.2 Whatever it takes to preserve the euro

In contrast to the United States with its more than 100 years long central banking tradition (the Federal Reserve System – the Fed – was founded on 23 December 1913), the Euro area with its young ECB (in power on 1 June 1998) did not yet experience a global financial crisis like those of 2007/08. The Great Recession of 2009 and the following Euro crisis of 2010 were therefore the first large shocks and a test for the survival of the Euro project. Since the crises, therefore, the monetary policy in the Euro area consisted not only in a simple implementation of conventional and unconventional measures, but it was primarily a task of the survival of the Euro. Then the missing rescue instruments (EFSF, ESM) and regulations in the banking sector (European Banking Union) had to be created newly. In addition, on the fiscal side, the coordination process had to be reformed (SGP, Fiscal Compact, European Semester).

The rescue operation for the PIIGS and three important political statements stopped the expectation that the Euro area could break. Commissions President José Manuel Barroso (in November 2011) and German Chancellor Angela Merkel (in August 2012) declared to do whatever they can do to keep the Euro area in its present dimension of 19 Member States. These commitments and the most important message by ECB President Mario Draghi made more or less off the record in his speech at the Global Investment Conference in London, 26 July 2012 (“*Within our mandate, the ECB is ready to do whatever it takes to preserve the euro. And believe me, it will be enough*”) helped to reduce the probability of a breaking-up of the Euro area. After Draghi’s statement, on 2 August 2012, the Governing Council of the ECB announced that it would undertake Outright Monetary Transactions (OMT) in secondary, sovereign bond markets, aimed “at safeguarding an appropriate monetary policy transmission and the singleness of the monetary policy.”⁹

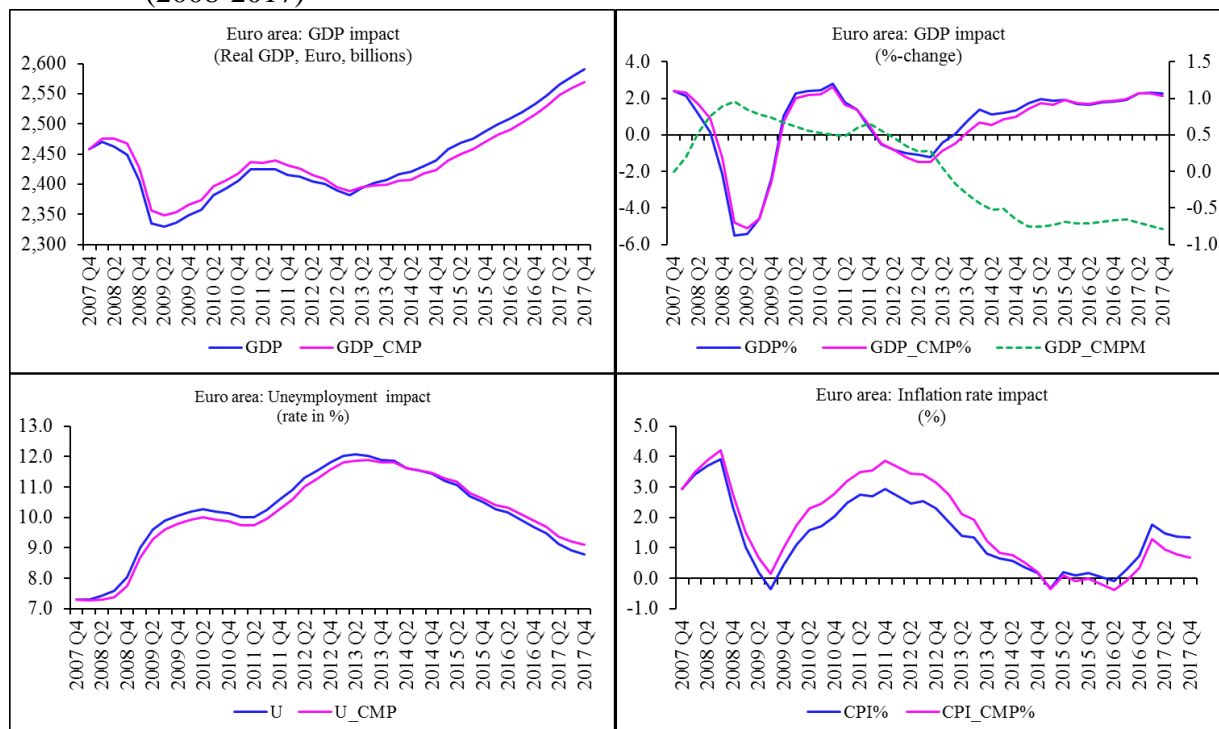
⁹ The OMT program (Outright Monetary Transactions) was strictly tied to reform conditions and was designed essentially only for the program euro-zone countries (Greece, Ireland, Portugal and Spain; see ECB, 2012). However, no program country has made use of the OMT program. Instead, there was a great legal dispute over

Both announcement policies turned out as the greatest success of the ECB's policy. They brought down the spreads of government bonds of the periphery countries, in particular in Greece (see Figure 5)

3.2.3 Even copying the Fed would not have closed the gap

Like in the case of fiscal policy one can ask the question whether a more aggressive monetary policy (conventional and unconventional) would have contributed to avoiding the double-dip recession. In order to answer this question, we make an extreme simulation exercise. We simply simulate with the Global Economic Model of Oxford Economics the macro-economic effects of a situation in which the ECB would simply have copied the Fed policy. Given the fact that the Fed was more aggressive than the ECB, the adoption of Fed's monetary policy should also have improved Euro area's economic performance.

Figure 8: Euro area: Impact of copying Fed's conventional (interest rate) monetary policy (2008-2017)



Simulation scenario: The ECB sets the same policy rate as the Fed (MRO=Fed Funds Rate) over the period 1Q2008-4Q2017). CMP = conventional (interest rate) monetary policy; CMPM = monetary multiplier of conventional monetary policy (right-hand scale).

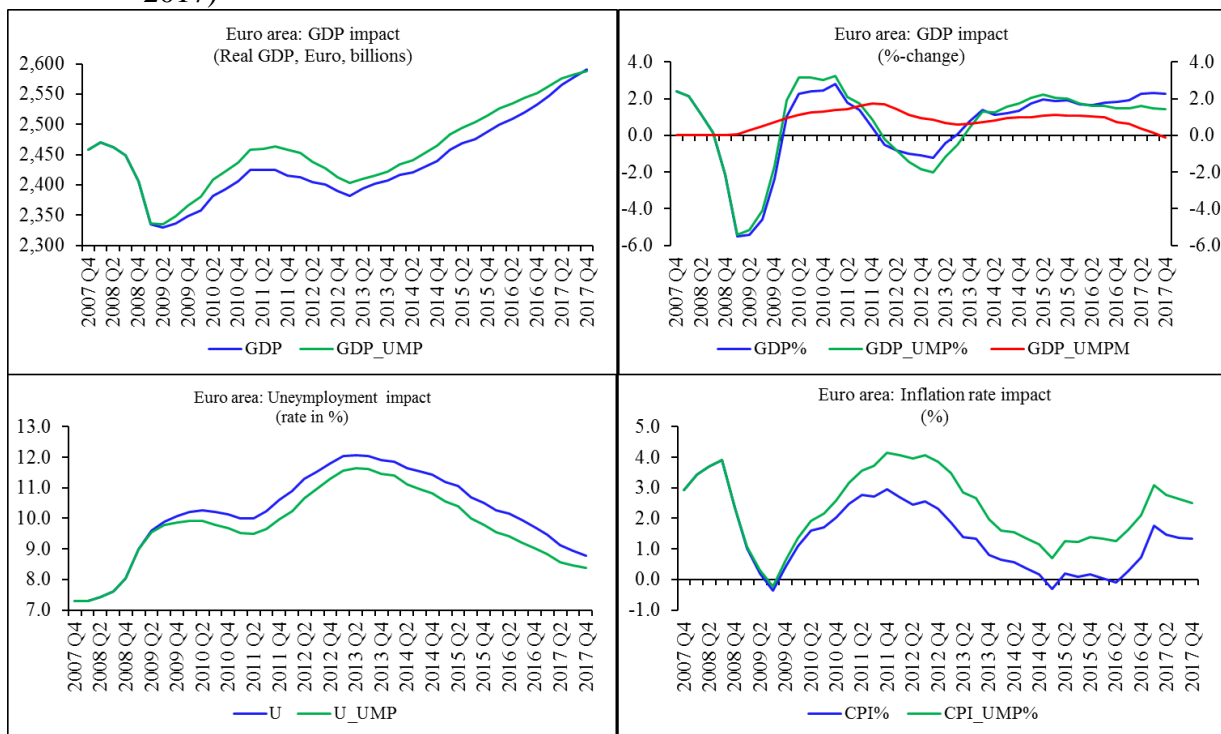
Source: Simulations with the Global Economic Model of Oxford Economics.

the compatibility of the OMT programme with EU law. On 16 June 2015, The European Court of Justice (ECJ) ruled that it is compatible. On 21 June 2016, the German Court of Justice (Bundesverfassungsgericht) – who initially asked the ECJ in this case – also accepted the ECJ ruling.

First, we simulate the impact of *conventional monetary policy* by setting the ECB policy rate (MRO) to the level of Fed's Federal Funds rate over the period 1Q2018 to 4Q2017. In the first phase (2008 to 2013) this would have helped to increase real GDP slightly in the Euro area. Afterwards, as the Fed started to embark into tapering with a step-by-step increase of the Fed Funds Rate, the GDP effect would have been negative (see Figure 8). This policy scenario would also not have helped - at least after 2014 - to attain the ECB inflation target of 2%.

Then, we simulate the impact of *unconventional monetary policy* by substituting ECB's QE level (in % of GDP) with those of the Fed over the same period. In this scenario, the level of real GDP in the Euro area could have been lifted until the end of the simulation exercise (see Figure 9). In this scenario, Euro area inflation target would have been reached better than with the more cautious ECB QE policy.

Figure 9: Euro area: Impact of copying Fed's unconventional (QE) monetary policy (2008-2017)



Simulation scenario: The ECB executes the same quantitative easing (QE) policy as the Fed over the period 1Q2008-4Q2017). UMP = unconventional (QE) monetary policy; UMPM = monetary multiplier of unconventional monetary policy (right-hand scale).

Source: Simulations with the Global Economic Model of Oxford Economics.

Even this spectacular scenario – ECB(QE) = Fed(QE) – would not have helped to profoundly close the growth gap, caused by the double-dip recession of 2011 to 2014. One reason might

also be that – similar as in the case of fiscal policy – the monetary multiplier in the Euro area, both in the case of conventional (interest rates) as in the case of unconventional policy (quantitative easing) are smaller than in the USA (see Table 4).

QE multipliers on real GDP in DSGE models are in the range of 0.1 to 0.4 for the USA and 0.2 to 0.6 for the UK (see Breuss, 2017a). In our simulations with the Oxford Global Economic Model the QE multiplier on real GDP in the Euro area is 0.08 (in the flexible interest rate scenario) and 0.09 (in the ZLB scenario) and for the USA 0.20 (see Table 4).

Table 4: Monetary multipliers of conventional and unconventional policies: The USA vs Euro area (GDP, real %)

GDP real impact in:	Conventional monetary policy			Unconventional monetary policy		
	Reduction of central bank interest rate by 1% in:			Increase of QE by 1% of GDP in:		
	Peak GDP impact after quarters:	USA	Eurozone	Peak GDP impact after quarters:	USA	Eurozone
USA	12	1.64		9	0.20	
Spillovers to: Eurozone	7	0.21		6	0.03	
Eurozone	11		0.68	12		0.08
Spillovers to: USA	10		0.05	11		0.01

Interest rate, central bank policy: USA = FFR = Federal Funds Rate; Eurozone = MRO = Main Refinancing Operations; QE = Quantitative easing in % of GDP

Source: Simulations with the Global Economic Model of Oxford Economics over the period: 3Q2017-4Q2022.

3.2.4 Economic impact of ECB's QE policy 2015-2017

The ECB started its massive unconventional policy stimulus with the expanded asset purchase programme (APP) in March 2015. As described earlier, the ECB will have bought bonds at the amount of €2.28 billion by the end of 2017. By far the biggest part (over 80%) of the APP programme contributes the PSPP (Purchase sector programme).

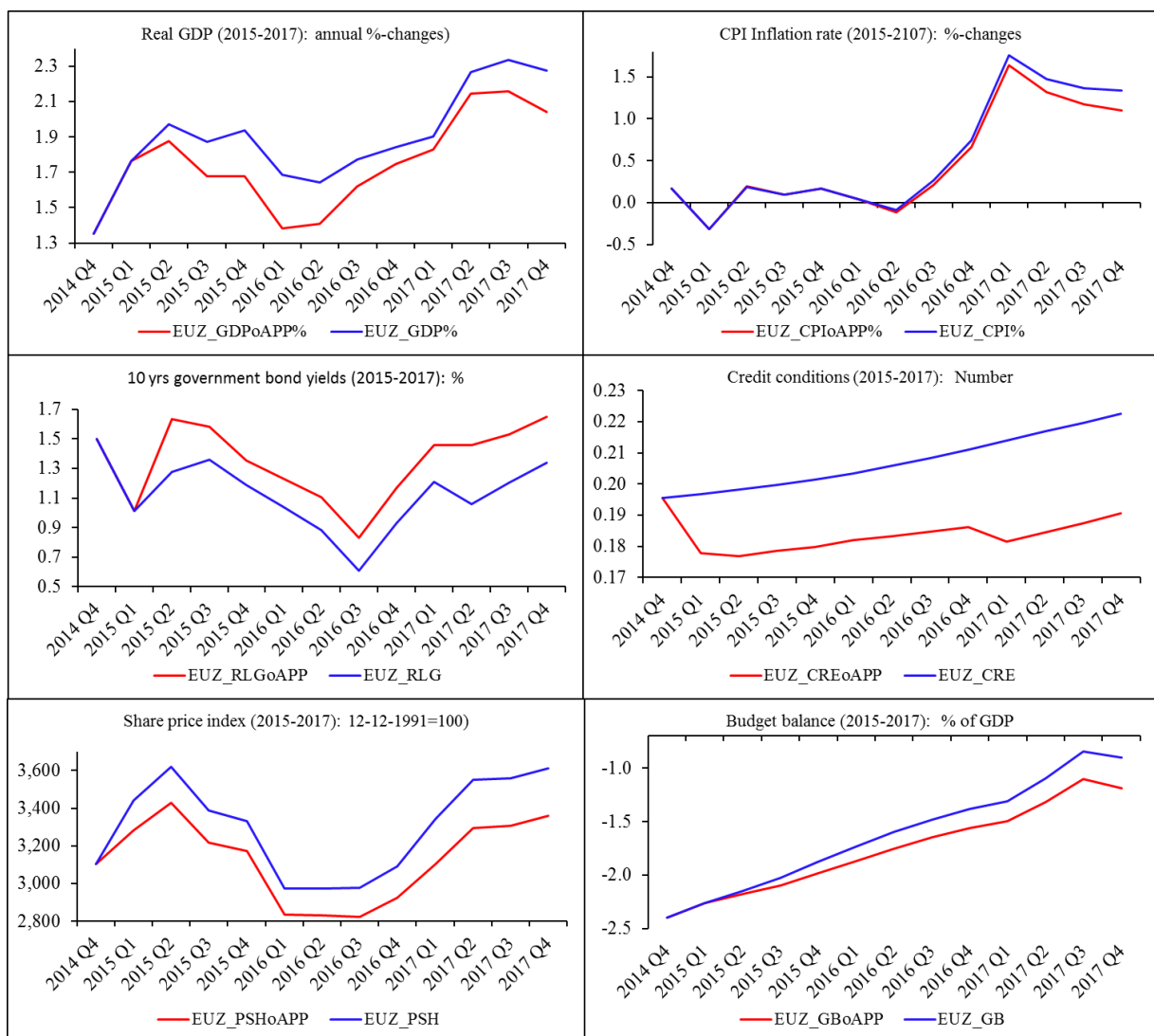
On 22 January 2015¹⁰, the Governing Council of the European Central Bank (ECB) announced an expanded asset purchase programme (APP) in fulfilling its price stability mandate. The primary motivation for the ECB to start with a massive QE programme, was to avoid deflation and to reach its own inflation target of an inflation rate of below but close to 2%. This intended target could, however, not (yet) been reached since starting with ECB's QE (APP) in March 2015. Inflation did not come near the 2% target (see Figure 6).

¹⁰ See: https://www.ecb.europa.eu/press/pr/date/2015/html/pr150122_1.en.html

Besides this *intended* effect of ECB’s QE policy (the return of inflation rates towards 2%) the ECB also mentioned indirect (*unintended*) effects by the following statement: “*Asset purchases provide monetary stimulus to the economy in a context where key ECB interest rates are at their lower bound. They further ease monetary and financial conditions, making access to finance cheaper for firms and households. This tends to support investment and consumption, and ultimately contributes to a return of inflation rates towards 2%.*”

In the following, we try to quantify the effects of ECB’s APP programme in the period 1Q2015 to 4Q2017 via simulations with the Global Economic Model of Oxford Economics. Implementing the amounts of the already executed and the planned asset purchases in the context of APP until the end of 2017 the model simulations give the following macro-economic results for the Euro area (see Figure 10):

Figure 10: Intended and unintended economic impact of ECB’s QE-APP policy: 2015-2017



GDP_{oAPP} (in red) = scenario for real GDP (and the other variables) without ECB's QE-APP policy. This scenario is compared with a scenario with APP (blue lines).

Source: Simulations with the Global Economic Model of Oxford Economics.

- The primary target – to bring the *inflation rate* back to 2% - was clearly missed. The APP programme only added cumulative 0.3 percentage points to the Euro area inflation rate by the end of 2017¹¹. Only if the APP would be continued until the end of 2020 the inflation target of 2% could be reached.
- *Real GDP*, however, has been stimulated by the APP and explains the upswing of the Euro area economy in 2017. From 1Q2015 until the end of 2017 the APP will have increase real GDP in the Euro are cumulative by 0.6 percentage points¹². This implies that the real GDP growth rate without APP would have been in 2015 1.8% instead of the realized 1.9%, in 2016 1.5% instead of 1.7% and in 2017 2% instead of 2.2% (if ECB would continue the APP in 2018 with purchases of €60 billion per month, then in 2018 real GDP in the Euro area without APP would growth with a rate of 1.7% instead of forecast 1.8%)¹³.
- The economic impulse to GDP – via consumption and investment – came about because the APP improved the *credit conditions*¹⁴.
- *Government bond yields* came down by 30 bps. This helped – primarily the periphery countries of the Euro area – to consolidate the budget.
- Euro area *budget balance* will decline because of the APP by nearly 0.3% of GDP by the end of 2017.
- Besides the considerable transformation of ECB's unconventional monetary policy into the real sector of the economy (improved credit conditions led to a stimulation of consumption and investment and hence, real GDP), the APP brought major impulses to the financial sector. Cheap money led also to a boom in the stock markets (see the impact on *share prices* in Figure 10).

¹¹ According to ECB's own estimates (see Smets, 2017a) the ECB's inflation impact of APP since 2014/15 is much stronger than in our simulations. Accordingly, APP could have increased Euro area's inflation rate by 0.8 %pts in 2016, by 0.5%pts in 2017 and (expected) by 0.15%pts in 2018.

¹² In a earlier similar simulation exercise with the Oxford Global Economic Model, which, however, assumed that ECB's QE programme only runs from 1Q2015 to 1Q2017, Breuss (2017a) finds lower GDP effects: until 2Q2017, cumulative only 0.2%.

¹³ According to ECB's own estimates (see Smets, 2017a) the impact of ECB's APP since 2014/15 on the real economy was even more pronounced than in our simulations. Accordingly, APP should have contributed to the growth rate of real GDP (already) by 0.9%pts in 2016, by 0.5%pts in 2017 and (expected) by 0.2%pts in 2018. This pattern of impact, starting with a strong positive effect and declining thereafter, implies a VAR analysis technique,

¹⁴ ECB (2017b, p. 18) reports that the July 2017 euro area bank lending survey suggests that loan growth continued to be supported by easing credit standards and increasing loan demand by non-financial corporations and households.

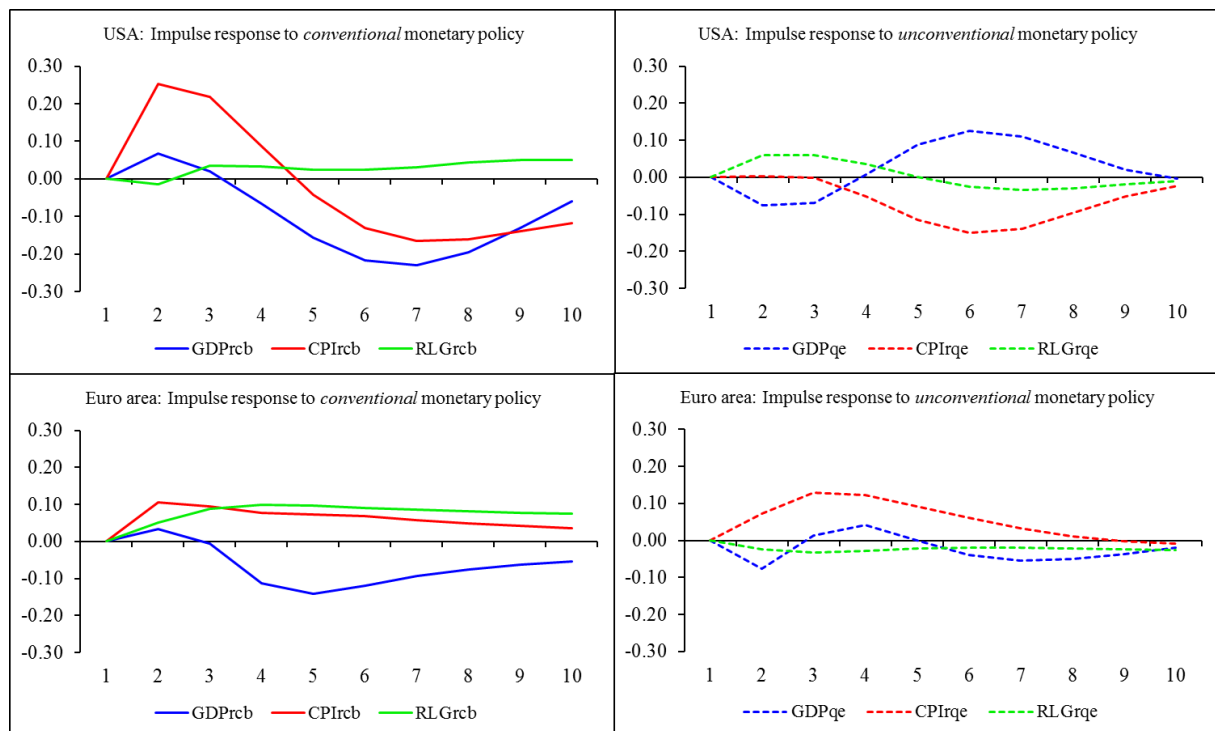
According to our model simulations, the USD/EUR exchange rate was influenced not very much by the APP. Many other external effects had a much more pronounced effect on the development and volatility of the Euro exchange rate during the last few years.

Overall, the primary goal of the whole QE action of the ECB was clearly not reached. To quote Smets (2017b): “We’re not yet there”. However, we can only underline ECB’s own verdict about its QE action since 2014/15 by saying “The positive effects are stronger than the negative ones” (see Smets, 2017b).

Box: VAR analysis of conventional and unconventional monetary policy

Besides the structural macro-economic models (e.g. the OEF Global Economic Model) other methods such as DSGE models (for an overview, see Breuss, 2017a) and Vector Autoregressive (VAR) models in different variations, from structural to time-varying types (TVARs) are used to evaluate conventional and unconventional monetary policy measures.

Table B1: Impulse-response functions of estimated VARs for the USA and Euro area



Conventional monetary policy shock: Increase of central bank policy rates (RCB) (USA: Fed Funds Rate; Euro area: ECB’s MRO) by 1%pt.

Unconventional monetary policy shock: Increase of quantitative easing (QE) by 1% of GDP.

GDP = real GDP (annual %-changes), CPI = CPI inflation rate (annual %-changes); RLG = 10-year government bond yields in %;

Estimation with EViews 9.0: 1Q2009-4Q2017; two lags; results for 10 quarters: Data base: Oxford Economics).

First, we show the results of own estimates with the Structural Vector Autoregression approach (SVAR), using EViews 9.0 and data from Oxford Economics. The estimation runs over the period 1Q2009 to 4Q2017 and includes the following variables: real GDP (annual %-changes), CPI inflation (annual %-changes), 10-year government bond yields in %, central bank policy rates (USA: Federal Funds Rate; Euro area: ECB's MRO) in % and quantitative easing (QE) in % of GDP.

The left panel of Table B1 shows the results for the conventional monetary policy impulse (increase of the central bank policy rates by 1%pt) in the USA (Fed) and in the Euro area (ECB); the right panel shows the results of unconventional monetary policy impulse (increase of QE by 1% of GDP) in the USA (Fed) and in the Euro area (ECB).

- The general pattern confirms our macro-model simulation results: the effects are in all cases higher in the USA than in the Euro area (see our differences of monetary policy multipliers in Table 4).
- Conventional (interest rate) monetary policy impulses yield the expected results: an increase in interest rates increases inflation and government bond yields, but have a negative impact on real GDP.
- Unconventional (QE) monetary policy impulses also yield the expected results: inflation goes up immediately, real GDP only lagged; and government bond yields increase. The major difference between the USA and the Euro area is in the impact on inflation: in the Euro area it goes up, in the USA it declines.

Second, we report the results of two recent VAR analysis of the impact of conventional and unconventional monetary policy. Filardo and Nakajima (2017) demonstrate with time-varying TVARs that unconventional monetary policy is effective even in a low-interest rate environment, but the effects are small. In all four countries, USA, Japan, UK and Euro area, the macro effects on lending rates, are very similar and as expected: a 10bp QE announcement shock leads to a (short-run) decline in lending rates (USA – 30bp; Japan -40bp to -60bp; UK - 60bp; Euro area only -25bp), a small short-run increase in output (USA +0.2%p; Japan +0.2%p; UK +0.25%p; Euro area only +0.15%p) and a small sustained increase in inflation (USA +0.07%p; Japan zero or even negative; UK +0.1%p; Euro area 0.025%p). This TVAR exercise confirms our macro-model simulations, namely the effects are always higher in the USA than in the Euro area (see Table 4).

Feldkircher and Huber (2016) compare US conventional with unconventional policy over a longer period (1Q1984 to 1Q2015) with time-varying vector autoregressions with stochastic volatility (TVP-SV-VAR). The unconventional policy is measured by a “spread shock” (yield on 10-year-government bonds minus the Federal Funds rate). The macro effects are somewhat higher for conventional policy in the post-GFC crisis (after 2009) period than for the pre-crisis period. An interest rate shock (-100bp) leads to a short-term increase of real GDP growth of 0.5% and a very short-term increase of Inflation (+0.3%). The effects of unconventional policy (a spread shock of -100bp) increase also real GDP growth (but only by 0.25%) and inflation very short-run by 0.25%. The conventional monetary policy works strongly through expanding assets and deposits of the banking sector, while the impact on consumer wealth growth is more modest. The unconventional monetary policy works mainly via the wealth channel thereby spurring aggregate demand. There is less evidence for the credit/bank lending channel.

According to Constancio (2017), ECB’s monetary policy was successful in the following areas:

- Credit easing measures and APP brought down interest rates for 10 years government bond yields by 1% in the period June 2014 to March 2017.
- The lending rate to NFCs (non-financial corporations) went down by 1.5%
- The NEER (nominal effective exchange rate) of the Euro dropped by 9%
- Stock prices of the Euro Stoxx went up by 15%.

According to ECB’s Annual Report 2016 (ECB, 2017a), the composite costs of debt financing for banks went down in the Euro area countries from 4% in 2012 to around 1% in 2017. And the composite bank lending rates for non-financial corporations and households decreased from 3.5% in 2012 to around 2% in 2017.

The distributional impact of ECB’s policy in the Euro area – winners and losers:

Looking on changes of net-interest income across sectors, one can identify winners and losers of the ZLB policy (see ECB, 2017, p. 49):

- *Winners* are the government and the non-financial corporations. Between 2Q2008 and 3Q2016 (2Q2014-3Q2016) the governments in the Euro area saved interest rate payments

of 0.2% (1%) as a share of GDP. Non-financial corporations gained 0.2% and 1.3% respectively¹⁵.

- *Losers* are financial corporations and households (savers). For financial corporations, the losses due to the low-interest rates amounted to -0.2% and 1.5% respectively in the periods mentioned above. Households, on average in the Euro area had a loss of 0.1% and 0.2% respectively¹⁶.

As already in the case of the OMT programme (Outright Monetary Transactions), announced on 2 August 2012, also the expanded asset purchase programme (APP) which the ECB started in March 2015 is part of a legal dispute before the German Court of Justice (Bundesverfassungsgericht; BVV, 2017). The complainants (Bernd Lucke, Peter Gauweiler, and Markus Kerber.) argue that the APP, in particular, the PSPP violates the prohibition of state finance according to Article 123 TFEU and breaches the no-bail out clause of Article 125 TFEU. On, 18 July 2017, the BVV suspended its judgment and asked 43 questions to the European Court of Justice (ECJ). Behind the complaint there are many concerns, partly also shared with the German Bundesbank. As we already stated, the APP has not reached its primary target, namely to reach the inflation target of 2%. However, it had several unintended effects. In a letter to the BVV, president Jens Weidmann of the Bundesbank listed a series of undesirable side effects of the bond purchase programme which would increase and accumulate over time (see Rasch, 2017). A major concern is that PSPP would blur the borders of monetary and fiscal policy, the increased risk of financial market stability and negative effects on the capital markets. QE programmes should therefore only be applied in times of a crisis. According to the Deutsche Bundesbank and the ECB, the PSPP involves not very high credit risks. The end of the APP of the ECB (maybe starting in 2018) carries the risk of increasing interest burden for the state and credit consumers.

4. The unfinished EMU explains the growth gap

Neither a more aggressive fiscal and/or monetary policy would have closed the growth gap between the United States and the Euro area. Neither, the management of fiscal policy (very expansionary in the Great Recession 2009 and consolidation afterward) explains the growth

¹⁵ The Deutsche Bundesbank (2017) estimates that the ZLB policy helped the public sector to save interest payments over the period 2008-2016 cumulative of around 10% in Italy, Netherlands, Austria, France and Belgium; 7.5% in Germany, 6.5% in Finland, 6% in Portugal, 4.5% in Spain and 4.2% in Ireland. Greece is a special case. The rescue measures helped to reduce the interest burden considerably.

¹⁶ Rösl and Tödter (2017) estimate the losses of the financial repression for German savers at €65 billion per annum in the period 2010-2014.

difference because the USA followed more or less the same fiscal policy stance as the Euro area. What remains than an explanation?

The GFC not only caused a Great Recession, it was also the starting point for reforms in the financial sector in the industrial world, also initiated by the G7 and G20.

An intrinsic difference in the post-crisis economic performance on both sides of the Atlantic may be based on the institutional set-up of both regions. The United States has already a long tradition with the handling of financial crises. Their institutions, e.g. the Fed are more than hundred years old. After the GFC, the United States had more or less only to clean-up its financial sector problems via a rapid liquidating of failed banks and introducing a new regulatory framework (the Dodd-Franc Act) in order to avoid similar financial crises in the future¹⁷. The Dodd-Frank Wall Street Reform and Consumer Protection Act (Dood-Frank Act) was signed by President Barack Obama on 21 July 2010. After the cleaning of the financial sector of idle banks and the ongoing deleveraging process, the US economy could unfold its usual market-economy oriented strength and embark into a sustained recovery from the Great Recession of 2009.

In contrast, the Euro area, a subset of the European Union has a very short history. The Economic and Monetary Union (EMU) – legally based on the TFEU - is still an unfinished project of the European Union. Since its inception in 1999 and the introduction of the Euro in 2002, the Euro area performed quite successfully in the “nice weather period” until the outbreak of the GFC in 2007/08 (see Table 1 and Figure 1a). The EMU was not prepared for such a great shock as the GFC and the following Great Recession.

In response to the recent financial crisis, the European Commission pursued a number of initiatives to create a safer financial sector for the Single Market of the EU. These initiatives form a single rulebook for all financial actors in the 28 EU countries. They include (i) stronger prudential requirements for banks, (ii) improved protection for depositors, and (iii) rules for managing failing banks. Altogether this forms the plan for the creation of a European Banking Union (starting on 4 November 2014 with the Single Supervisory Mechanism – SSM; executed by the ECB; see Breuss, Roeger and in’t Veld, 2015) to regulate and stabilize the banking sector. The 19 members of the Euro area have to participate in the Banking Union, the other EU member states are free to participate. The next project is the Capital Markets Union (see European Commission, 2017). Besides that, the Euro (debt) crisis

¹⁷ In might well be that President Trump will “dismantle” Dodd-Frank and replace it with pro-growth policies (see Deloitte, 2017).

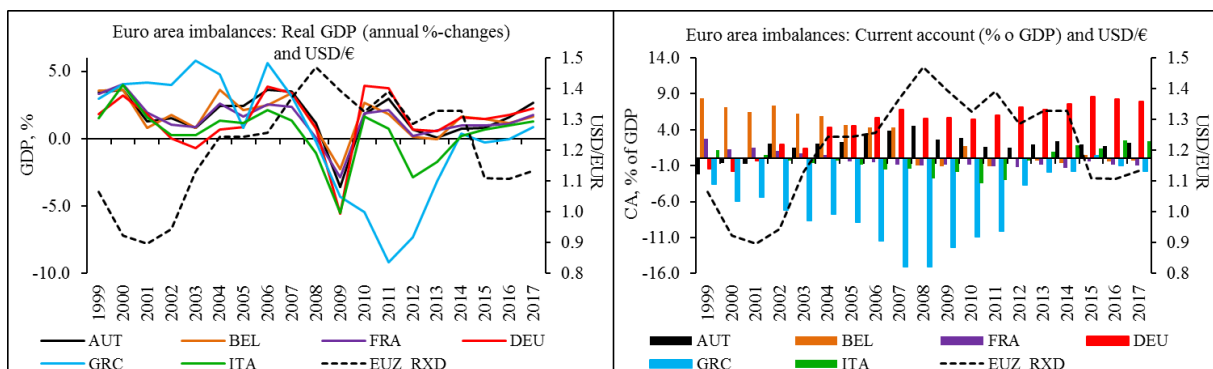
triggered significant institutional changes: (i) in the coordination of fiscal policy in the EMU (European Semester; reform of the Stability and Growth Pact; Six-Pact, two-pact; see Breuss, 2016), and (ii) the introduction of previously not existing rescue measures (EFSF, ESM) to “bail-out” Euro area countries (see Table A1 in the Appendix).

Nevertheless, the EMU project is still unfinished and the future of it is still far away (see European Commission, 2017).

4.1 Heterogeneity and the Euro corset

After the start of EMU, the financial markets cultivated the so-called "no bail-out illusion", meaning that buyers of government bonds from Euro area countries believed that the default risk of all countries belonging to the Euro area would be practically equal - namely zero. Only after the outbreak of the Euro (debt) crisis, triggered by implausible budget figures in Greece in late 2009, the financial markets (and rating agencies) realized the differences of country risks and began to rate the default risk realistically. Initially, this led to an overshooting of the spreads in yields of government bonds. Those of peripheral countries scored strongly upwards (most in Greece), while the core countries - particularly in Germany - even declined. The Draghi speech plus the OMT announcement ended this spook and resulted in a nearly realistic assessment of the risks of sovereign defaults by member states of the Euro area.

Figure 11: Imbalances in the Euro area: GDP, current account and the Euro: 1999-2017



RXD = USD/Euro exchange rate (increase is appreciation; decrease is depreciation of the Euro vis à vis the US-Dollar (right-hand scale)).

Source: Oxford Economics.

The Euro area consists of rather heterogeneous economies. The core is a group which is competitive (lead by Germany), the periphery did not properly adjust their wage policy to productivity and is therefore not competitive. Since its introduction, the Euro steadily

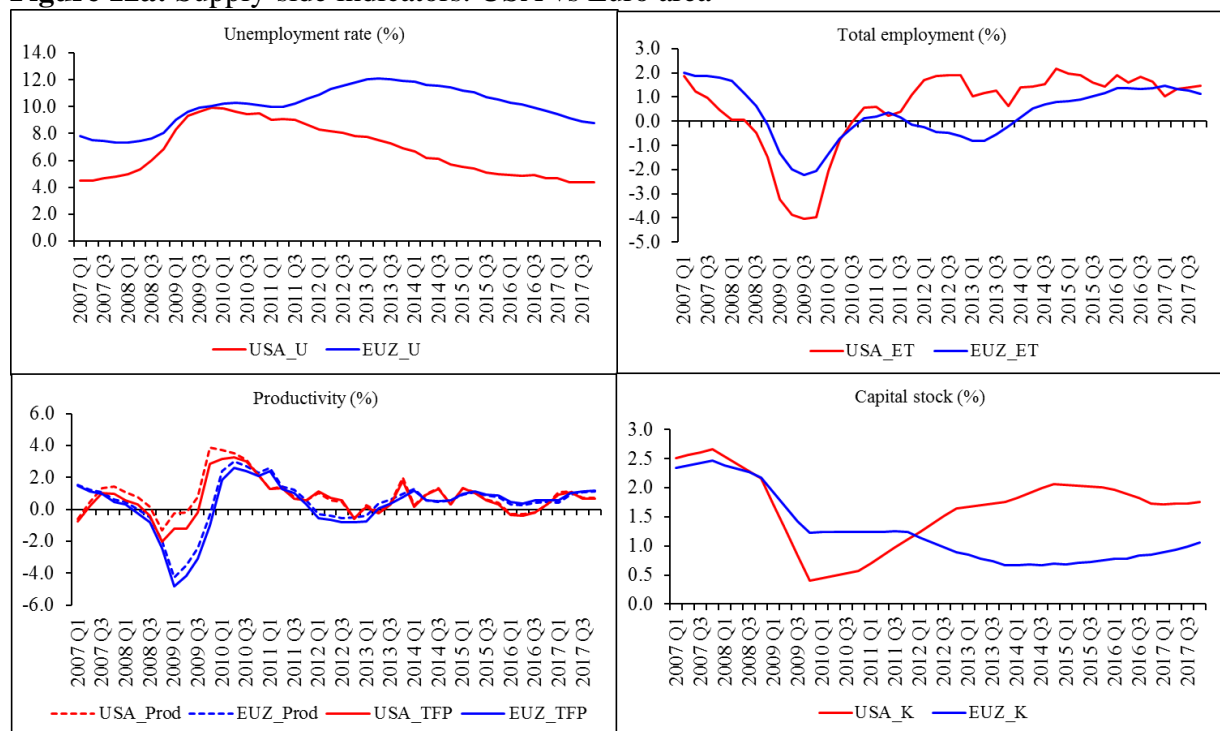
appreciated against the US dollar and caused a cumulation of imbalances in the current account balances in the Euro area: Germany improved its current account, the periphery countries (Greece in particular) deteriorated steadily. Only the drastic fiscal adjustment programmes with a dramatic fall in domestic demand and real GDP has led to a correction in the current account deficit in Greece (see Figure 11).

All in all, a precondition for a functioning Euro area project would be, that the Euro area countries would converge to something like a common (or “European”) business cycle. The most recent upswing in the Euro area is a good sign of improvement but cannot guarantee the catching up with the United States.

4.2 Supply-side weakness

The United States is not only more trained in dealing with financial crises because of a long tradition of the respective institutions. It also performs regularly better in the evaluation of the functioning of its market economy. Just taking “Doing Business 2017” (The World Bank, 2017): In the category “Ease of Doing Business” the USA ranks 8; the first Euro area country, Finland ranks 13, Germany 17 etc. OECD’s indicator of Product Market Regulation shows a similar picture. Most Euro area countries are much higher regulated than the USA and the UK (see Koske et al., 2015).

Figure 12a: Supply-side indicators: USA vs Euro area



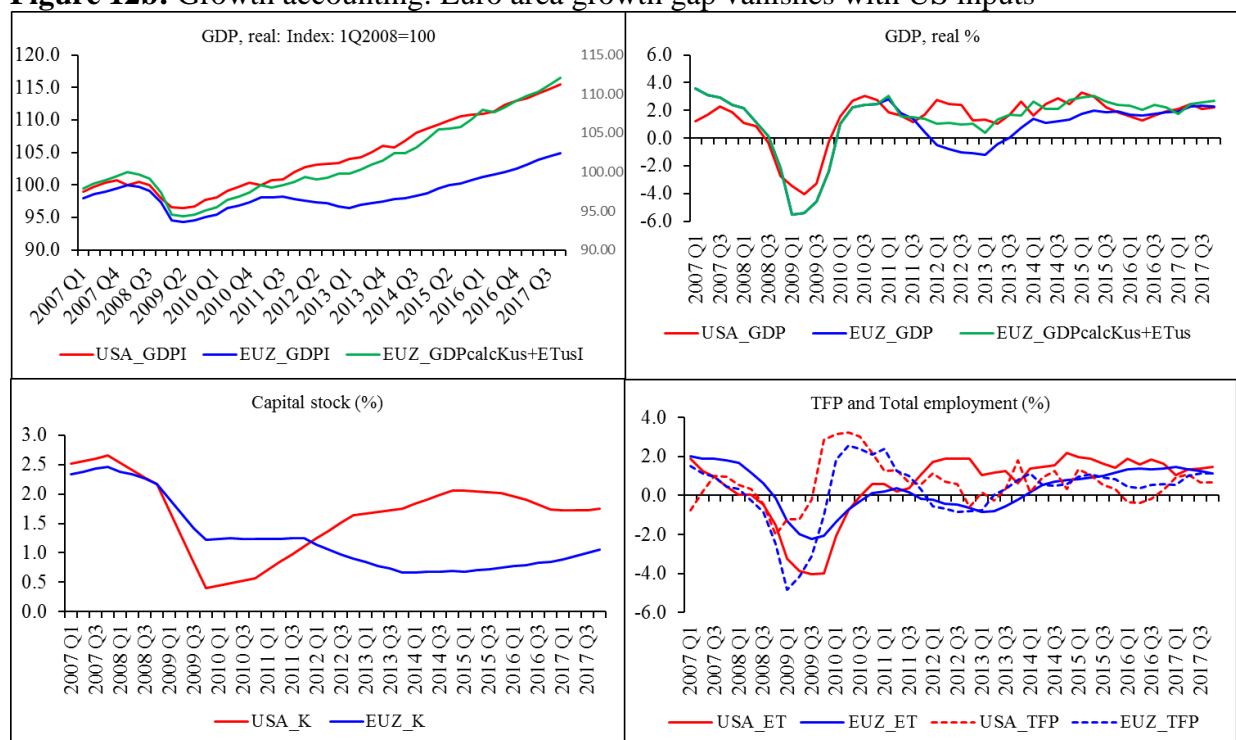
U = Unemployment rate (%); EUZ = Euro area; Prod = Labour productivity (GDP/employee); TFP = total factor productivity = $GDP/(K^{0.2} \cdot ET^{0.8})$; K = real capital stock; ET = total employment.
Source: Oxford Economics

The structural heterogeneity of the Euro area is also underlined by the very different roles of the Euro area member states in the Global Competitiveness Index 2016-17 Rankings of the World Economic Forum (2016). Whereas the USA ranks 3 (Switzerland 1, UK 7), the best ranked Euro area countries are: Netherlands 4, Germany 5, Finland 10, Belgium 17, Austria 19 and France 21. The periphery countries rank much behind the core countries: Ireland 23, Spain 32, Italy 44, Portugal 46, Greece 86 (Malta 40, Cyprus 83).

A look at the supply-side indicators reveals that the USA took its potential to overcome the crisis better than the Euro area by the following factors (see Figure 12a):

- A higher growth of productivity (labour and total factor productivity - TFP) during the Great Recession of 2009.
- A deeper decline of total employment and capital stock (investment) in 2009 but a higher growth performance in both production factors thereafter.
- This resulted in a much more favourable picture concerning the unemployment rate, starting with the same level in the recession of 2009.

Figure 12b: Growth accounting: Euro area growth gap vanishes with US inputs



Assumption: Real GDP growth is generated by adding to TFP growth of the Euro area the growth rates of US inputs (capital and labour) starting in 1Q2011: $EUZ_GDP_{calc} = TFP_{Eu} + 0.2 * K_{us} + 0.8 * ET_{us}$; K = real capital stock; ET is total employment.
Source: Oxford Economics

4.3 Simple growth accounting would solve the puzzle

A simple growth accounting exercise would indicate how the Euro area could have closed the growth gap with the USA. If one hypothetically calculates the growth rates of real GDP of the Euro area by adding to Euro areas growth of TFP the growth performance of total employment and the capital stock of the USA, one could “solve” the growth puzzle. Doing this exercise, starting in 1Q2011 – the beginning of the double-dip recession in the Euro area – the economy of the Euro area would have embarked on the same sustainable growth path as the USA (see Figure 12b).

6. Conclusions

Ten years ago, the global financial crisis (GFC) started to unwind in the USA and triggered the greatest recession since World War II. Although the GFC of 2007/08 was caused in the United States, their economy was not hit so hard in the Great Recession of 2009 as in the Euro area. The USA also recovered more rapidly and sustained from the crisis than the Euro area. Additionally, the specific Euro crisis of 2010 led to a double-dip recession in the Euro area, not joined by the USA. This divergent post-crisis development since then accumulated to a considerable growth gap between the USA and the Euro area. What are the factors behind this different performance? Would a more aggressive fiscal and/or monetary policy in the Euro area have closed the growth gap? As our simulation exercises show: the answer is no. However, the unconventional monetary policy by the ECB since 2014/15 contributed to the most recent recovery in the Euro area. We identify the pivotal reason of Euro areas growth lagging behind the USA in the different experiences in the crises management. The USA has a long-lasting experience in handling financial crises. In historical comparison, the Euro area - the Economic and Monetary Union (EMU) of the EU - is still a “teenager”. The crises revealed, that the legal basis of the institutional set-up of EMU and hence of the Euro area was not enough crises-proven. Rescue instruments had newly to be implemented. The GFC was the first great shock which was badly absorbed by the still quite heterogeneous member states of the Euro area. The Euro area, shattered by a succession of external (GFC, Great Recession) and internal (Euro crisis) shocks, could therefore not unfold its growth potential in

the last decade. If – hypothetically – the Euro area would have profited from the faster-growing production inputs (capital and labour) as in the USA, the growth gap could have been closed.

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Appendix

Table A1: Rescue programmes for five Euro area countries: 2010-2017

	Time span	IMF EUR bn	EFSM EUR bn	GLF EUR bn	Bilateral EUR bn	EFSF EUR bn	ESM EUR bn	Total EUR bn
Cyprus I	12/2011-12/2012			2.5				2.5
Cyprus II	5/2013-3/2016	1.0					6.3	7.3
Greece I+II	5/2010-6/2015	32.1		52.9		141.8		226.8
Greece III	8/2015-8/2018						39.4	39.4
Ireland	10/2010-12/2013	22.5	22.5		4.8	17.7		67.5
Portugal	5/2011-6/2014	26.4	24.10			26.0		76.5
Spain	7/2012-12/2013						41.3	41.3
Total		82.0	46.6	55.4	4.8	185.5	87.0	461.3

EFSM = European Financial Stabilisation Mechanism (European Commission),

GLF = Greek Loans Facility (bilateral loans from Euro area member states),

EFSF = European Financial Stability Facility

ESM = European Stability Mechanisms

Sources: ESM Website: <https://www.esm.europa.eu/> and ESM (2017).