

Monetary policy implications of transitory vs. permanently subdued growth prospects (“secular stagnation”)

Monetary Dialogue November 2018



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Abstract

Since the start of the global financial crisis, per-capita income growth has stagnated in many advanced economies. Some scholars have interpreted the lack of growth as a temporary phenomenon caused by the legacy of the crisis. Others view the lower long-term growth as a consequence of an unfavourable evolution of the productive inputs (labour and capital) as well as of productivity.

Against this background, the current paper examines the long-run evolution of the euro area economy, and suggests some causes for this low-growth phenomenon.

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LIST OF ABBREVIATIONS

| | |
|----------------|---|
| CB | Central Bank |
| CE | Credit Easing |
| EA | Euro area |
| ECB | European Central Bank |
| NPL | Non-performing Loan |
| OMFI | Other Monetary and Financial Institutions |
| QE | Quantitative Easing |
| R&D | Research and Development |
| TFP | Total Factor Productivity |
| US | United States of America |

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EXECUTIVE SUMMARY

Despite unprecedented monetary expansion and supportive fiscal policy, per-capita income growth has stagnated in many jurisdictions, including the euro area. Some economists have interpreted the lack of growth as a temporary phenomenon, with growth rates expected to resume to their pre-crisis trend once the current debt overhang is absorbed. According to an alternative explanation, lower long-term growth is a consequence of an unfavorable evolution of the productive inputs labor and capital as well as of productivity.

Depending on whether this is a temporary or permanent phenomenon, the implications for monetary stance are decisive. Should the current low growth momentum be mainly a transitory circumstance, central banks' could go back to standard monetary policy tools (price-stability target for the ECB). By contrast, should most advanced economies face secular stagnation, keeping policy rates at or close to the zero lower bound could become the new "normal" for central banks. Lower equilibrium rates provide less room for monetary policy to operate without being constrained by the effective lower bound. Consequently, this increases the likelihood that other monetary instruments and targets will be required to counteract future recessions.

The evidence put forward in this paper suggests that the current downturn is a permanent phenomenon. The fundamental changes in the economy began in the 1990's, but surfaced during the latest crisis when the financial system became impaired. **On the supply side**, productivity has consistently decreased over the past decades, and for the first time since the post-war period, total factor productivity was not the dominant factor pushing the US economy out of the recession as it grew less than at any point since 1961. Moreover, while the unemployment in the US is at its lowest level for decades, the hourly earnings are much below the 2008-level, and within the lowest quintile since records began in 1960. For the euro area, the unemployment rate is significantly higher at the same time as unit labor costs and wages remain below the trend (and in recessionary interval). **On the demand side**, private consumption and investment are well below the long-run trend. In the case of the US, it is even more concerning since private expenditure has been stagnant since 2008, but is commonly considered the 'first signal' of a recovery. The result has been a serious risk of deflation, which despite the heavy monetary and fiscal artillery has not been fully eliminated in most developed economies.

This is a result of the transformation in the relation between the financial sector and the macroeconomy. Not only have these become notably tighter over the past 20 years, but their mutual impacts have also become deeper. Besides the debt overhang restricting any potential recovery in the economy, the enormous increase in the size of the banking-and financial industry over just 20 years has pulled the resources from the rest of the economy. Since the recovery in the financial sector has been slow and anemic, the usage of those resources is therefore well below the optimal, and as a result it is dragging the economy. Any resource re-allocation to other sectors of the economy is slow and costly. Moreover, it is dependent on credit availability to all productive sectors, which remains well below the desired levels despite the high liquidity in the banking system. Meanwhile, the demographic shift in the working population across the advanced world has led to a shrinking labour force, working age population, and a bigger social welfare load. Combined with the automation that is occurring in some traditional productive sectors while in others there is a technological crowding out of the labor force, aggregate labor productivity is expected to remain low for a longer period of time at the same time as the growth in household disposable income declines.

In this environment, the monetary policy targets need to adapt to take into account these structural challenges. Moreover, the available set of monetary instruments needs to be broader than under conventional monetary policy to help (re)anchor the expectations. The monetary measures need to

be complemented by a coherent and systematic package of policies involving structural and welfare-oriented measures to guide through the fundamental adjustment process while providing protection to the working population.

Questions for the Monetary Dialogue

- Considering that Japan has stubbornly remained in the low growth scenario for the past two decades, and that many of their characteristics are currently shared across other advanced economies, are we facing a similar prospect? If not, what makes President Mario Draghi believe that euro area is different?
- Consensus regarding the presently conventional monetary policy was built during a period of high monetary volatility and the Great Stagflation. However, the economic structure has profoundly changed since then and challenges that the advanced economies currently face are very different. How should monetary policy take this into account? Do you expect consensus on the conventional amongst central banks to transform during the foreseeable future?
- How much of the anaemic performance over the past decade in the euro area can be attributed to internal imbalances, and how much to imbalances and shocks imported from elsewhere, in particular the US?

1. INTRODUCTION

Since the start of the global financial crisis and despite unprecedented monetary expansion and supportive fiscal policy, per-capita income growth has stagnated in many jurisdictions, including the euro area

Some economists have interpreted the lack of growth as a temporary phenomenon caused by the legacy of the crisis, with growth rates expected to resume to their pre-crisis trend once the current debt overhang is absorbed. According to this view, the observed weakness in productivity growth is due to efficiency issues, which are slowing adoption and diffusion of new technology. The efficiency with which labor and capital are combined to generate output partly depends on the extent to which firms operate in an institutional, regulatory and legal environment that fosters competition, avoids unnecessary administrative burdens, provides modern infrastructure and access to capital. Conditioned by the financial crisis, market dynamism has weakened considerably, putting a drag on productivity growth.

According to an alternative explanation, lower long-term growth is a consequence of an unfavorable evolution of the productive inputs labor and capital as well as of productivity. Key driving factors are an aging population and a shrinking labor force, the declining share of working-age population, in turn depressing investment demand and keeping real interest rates low related to the global excess of savings over profitable investment. In turn this could signal subdued growth rates going forward, so-called “secular stagnation”.

The assessment of long-term growth trend has relevant implications for the monetary stance. Should the current low growth momentum be mainly a transitory phenomenon, central banks’ could go back to standard monetary policy tools (such as the ECB price-stability objective by managing policy rates). By contrast, should most advanced economies face secular stagnation, keeping policy rates at or close to the zero lower bound could become the new “normal” for central banks. Indeed, low output growth means real equilibrium interest rates will also be low. Lower equilibrium rates provide less room for monetary policy to operate without being constrained by the effective lower bound. This in turn reduces the likelihood that non-standard measures will be required to counteract future downturns.

Against this background, this paper examines the long-run relations in the euro area, the US, and other advanced economies. The objective is to understand the stagnation phenomenon and provide plausible explanations for its present occurrence. The implications for future monetary stance will also be considered, in particular in relation to a possible reversal to conventional monetary policy.

2. LONG-RUN PATTERNS IN THE EURO AREA ECONOMY

The euro area economy has undergone remarkable changes over the past decades. Besides the formal establishment of the Single Market and the Monetary Union, the role of the banking- and financial sector has greatly increased since 1990s. While this paper will not discuss the degree of convergence or divergence between the euro area Member States, it is implied that the developments in the euro area are a result of the structural developments in the member economies. Notwithstanding, the data compiled and analysed in this section treats euro area as a single entity.

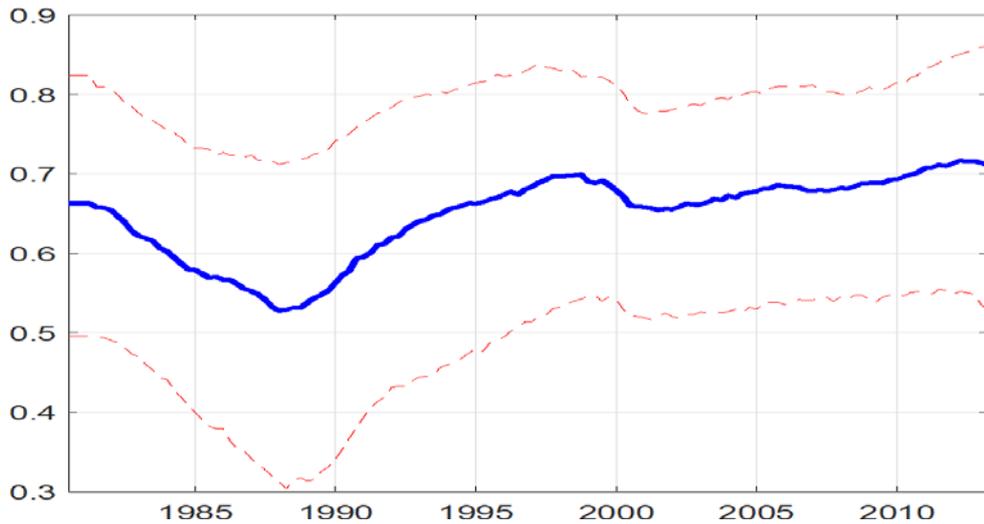
2.1. Interplay between macroeconomic and financial cycles

It has long been debated whether the interplay between the financial sector and the rest of the economy has increased since the early days of financial liberalisation in the 1980’s. However, there are very few studies published precisely on this topic, in particular for the euro area. In most of the studies so far (Artis et al, 2005 ; Gianonne and Reichlin, 2005 ; Dees et al, 2007 ; Claessens et al, 2011 ; Ciccarelli et al, 2012 ; Gianonne et al, 2012, 2014) the authors examine the interaction between business and credit cycles. In general, they do not find strong evidence for an increased synchronization between the two, and do not find that financial shocks matter for the macroeconomy. In Giannone et al (2012, 2014) the authors find unusual dynamics for longer-term loans, deposits and longer-term interest rates, but without further insights into the causalities.

A very recent study by Gerba and Leiva-Leon (2018) has estimated and examined this degree of interactions using more thorough definitions of macroeconomic and financial cycles. In their paper, the cycles are constructed pulling information from 29 variables on stocks, flows and prices, and their individual weights are allowed to vary over time such that the cycles are updated in each time period. The authors find that the correlation between the two cycles has increased considerably since the 1990’s (Figure 1). It grew from just above 0.5 in the late 1980’s to above 0.7 at the end of the sample. Moreover, the upward trend at the end of the sample suggests that the correlation had continued to increase after 2014. Considering that a correlation coefficient of 0.9 or above is considered to signal (almost) perfectly correlated series, the two cycles have become highly synchronised over the past decade. Furthermore, from Figure 2 it is clear that financial cycles are, on average, longer, more volatile, but less erratic than macroeconomic cycles. Yet, despite those differences in their statistical properties, the correlation is very high.

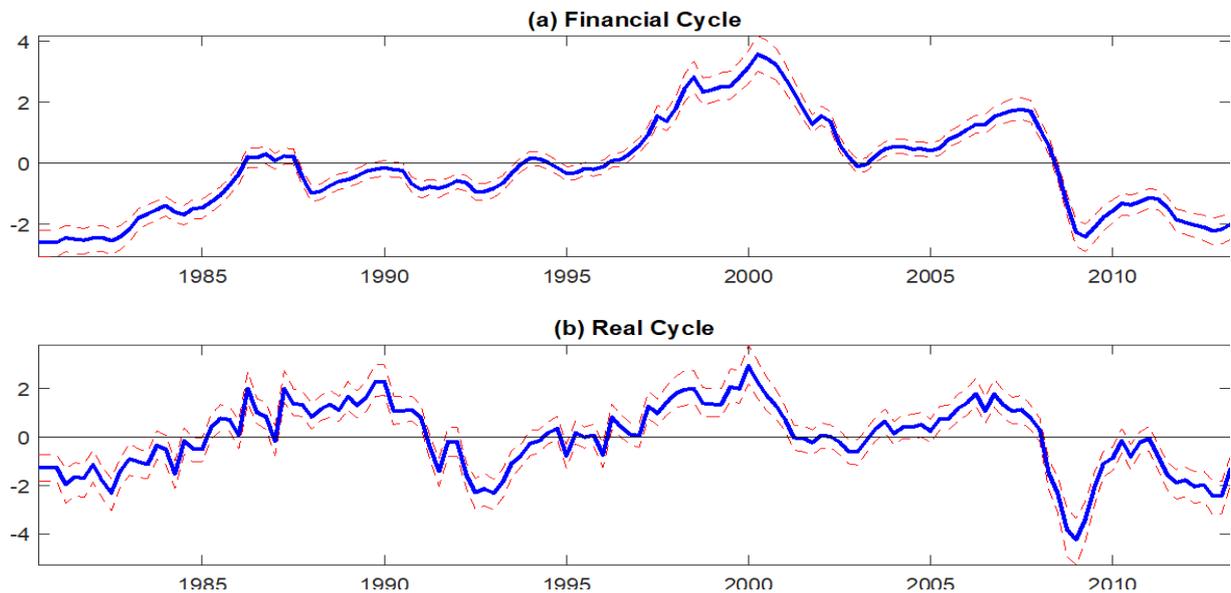
Focusing on the last quintile in Figure 2, it seems that the two cycles have been much below the trend ever since the 2008 crises. On average, the financial cycle seems to be slightly below the macroeconomic cycle since the start of the recession, while their correlation appears to be almost perfect. Gerba and Leiva-Leon (2018) run a number of estimations and counterfactual exercises and find that there are strong mutual feedbacks between financial-and real sectors, and that the magnitude of these cross-impacts has more than doubled over the past two decades. Likewise, they find that financial shocks have caused (relatively) higher impact on the macroeconomy since mid-1990’s while during the same period, the persistence in the transmission has been higher for macroeconomic shocks. Taken together, this suggests that there is an important feedback loop between the two sectors, which can explain the prolonged current downturn. The initial shock was generated in the financial sector, which caused a severe macroeconomic downturn. However, the downturn was so heavy that it sent negative prolonged disturbance to the financial sector, causing a delay in financial sector recovery, and so on.

Figure 1: Time-varying correlation between macroeconomic and financial cycles (1980-2014)



Source : Gerba and Leiva-Leon (2018).

Figure 2: Evolution of euro area financial and macroeconomic cycles between 1980-2014



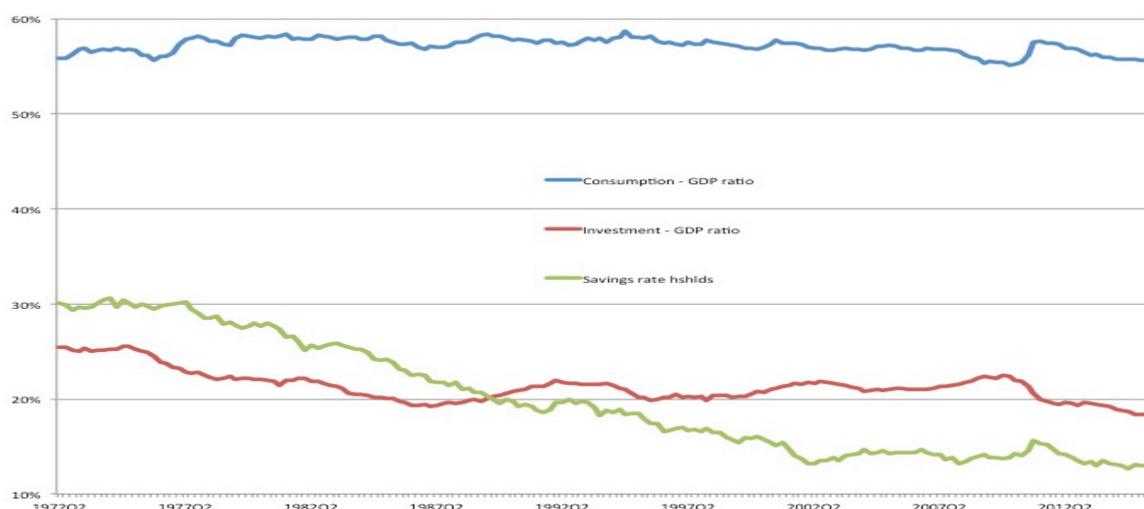
Source : Gerba and Leiva-Leon (2018).

2.2. Long-term macro-financial (great) ratios

A complementary way to examine the long-run is to look at the progress through time of macroeconomic and macro-financial ratios. Gerba et al (2017a) do this in a recent paper using 4 decades of macroeconomic and financial data. Figure 3 reports the evolution of the consumption-GDP (blue), investment-GDP (red), and savings-GDP (green) ratios. Figure 4 reports the progression of real GDP (blue), bank liabilities-GDP (red), and saving deposits-GDP (green). First, consumption is two-to-three times as large as investment or savings in the euro area. Moreover, consumption share of GDP has remained constant meanwhile that of investment and savings has consistently decreased

since 1972. By 2012, both shares were below 20%, which is almost a third of that of consumption. Yet since 1990, savings have been below investment, and at peak, the difference was almost 10%. Highly positive interest rates may be able to re-balance some of this wedge, although it relies on the important assumption that savings have secularly declined because of the decreasing interest rate trend since the 1980’s (Krugman, 2014). If the reasons lie elsewhere, such as a lack of supply of safe assets (Caballero and Fahri, 2014), weak employment perspectives (Glaeser, 2014), or weak balance sheets (Koo, 2014), then simply increasing the interest rates will be far from effective.

Figure 3: Great macroeconomic ratios (1972-2014)

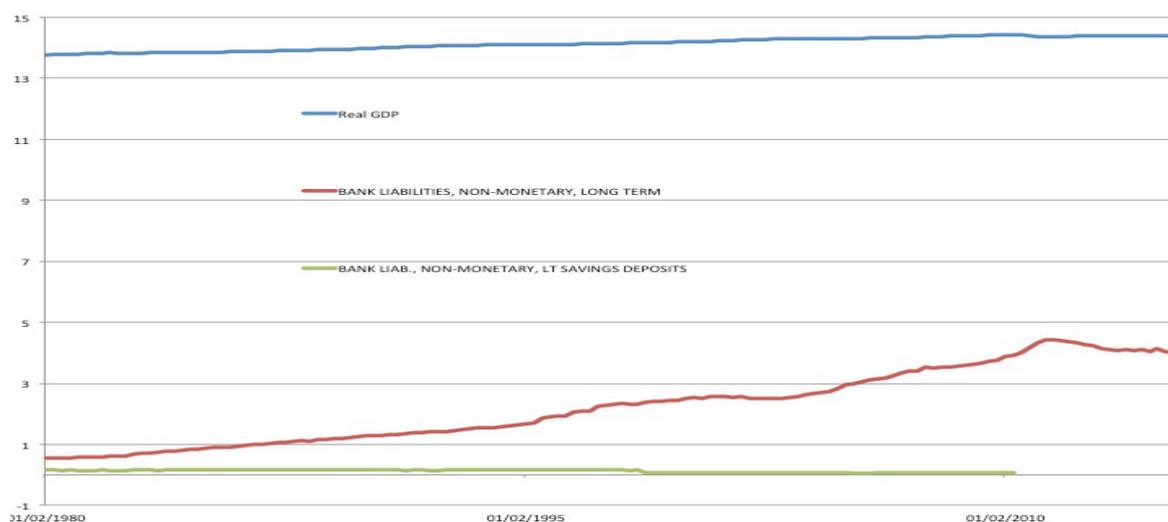


Source : Gerba, Henry, and Zochowski (2017).

During exactly the same period, liabilities-GDP experienced a tremendous growth of around 900% in only 30 years. In 1980, it was 50% of GDP, while at the start of the Great Recession it had accumulated to 450%. More narrowly, bank liabilities were at par with GDP around 1990, while they grew 4-fold during the subsequent 20 years. Hence, it is very possible that some of the investment-savings wedge was financed by this tremendous financial expansion. Still this expansion in bank liabilities did not come from savings deposits. Those, on the other hand decreased over time, from 15% of GDP in 1980 to 6% in 2010. This implies that the growth impetus came from inside the financial sector, or from outside of the euro area. Considering that modern universal banks create deposits when issuing loans and securities, finance other banks, or raise liquidity from the non-bank financial segment, it is highly likely that this increase has come from within the financial sector.¹ In other words, the financial sector has accomplished to grow endogenously while supporting growth in real sector activities beyond the standard real balances or equilibrium, such as investment in respect to savings.

¹ Unfortunately, the authors were not able to retrieve long-term series on the liability composition of banks.

Figure 4: Great macro-financial ratios (1980-2014)



Source: Gerba, Henry, and Zochowski (2017).

2.3. Other cyclical patterns

Gerba et al (2017b) perform an equivalent analysis on the cyclical frequency of the macro-financial data. They compare the pattern of a number of financial data, including balance sheets, quantities and interest rates, and compare it to the general business cycle over 6 full cycles.

Broadly speaking for the financial sector, it appears that depository institutions provide (limited) loans during upturns, while OMFI (other banks in particular) satisfy the remaining credit demand during downturns. Likewise, it appears that an increasing share of bank's funding has come from short-term non-depository sources (including shadow banks) since the 1990's. Data on interest rate (financing) spreads confirms this pattern.² Also cycles of bank capital and reserves have become more synchronized with the business cycle (having been negatively correlated previously), which means that since 2000's banks have become more exposed during downturns. Taken together, this implies that euro area banks have increasingly relied on highly procyclical non-traditional funding sources, which allows them to quickly expand their lending during booms, but leaves banks short and without sufficient reserves during recessions, forcing them to severely cut their lending.

On the firm financing side, the authors find a tighter link between firm balance sheet and the stock markets over the past two decades. Firms have increasingly relied on stock markets for general asset valuation since more firms are listing themselves (*asset channel*), firms use their equity as collateral for bank lending (*net worth channel*), and more firms can raise equity on the stock markets (*liability channel*). This progress has left the corporate sector highly exposed to (stock) market movements.³

² While both short and long-term spreads are procyclical and less volatile than output, the long-term ones are less procyclical and volatile than the short-term ones. This means that long-term financing is a more stable source of funding, but also less attractive during upturns, when the short-term funding becomes cheaper.

At the same time, the increased procyclicality of deposit rates has led to a reduction in attractiveness of depositing money during downturns since the reward for depositing has largely dropped.

³ The business confidence indicator is another measure confirming this pattern. The indicator has become twice as procyclical since 1990's at the same time as 50% less volatile. This points towards a strong business cycle driven sentiment in the corporate sector since late 1990's/early 2000's.

Overall, there has been an important shift in the financial structure and the financing model of the euro area, which has led to important structural changes in the economy. Firms have become tightly interlinked with the stock market, while the business model of financial institutions has changed. High reliance on short-term non-deposit financing allows banks to expand their lending during booms, but leaves them short and without sufficient reserves during recessions, forcing the banks to severely cut their lending.

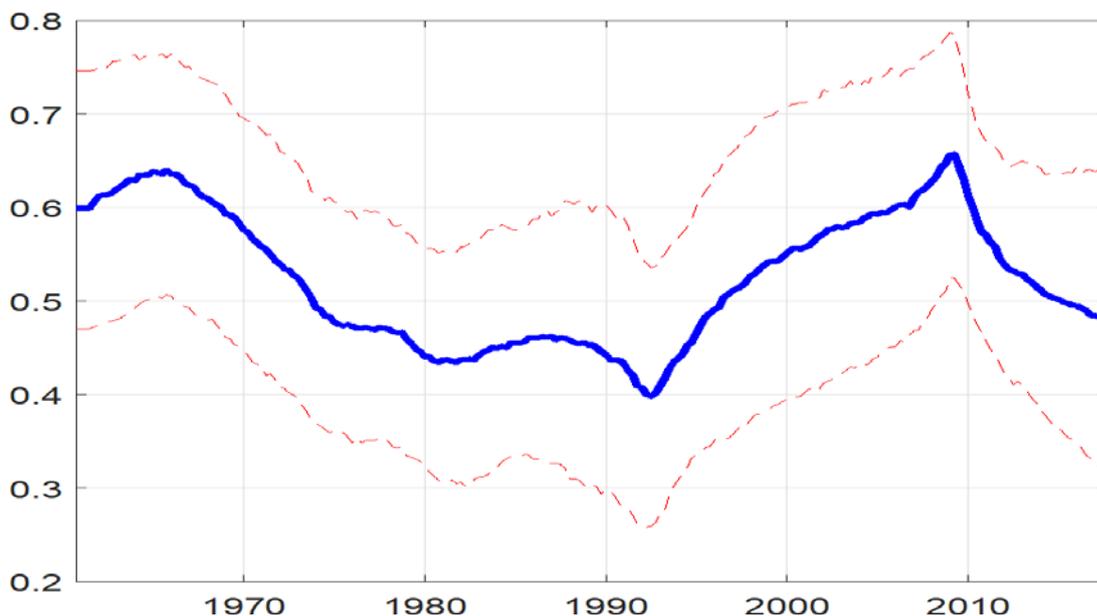
3. LONG-RUN PATTERNS IN THE US ECONOMY

Just as the euro area, US economy has also undergone fundamental changes over the years. In particular, the expansion in the financial sector and the increased pull of resources from the real economy has resulted in an increased interdependence between them. The following subsections will exhibit this change.

3.1. Interplay between financial and macroeconomic cycles

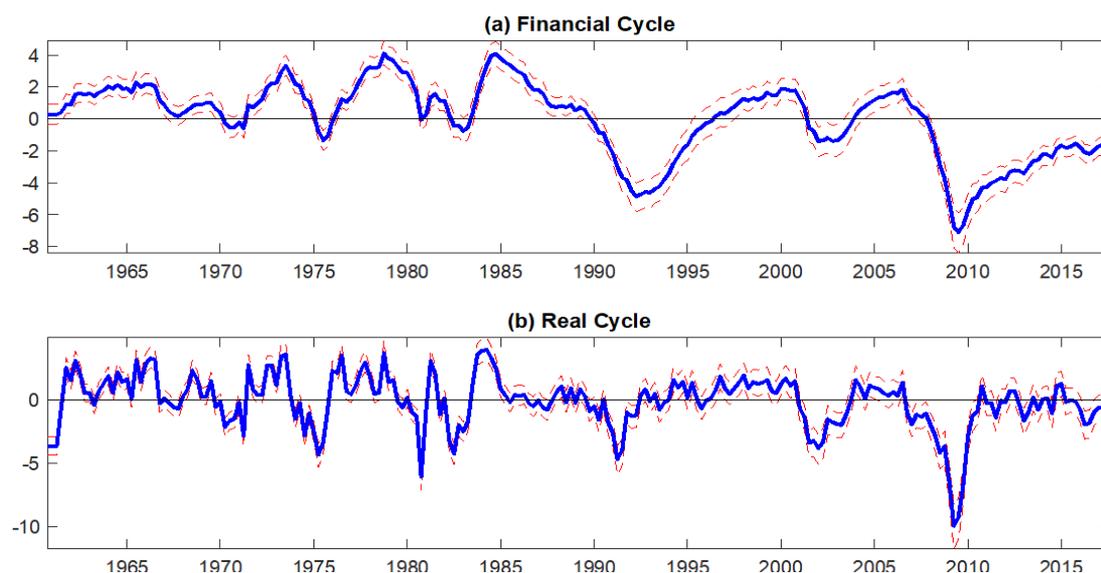
Figure 5 depicts the time-varying correlation between financial and macroeconomic cycles. The first noticeable observation is that the correlation in itself appears to be cyclical. The two peaks of around 0.65 in correlation occurred in mid-1960's and just at the onset of the Great Recession. Second, while the decline in the synchronisation was gradual and lasted for almost 3 decades (1965-1993), the recovery of it was twice as quick, in only 15 years (1994-2009). This means that the necessary tectonic shifts were so fundamental and quick that the result became an increase in correlation by 26 units, or 65%. Even in relation to the euro area, this growth was much sharper. However, the correlation coefficient in the euro area has consistently been above that of the US during the majority of the time period.

Figure 5: Time-varying correlation between macroeconomic and financial cycles (1960-2018)



Source : Gerba and Leiva-Leon (2018).

Figure 6: Evolution of euro area financial and macroeconomic cycles between 1960-2018



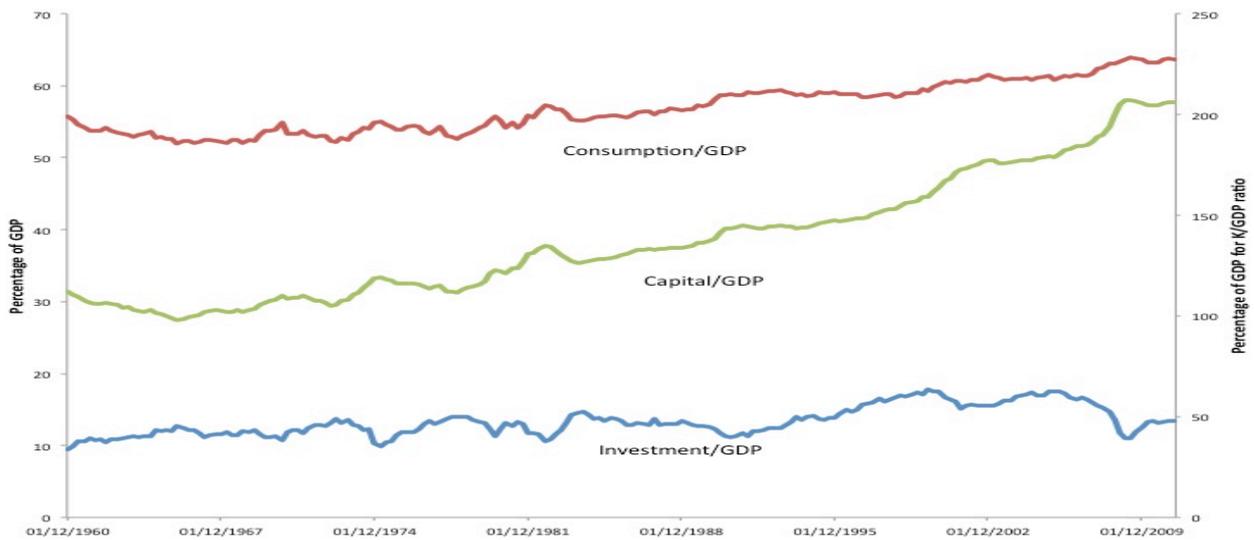
Source: Gerba and Leiva-Leon (2018).

In terms of their characteristics (Figure 6), the two cycles have the same pattern as in the euro area although the range of fluctuation of both is higher in the US (in particular around the Great Recession). Yet, as in the case of the euro area, the synchronicity between the financial and macroeconomic cycles seems very high. The financial sector is underperforming even 10 years after the initial contraction, and seems to keep the macroeconomy from recovering, which remains within the recessionary band. So the financial sector imparity is dragging the rest of the economy.

3.2. Long-term macro-financial (great) ratios

Contrary to the euro area, investment-GDP ratio in the US has remained stable during the post-war period while that of consumption-GDP has increased by more than 5% (Figure 7). While consumption share of GDP is close (and slightly higher) to that of the euro area, the investment share is considerably smaller. Even if one takes into account the lowest level in euro area investment-GDP ratio achieved in 2016 (18%), it is not as small as in the US that oscillated between 10 and 18% between 1960 and 2014. In other words, while investment and savings have declined in euro area, growth in US consumption had outpaced that of GDP, in particular since 1990.

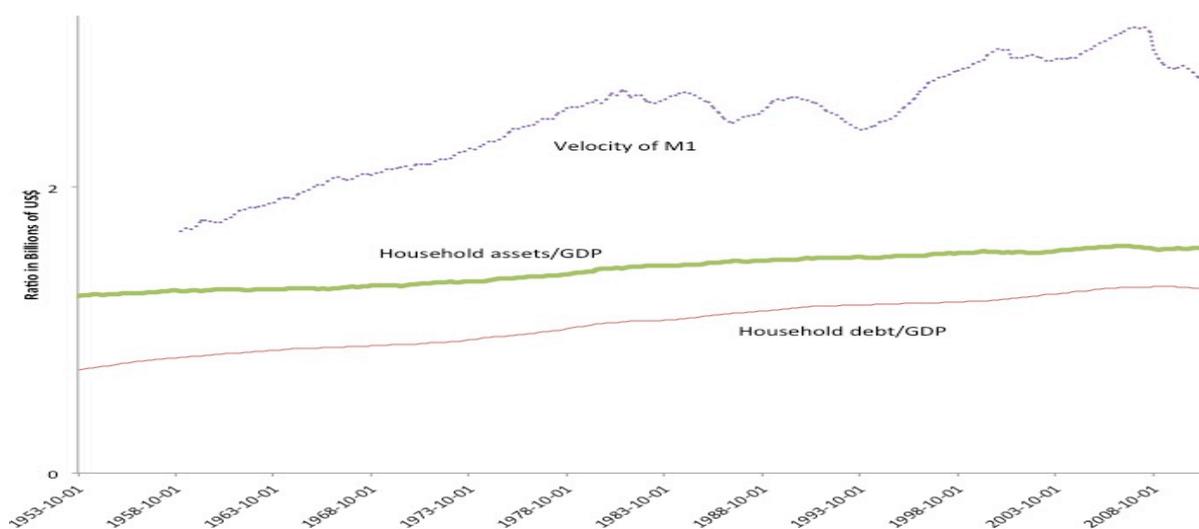
Figure 7: Great macroeconomic ratios (1960-2014)



Source: Gerba (2015).

A closer look at the balance sheet of households provides some insight into how this consumption growth may have been financed. Figure 8 depicts the evolution of household asset-GDP (green) and household debt-GDP (red). First, both assets and debt grew faster than GDP in the post-war period. Second, household total assets were already in 1953 larger than the GDP. Third and most important, household debt has grown quicker than household assets during this period. In other words, equity of households has shrunk while indebtedness has increased to such an extent that the wedge between assets and debt has halved to around 20% just prior to the Great Recession. Connecting with the previous observation on US great ratios, it appears that the increase in US private consumption had been achieved through higher indebtedness, and not higher net worth or assets as standardly may be assumed. Thus again we observe how financial expansion and transformation has resulted in shifts in the real economy. In this case, however, it appears on the household-consumer side.

Figure 8: Great macro-financial ratios (1953-2014)



Source: Gerba (2015).

4. OTHER DEVELOPMENTS IN ADVANCED ECONOMIES

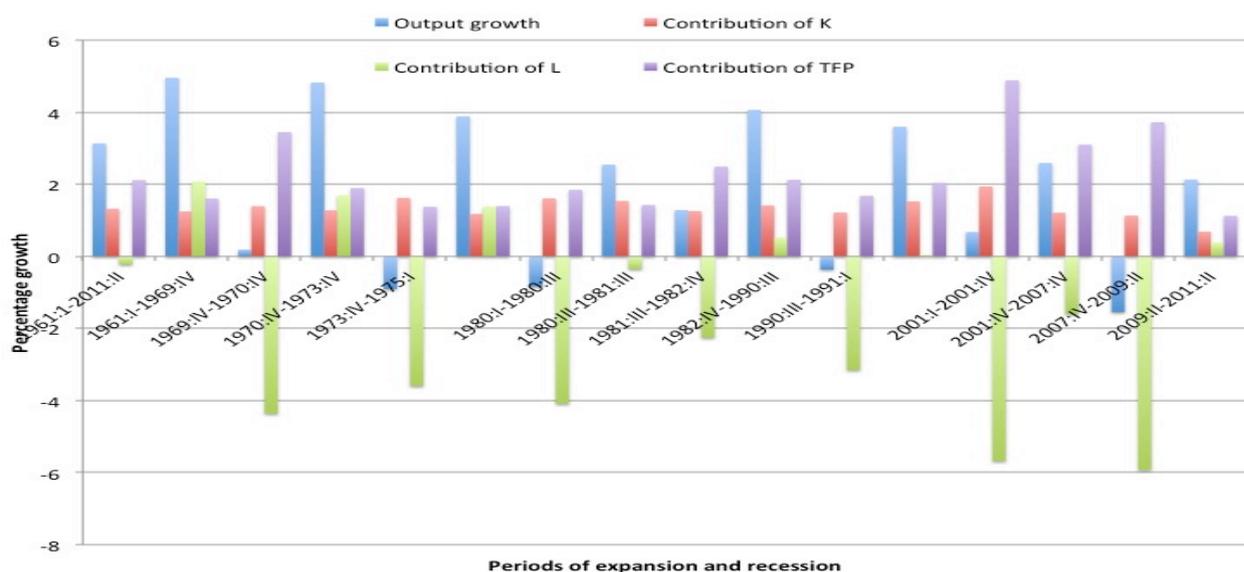
Simultaneously a number of other long-run transformations have occurred in most advanced economies. While they are not novel insofar that they have unexpectedly appeared at a particular point in time, they have just recently been covered by the academic literature. Their progress has been gradual, but their effects have only recently been measured. The topics include: a decline in productivity, reduction in labour force and rise in aging population, labour crowding out, and a deterioration in income growth for the vast majority of the population. This discussion is not intended to be exhaustive, but rather a summary of some of the key findings.

4.1. Productivity stagnation

Gordon (2014a, 2014b, 2015) was the first one to put forward an explanation for the long-run decline in output growth resulting from imbalances on the supply side of the economy. In particular, he points to demographics, education, inequality, and government debt as the main headwinds and causes of the slowdown in US GDP for the next 25-40 years (Gordon, 2015). His argument implies that potential GDP will stagnate despite improvements in unemployment over the recent years, rather than real GDP being below its’ potential. Note, however that in his hypothesis he does not claim that technological progress will decline, but rather the opposite. He believes that technological progress will continue to grow at the same pace as during the last 40 years, but due to a lack in growth in the other factors, the technological progress will not succeed in translating into a full productivity growth.

Indeed some of the slowdown in TFP growth has already appeared. A long-run supply side business cycle decomposition of US GDP since 1960 done by Gerba (2014c) shows that TFP has had historically the smallest growth in 2009-2011, and was not the dominant factor pushing the economy out of the recession in 2010 (Figure 9). As a matter of fact, TFP growth was only around 1% between 2009-2011, while that of capital and labour was just below it. Gordon (2014c) reaches a similar conclusion in his analysis of TFP growth for 12 decades between 1890-2012, and finds that only during the decades of 1910 and 1980 has TFP growth been lower than that of 2012 (2000-2012). Now, if one takes away the boom years of early 2000’s and just leaves the period from 2007 onwards, it is almost certain that TFP growth over the past decade has been historically the lowest in over a century.

Figure 9: Supply side US business cycle decomposition (1960-2011)



Some researchers (Mokyr, 2014; Brynjolfsson and McAfee, 2016) have argued that a large share of this slowdown in TFP growth will be compensated by the increase in technological progress including artificial intelligence, robotics, machine learning, etc. The first problem with this is that we can't yet estimate the impact of those on (expected) TFP, or the impact of it on other factors of production (whether it will be crowding in or crowding out). Second problem is that in a context of high income and wage disparity between households and labour force, this technological change may not resolve the issues in labour input (compensation). According to Gordon (2014c), growth in real disposable income of the bottom 99% of the distribution is estimated at 0.2% per year over the coming two decades. To put the number into perspective, growth in real GDP per capita (of the entire US population) is expected at 0.9% during the same period, while the average for the 1981-2007 interval was 2%. In such setting, conventional monetary policy can't influence this imbalance since it relies on the assumption that the productivity imbalance (or liquidity trap) is temporary and that there is no severe supply side impairment.

4.2. Shifts in demographic distribution

One of the causing factors that have been most debated in the literature is the shift in the demographic distribution and the aging population. The consequence is a smaller labour force and a higher social welfare capture. The average population age in the advanced world has increased a lot, while those remaining in the labour force has shrunk. At the same time, the productivity of the aging labour force will decrease, while excess savings are built up. Recently, in a model of Eggertson and Mehrota (2014), the authors show how a drop in population growth generates a persistent (or permanent) slump in employment without a self-correcting mechanism. The effects of such a development would be, as Gordon describes, a drop in labour productivity and stagnation in TFP growth. This may result in significant rise in savings, which cannot be put to productive use (unlike investment).

Whether this will have structural effects on future GDP growth depends on the capacity of other factors to compensate for this slowdown. In particular, whether the debt overhang can be resolved and the financial sector can accelerate again, whether skilled migration can resolve some of the labour force gap, whether there is a prospect of a 'new social contract', or the ability of technological progress and automation to compensate for (some of) the losses in TFP slowdown. Yet, relying on technological progress to resolve this problem may be problematic on its own as it may crowd out some of the already shrinking participation and labour force.

4.3. Technological progress and crowding-out of labour

In light of the weak employment recovery in Europe since the Great Recession, there has been an increasing concern that technological progress may be reducing employment levels in advanced economies. Most studies separate between the complementary technology that augments labour productivity, and that which crowds out labour. One could think of the first group as technology that complements the activities of labour, making them more productive and thus expanding the demand for them. The other group can be thought of as substitutes, where technology absorbs the tasks of labour leading to a reduction in employment levels. Automation is believed to be a prime example of such activity where manual labour and routine tasks are substituted away for machines (Dachs, 2018).

While all existing studies find stronger effects on low-skilled workforce, the real debate lies in the impact on aggregate employment. Studies such as Piva and Vivarelli (2017), Witte (2017) and Dachs (2018) find that the impact on low-skilled labour is significant, and are concerned that this will create significant unemployment unless drastic policies are undertaken. Piva and Vivarelli (2017) also find

that the impact of R&D friendly expenditures mainly show-up as beneficial to workers in the medium- and high tech sectors, leaving low-skilled labour unprotected.

On the contrary, Acemogul and Restrepo (2017) found that the introduction of robots shrinks the US workforce by a ratio of one new robot to seven employees during the period 1993-2007. Chiacchio et al (2018) use the same model to estimate the impact in Europe and find that each additional robot per thousand workers reduces the employment rate by 0.16-0.20 percentage points. Ford (2016), Brynjolfsoon and McAfee (2016), and Piva and Vibvarelli (2017) also find significant aggregate employment effects from automation. Frey and Osborn (2017) take this task even further and predict that 47% of all jobs in the US will be at risk of being taken over by intelligent machines in the next 10-20 years. Similarly, the numbers for Sweden and Germany are 53% and 42% (Fölster, 2014). The reason for these high numbers is that labour substitution (or crowding out) is not only concentrated to manual and low-skilled labour, but also affects analytical routine and cognitive non-routine tasks in the medium- and high skilled segments.

Although the evidence on socio-economic impact of automation is solid, there are also some that believe that the income channel is the real concern (rather than the employment channel), since work will be transformed by automation, not eliminated. Aggregate positive effects will offset the negative sectorial impact (Lawrence et al, 2017). Yet the critical challenge is likely to be in the distribution of the benefits. If the benefits are managed poorly, automation could lead to a polarisation where the society on aggregate is far richer, but the vast majority of individuals and communities are poorer. Acemogul and Restrepo (2017) find that one new robot for every thousand workers results in a decline in wages of between 1.2-1.6%. On the other hand, if benefits are fairly shared amongst labour and are prevented from being absorbed by capital, automation can help build an economy with a more equitable distribution of wealth, income and working time. The key is in the policies and institutions that are put in place to support this technological transformation and to insure an equitable share, according to Lawrence et al (2017).

5. IMPLICATIONS FOR (MONETARY) POLICY

A number of policies have been proposed to accelerate the economies and prepare the society for the automation age. Most of them are structural, which means that their effects will only be measurable in the medium-to-long run. Those include a flexible and adaptive education system, more emphasis and investment in R&D, policies boosting entrepreneurship, upgrade of internet network infrastructure, new employment regulation, lower taxation of capital-and added value, lower labour-and consumption taxes, universal income, and/or policies aimed at reducing inequality (Dachs, 2017; Witte, 2017). Lawrence et al (2017) propose more fundamental institutional measures in order to manage the automation. First, automation should become a priority of industrial strategy and there should be an increase of investment in automation technologies. Second, an Authority on Ethics in Robotics and Artificial Intelligence should be set up. Third, new models of capital ownership should be implemented including new policies for the diffusion of capital ownership, equitable division of earnings from automation via, for instance, a Citizen's Wealth Fund and Employee Ownership Trust, and a reduction in working hours while improving the quality of life.

Yet, the current literature is silent on how monetary policy should adapt to the new environment. The only input comes from the secular stagnation literature, which argues that real interest rates will need to remain negative for a long period of time in order to correct the aforementioned secular stagnation imbalances, and to equate investment with savings. Although it is highly likely that the negative (or zero) rate will remain in place in the euro area (and some EU economies) under the foreseeable future, I strongly believe that this will not be enough to counteract the imbalances and respond to the structural changes that have emerged over the past 2 decades. First, despite some deleveraging over the past years (more in the US than the euro area), the debt overhang is still a problem. Unconventional quantity-based instruments (such as QE, CE, or balance sheet expansion) will still be required in order to support further corrections in the balance sheet of the private sector while reducing NPLs or other 'bad debt'. This needs to be well tailored in accordance with micro-prudential and macro-prudential policies in order to ensure good and stable transformation of the private sector balances. On the contrary, a reversal in this unconventional policy and a reduction in CB balance sheet may cause financial market disruptions (as there is not enough demand for all the CB liquidity), deflation, loss in firm financing and productivity, and even further depression in aggregate demand, in particular in investment and consumption. The Fed's reluctance to engage in this act despite modest increases in interest rate suggests that they value these risks as material.

More fundamentally, serious considerations should be given to re-formulating monetary policy in terms of objectives, targets, and instruments. The current consensus on monetary policy was built during the Great Stagflation and the reintroduction of volatility resulting from the collapse of Bretton Woods. The (apparent) Great Moderation provided the tailwind that made it possible to implement such a clear and powerful instrument (policy interest rate) that simultaneously anchored the expectations and respected the strict version of the Tinbergen rule. The same instrument provided both economic and financial stability (or at least it was believed so). However, currently there is evidence suggesting that expectations have been de-anchored, and that the tectonic shifts that have occurred in the advanced economies will prevent conventional policy from being effective as other information (or signals) matter in the current state. Moreover, considering that financial policy (both micro-and macroprudential) has gained much significance since the Great Recession, the scope of conventional monetary policy has been significantly reduced. The 'new monetary policy' should take additional care of low growth prospects, interplay between macroeconomic-and financial cycles, private sector balance sheets, and interaction with other policies, in particular financial policy. In this new economic environment, it is important for monetary authorities to have at their disposal a number of instruments, a number of clearly defined and consistent objectives, and most importantly,

to engage more broadly with the financial sector and understand the currents and developments within it in real time.

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Since the start of the global financial crisis, per-capita income growth has stagnated in many advanced economies. Some scholars have interpreted the lack of growth as a temporary phenomenon caused by the legacy of the crisis. Others view the lower long-term growth as a consequence of an unfavourable evolution of the productive inputs (labour and capital) as well as of productivity. Against this background, the current paper examines the long-run evolution of the euro area economy, and suggests some causes for this low-growth phenomenon.

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