The impact on redistribution of the ECB's monetary policy

By Jérôme Creel and Mehdi El Herradi

A few weeks before Christine Lagarde assumes the presidency of the European Central Bank (ECB), it may be useful to examine the balance sheet of her predecessors, not only on macroeconomic and financial matters but also with respect to inequality. In recent years, the problem of the redistributive effects of monetary policy has become an important issue, both academically and at the level of economic policy discussions.

Interest in this subject has grown in a context marked by the conjunction of two factors. First there has been a persistent level of inequality in wealth and income, which has been hard to reduce. Then there are the activities of the central banks in the advanced economies following the 2008 crisis to support growth, particularly through the implementation of so-called "unconventional" measures [1]. These measures, mainly manifested in quantitative easing (QE) programmes, are suspected to have increased the prices of financial assets and, as a result, favoured wealthier households. At the same time, the low interest rate policy could have resulted in a reduction in interest income on assets with fixed yields, most of which are held by low-income households. On

the other hand, the real effects of monetary policy, particularly on changes in the unemployment rate, could help keep low-income households in employment. The ensuing debate, which initially broke out in the United States, also erupted at the level of the euro zone after the ECB launched its QE programme.

In a recent study focusing on 10 euro zone countries between 2000 and 2015, we analysed the impact of the ECB's monetary policy measures – both conventional and unconventional – on income inequality. To do this, we drew on three key indicators: the Gini coefficient, both before and after redistribution, and an interdecile ratio (the ratio between the richest 20% and the poorest 20%).

Three main results emerge from our study. On the one hand, a restrictive monetary policy has a modest impact on income inequality, regardless of the indicator of inequality used. On the other hand, this effect is mainly due to the southern European countries, especially in the period of conventional monetary policy. Finally, we found that the redistributive effects of conventional and unconventional monetary policies do not differ significantly.

These results thus suggest that the monetary policies pursued by the ECB since the crisis have probably had an insignificant

and possibly even favourable impact on income inequality. The forthcoming
normalization of the euro zone's monetary policy could, on the contrary,
increase inequality. Although this increase may be limited, it is important
that decision-makers anticipate it.

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[1] For an analysis of the expected impact of the ECB's unconventional policies, see Blot *et al.* (2015).

The European Central Bank is readying the future

By Christophe Blot and Paul Hubert

At the press conference following the meeting of the ECB's Governing Council on Thursday, 8 June, Mario Draghi announced that the Bank's key interest rates would remain unchanged (0% for the main refinancing operations rate, a negative 0.40% for the deposit facility rate and 0.25% for the lending facility rate). In particular, Draghi gave some valuable insights into the future direction of the euro zone's monetary policy by changing its message. Whereas he had systematically stated that rates could be cut ("at lower levels"), he now stated that they would be maintained at the "present level" for an "extended period of time" and "well past the horizon of our net asset purchases".

By announcing that there would be no further rate cuts, the ECB believes that the current monetary policy stance should

enable it to achieve its objectives, and it is taking the first step towards a further tightening of monetary conditions. However, it should be noted that at the same time the ECB does not expect inflation to return to its 2% target by 2019. The Eurosystem's new macroeconomic projections published during the press conference foresee inflation at 1.5% in 2017, 1.3% in 2018 and 1.6% in 2019[1]. Although the recovery is continuing, inflation will remain below its target level for a period of at least three years, which justifies maintaining an expansionary monetary policy. By clarifying that the rates will not go up upon the termination of the net asset purchases[2], the ECB clearly intends to continue to support economic activity.

Then comes the matter of the date when the asset purchase programme will end. According to the current discourse, the purchases will continue until December 2017, but they could be extended if the ECB deems it necessary. What strategy will the ECB adopt after that? It is possible that the asset purchases will diminish gradually along the lines of what the Federal Reserve did in 2014 [3]. In this case, the end of quantitative easing would take a few more months. This is currently the most likely option, which would push off the interest rate hike until the end of 2018. It is possible, however, that announcements of a reduction in purchases could be made by year end, which could lead to winding up QE by early 2018. Whichever option is chosen, the ECB will undoubtedly take care to communicate its strategy in order to gradually shape expectations about the first rate rise.

However, while this is one important element in the strategy for the normalization of the euro zone's monetary policy, the matter is not limited to the issue of rate rises. The ECB must also provide information about its intentions regarding its negative interest rate policy or about the moment it will decide to no longer satisfy all the requests for fixed-rate refinancing, as it has done since October 2008. Finally, it

also needs to indicate the pace at which it plans to cut down the size of its balance sheet as the Federal Reserve has recently begun to do (see here). The ECB also needs to be transparent on these issues.

[1] These expectations have even been revised downwards since March 2017.

[2] Since April 2017, net asset purchases have come to 60 billion euros per month, compared with 80 billion in the months before that.

[3] The Federal Reserve spread out the reduction of its securities purchases from January to October.

Where are we at in the euro zone credit cycle?

By Christophe Blot and Paul Hubert

In December 2016, the European Central Bank announced the continuation of its Quantitative Easing (QE) policy until December 2017. The continuing economic recovery in the euro zone and the renewal of inflation are now raising questions about the risks associated with this programme. On the one hand, isn't the pursuit of a highly expansionary monetary policy a source of financial instability? Conversely, a premature end to unconventional measures could undermine growth as well as the ECB's capacity to achieve its objectives. Here, we study the dilemma facing the ECB [in French] based on an analysis of credit cycles and banking

activity in the euro zone.

The ECB's announcement gives us two signals about the direction of monetary policy. On the one hand, by delaying the end date of QE, the ECB is implicitly announcing that the normalization of monetary policy, in particular a hike in its key rate, will not take place before early 2018. The ECB will thus continue its expansionary policy of increasing the size of its balance sheet. On the other hand, the reduction in monthly purchases is also a sign that it is toning down its expansionary character. The announcement is similar to the "tapering" that began in January 2014 by the US Federal Reserve. Purchases of securities were cut back gradually, until they actually stopped at the end of October 2016.

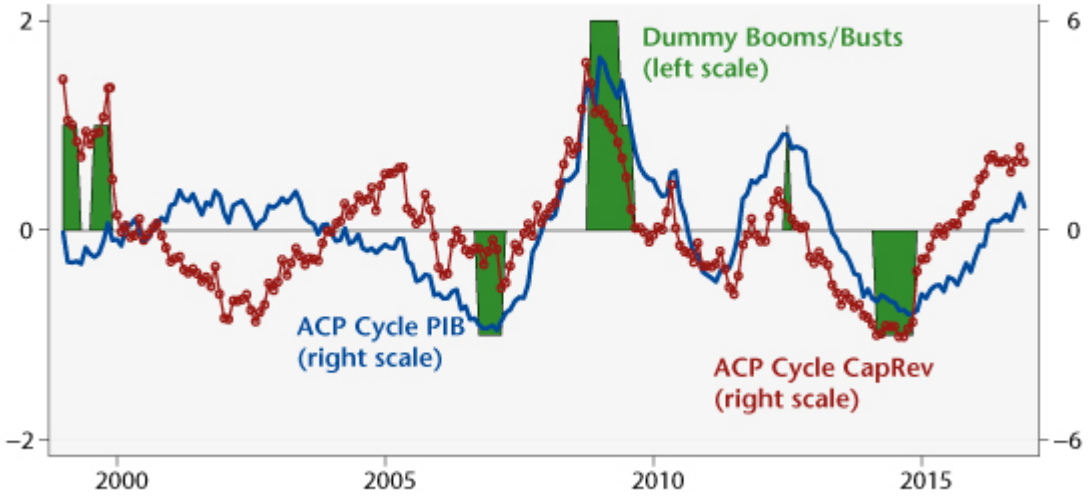
The undeniably expansionary nature of monetary policy in the euro zone suggests that the ECB still considers it necessary to implement a stimulus in order to achieve its ultimate monetary policy objectives. The first of these is price stability, which is defined as inflation that is lower than but close to 2% per year. There are no signs of either runaway inflation or growth [1] [2]. The securities buyback programme should help to consolidate growth and push inflation towards the 2% target. At the same time, the liquidity issued by the central bank in its securities purchase programmes and the low level of interest rates (short and long term) are fuelling fears that monetary stability might have an adverse effect on financial stability[3].

The result leaves the ECB facing a dilemma. Putting a premature end to quantitative easing could keep the euro zone in a state of low inflation and low growth. Unnecessarily prolonging QE, while the US Federal Reserve has begun normalizing its monetary policy, could create a risk of financial instability, resulting in an uncontrolled surge in asset prices, credit, and more broadly the risk taken on by the financial system.

We assess this dual risk using indicators on the activity of the banking system of the euro zone as a whole and of the countries that make it up. Credit, whether granted to households or to non-financial enterprises, is central to bank assets and often at the heart of risks to financial instability[4]. Here we propose extending the analysis to the size of the balance sheet and to total loans granted – including credit to other monetary and financial institutions – which makes it possible to measure the risk associated with the banking system as a whole[5].

These different variables are related either to GDP, which makes it possible to capture the disconnection between banking activity and real activity, or to the capital and reserves of the banking system, which makes it possible to capture the leverage effect, i.e. the capacity of the system to absorb losses. Here we focus on quantities rather than prices, using indicators such as the ratio of credit granted on equity and the ratio of credit received on income. These are central to reflecting the transmission of monetary policy and to assessing the risk of financial instability.

Figure. Credit in the euro zone



Sources : Blot and Herbert (2017) and ECB data.

The graph shows the changes in the credit cycle, relative to GDP (blue line) and relative to the capital and reserves of

the banking system (red line) [6]. The green areas indicate periods when credit deviates significantly above or below its long-term trend. In general, the analysis of credit and of the size of the banking system's balance sheet points to a recovery in activity but it does not suggest either a credit boom or an excessive contraction in the euro zone in the recent period. While credit is evolving in a relatively more favorable direction relative to its trend in France and Germany, the cycle does not indicate an excessive increase. The Netherlands and Spain are distinguished by a low level of credit relative to GDP. For the Netherlands, this trend is confirmed by the indicators relative to the banking system's capital and reserves, while in Spain, outstanding loans relative to capital and reserves are at a historically high level, suggesting an excessive level of risk-taking given the economic situation.

[1] Translation errorDespite the recent rebound in inflation, which is largely linked to the rise in oil prices and inflation expectations, inflationary pressures are still moderate, and getting inflation back to the 2% target is not sufficiently sure to warrant a change in the direction of monetary policy.

[2] Unemployment is still high, fuelling deflation.

[3] A recent analysis by Borio and Zabai (2016) of the effectiveness of unconventional monetary policy suggests that its effectiveness could decrease even as the risks involved increase. The role of asset prices has been studied by Andrade et al. (2016), showing that asset prices had reacted, as expected, following the measures taken by the ECB, and by Blot et al. (2017) on an assessment of the risk of bubbles.

[4] See Jorda *et al.*, 2013 and 2015.

[5] Translation errorThe Basel III legislation is based on risk indicators calculated at the level of banking

establishments, while our approach is based on macroeconomic indicators.

[6] Translation errorThese cycles are obtained using a principal component analysis (PCA) of several types of trend / cycle breakdowns: the Hodrick-Prescott filter, the Christiano-Fitzgerald filter, and the moving average.

Leave the euro?

By Christophe Blot, Jérôme Creel, Bruno Ducoudré, Paul Hubert, Xavier Ragot, Raul Sampognaro, Francesco Saraceno, and Xavier Timbeau

Evaluating the impact of France leaving the euro zone ("Frexit") is tricky, as many channels for doing this exist and the effects are uncertain. However, given that this proposal is being advanced in the more general debate over the costs and benefits of membership in the European Union and the euro, it is useful to discuss and estimate what is involved.

There is little consensus about the many points involved in an analysis of the issue of membership in the euro. On the one hand, the benefits linked to the single currency 18 years after its creation are not viewed as completely obvious; on the other, it is not evident that the monetary zone has become less heterogeneous, and, possibly linked to that, the current account imbalances built up in the first decade of the euro zone's existence, which have grown since then due to the consequences of the 2008 global financial crisis, are putting constraints on economic policy.

The dissolution of Europe's monetary union would be an unprecedented event, not only for the member states but also from the point of view of the history of monetary unions. Not that there have been no experiences of dissolution – Rose (2007) counted 69 cases of withdrawal from a monetary union since the end of the Second World War – but in many respects these experiences offer little if any basis for comparison (Blot & Saraceno, 2014). Nor do they reveal any empirical patterns that could inform us about the possible misfortunes or chances of success that a break-up of the euro zone might have.

However, the reference to past episodes is not the only tool with which the economist can carry out an analysis of a break-up of the euro zone. It is indeed possible to highlight the mechanisms that would be at work if the monetary union project in Europe were to be wound up. There are numerous possible pathways to a break-up of the euro zone, and any analysis of the costs and benefits must be interpreted with the utmost caution, since in addition to uncertainty about any quantitative assessment of what is involved, there is also the issue of what scenario an exit would create. In these circumstances, a departure from the euro zone cannot necessarily be understood solely from the point of view of its impact on exchange rates or its financial effects. It is very likely that an exit would be accompanied by the implementation of alternative economic policies. The analysis carried out here does not enter this territory, but merely explains the macroeconomic mechanisms at work in the event of a break-up of the euro zone, without detailing the reaction of economic policy or second-round effects.

The central hypothesis adopted here is that involving a complete break-up of the monetary union, and not the simple departure of France alone. Indeed, if France, the second-largest euro zone economy, were to exit, the very existence of the monetary zone would be called into question. The

devaluation of the French franc against the southern Europe countries remaining in the euro zone would destabilize their economies and push them out of the scaled-down euro zone. We do not deal here with all the technical elements related to how a break-up would be organized [1] – launching the circulation of new currencies, liquidation of the ECB and termination of the TARGET system, etc. – but rather on an analysis of the macroeconomic effects [2]. Two types of effects would then be at work. First, the dissolution of the European monetary union would de facto lead to a return to national currencies, and therefore to a devaluation or revaluation of the currencies of the euro zone countries vis-à-vis not only their euro zone partners but also non-euro zone countries. Second, the redenomination of assets and liabilities now denominated in euros and the prospect of exchange movements would have financial effects that we analyze in the light of past financial crises. Our scenario is therefore for a contained crisis.

A unilateral exit from the euro zone by France and the ensuing break-up of the euro zone exclude a scenario for a common currency where strong cooperation between the old member states would help to maintain a high level of exchange stability and effectively continue the economic status quo. There is little likelihood of a scenario like this, since it would lead to not using the margins of maneuver opened up by the exit and to maintaining the much-denounced and presumed straitjacket. The crisis would be contained in that the most violent effects would be reduced by coordinated policies. This would mean exchange movements that are rapid and substantial, but which stabilize over a time horizon of a few quarters [3]. We assume, furthermore, that each country pursues its own interest without special co-operation.

I – A summary of the economic mechanisms at work

The gains expected from leaving the euro zone

In the first place, leaving the euro zone would mean that the exchange rates between the currencies of the countries that compose it could once again vary against each other. Given this, the question arises of the value at which the exchange rates of these currencies will tend to converge. The expected gains would be, on the one hand, an improvement in competitiveness due to the devaluation of the franc. A devaluation would lead to imported inflation in the short term, before increasing purchasing power and spurring growth. The second gain involves the possibility of defining a monetary and fiscal policy that is differentiated by country, and therefore more appropriate to France's situation.

An exit from the euro zone would also make it possible to set tariffs less favorable to imports from other countries, and thus more favorable to producers on the national territory, but which would also affect consumer prices and thus consumer purchasing power[4].

The costs of leaving the euro zone

France's exit from the euro zone would lead to the departure of other countries, which would see their currencies depreciate against the franc, especially the southern European countries. The net effect on competitiveness may prove ambiguous.

A Frexit would lead to currency movements, which would translate into a return of transaction costs on currency exchanges between euro zone countries. Moreover, the break-up of the euro zone would also lead to a redenomination of assets and debts in the national currency. Beyond the legal aspects, these balance sheet effects would impoverish agents who hold assets denominated in a depreciating currency or debts re-denominated in an appreciating currency (and enrich those in the reverse situation). Uncertainties about balance sheet effects, particularly for financial intermediaries and banks, could be expected to lead to a period experiencing a sharp

downturn in lending.

How much additional autonomy would be acquired for monetary policy is uncertain at present. Indeed, it is difficult to conceive of a monetary policy that is much more expansionary than the ECB's policy of negative rates and security redemptions [5]. The Banque de France could, of course, buy back the national public debt by creating money, but, in light of the low current interest rates on French sovereign debt, it is not clear that this would lead to significant gains [6]. It should be noted that a persistent current account deficit would need to be financed by external savings and that this external constraint could affect monetary policy, for example by requiring an increase in short-term and long-term interest rates that could impose capital controls by the government.

Finally, the introduction of trade protectionism would obviously lead to retaliation by the aggrieved partners, which would hurt French exports. The overall net effect on world trade would be negative, with no gain at the national level.

II – The impact on exchange rates and competitiveness

A Frexit would not lead to strong gains in competitiveness. We simulated the effect of a Frexit in the following way:

1. We assume that a Frexit would lead to a rapid disintegration of the euro zone;

1. We then use our estimates of long-run equilibrium exchange rates presented in Chapter 4 of the *2017 iAGS Report*. It appears that the equilibrium parity for the new franc would correspond to an actual effective devaluation of 3.6% compared to the current level of the euro. This is a real change, once it has been corrected for the effects of inflation and is effective, that is, taking into account exchange rate fluctuations in relation to different trading partners, possibly in the opposite direction. The new franc would be devalued

relative to the German currency, but would appreciate relative to the Spanish currency;

2. Using the empirical estimates of exchange rate adjustments (Cavallo et al., 2005), we determine a short-term exchange rate trajectory. Our estimate is for a 13.7% depreciation of France's effective exchange rate with respect to the other euro zone countries, and an appreciation of 8.6% with respect to the countries that do not belong to the euro zone.

Using simulations with the emod.fr model, we estimate a modest increase in competitiveness. The effect on GDP would be close to 0 in the first year and 0.4% after three years. These figures are low and refer to a scenario without any readjustment within the euro zone. If we consider the possibility of a gradual adjustment within the euro zone (based on the mechanisms, for example, referred to in *iAGS 2016*), the potential gain would be even lower. Once again it is possible to envisage that the monetary policy conducted by the Banque de France would seek to devalue the French currency more strongly than that of its competitors. But in such a scheme, it is very likely that the latter will in turn wish to preserve their competitiveness and engage in a policy of competitive devaluations.

III – The financial impact: The effects of the banking crises

The dissolution of the euro zone and the return to national currencies would have significant repercussions for the national banking and financial systems through their international business, and it would bring about a return of exchange rate risk within the euro zone. We first assess the risks that the collapse of the euro zone would have for the banking system. The mechanisms at work are likely to provoke a banking crisis, which could have a high cost for economic activity.

The return to national currencies in a financially integrated

space would necessarily entail a major upheaval for the financial system. These effects would not be comparable to those observed at the time the euro was adopted. Indeed, as Villemot et Durand (2017) have shown, potentially the balance sheet effects would be significant for a low coordination scenario.

The balance sheet effects could be reduced if there were international coordination when leaving the euro. Such co-ordination would make it possible to distribute the ECB's assets and liabilities in a coherent way, notably within the framework of TARGET 2. However, it's difficult to assume a significant level of coordination when leaving the eurozone, and it is illusory to believe that the difficulties in achieving coordination will lessen. On the contrary, they are likely to increase in a climate of instability instead of one with a shared destiny. As a result, the scenario we use for leaving the euro zone excludes the establishment of a new financial or monetary architecture.

The risk of a banking or financial crisis is central to understanding the impact of the break-up of the euro zone. The impacts would pass through three main channels. The first involves a flight of deposits and savings and the distress liquidation of financial assets. The second is related to the effects of currency misalignments on banks' balance sheets and insurers. The third concerns the sovereign risk that would affect either the public debt and its financing, or if this debt were subject to uncontrolled monetization, the return of intense external pressure. The economic literature includes recent efforts (notably Rogoff and Reinhart, Borio, Schularik, the IMF) to try to evaluate banking or financial crises. It should be clarified at the outset that this literature does not deal with the dissolutions of monetary unions. In the various banking crises recorded since the 1970s by Laeven and Valencia (2010 and 2012), there is no mention of a crisis linked to the dissolution of a monetary union. Nevertheless,

the financial dynamics in play in the event of the break-up of the euro zone would be, as mentioned above, risk factors for a banking or financial crisis.

Moreover, the economic literature on currency crises has pointed to the link with banking crises (Kaminsky and Reinhart, 1999). The collapse of a monetary union in reality reflects a crisis situation for the exchange rate system, which leads to revaluations and devaluations with the over-adjustment of exchange rates, as highlighted in the previous section. The reference to the cost of banking crises thus illustrates the potentially negative effects of exiting the euro zone. However, it should be remembered that these costs correspond to an overall assessment of banking crises that does not make it possible to identify precisely the mechanisms through which the financial shock is propagated into the real economy – an assessment that would involve identifying the impact of rising risk premiums and the effect of credit rationing, where it is much more difficult to determine the uncertainty. An analysis by Bricongne et al. (2010) of the various channels through which the 2007-2008 financial crisis was transmitted suggests that a significant amount remains unexplained. Also, in the absence of a more detailed analysis, we make the assumption that the historical experiences of banking crisis are the main quantitative element that can be used to get close to the eventual negative impact – via the financial effects – of a break-up of the euro zone.

Laeven and Valencia (2012) analysed 147 banking crises in developed and emerging countries over the last few decades (1970-2011). They calculated the losses in production as the three-year cumulative loss of actual GDP relative to trend GDP [7]. For the developed countries, the cumulative loss of growth was on average 33 GDP points. During these three crisis years, the public debt increased on average by 21 GDP points (partly due to bank recapitalizations), the central bank's balance sheet increased by 8 GDP points, and the level of non-

performing loans increased by 4 percentage points. It should be noted that there was a high degree of heterogeneity in the cost of the crises, depending on the crisis and country in question. For example, the authors' assessment of the cost of the 2008 banking crisis in terms of growth following the bankruptcy of Lehman Brothers was 31 GDP points for the United States and 23 GDP points for the euro zone as a whole. Hoggarth, Reis and Saporta (2002) conducted a similar study and sought to provide robust assessments of trend GDP. They noted cumulative production losses during crisis periods ranging from 13 to 20 GDP points, depending on the indicator chosen. However, these estimates of the cost of banking crises are to be taken with caution, since they are based on numerous assumptions, in particular on the trajectories that countries would have followed in the absence of a crisis.

IV – The gains from monetary autonomy

The gains from an alternative monetary policy would depend on the new direction taken by a monetary policy that remains to be defined and that will determine the conditions for financing the economy. Such a policy would probably be ultra-accommodative due to the financial and banking instability generated by the balance sheet effects.

Evaluations of the contribution of financial conditions in France from 2014 to 2018, however, suggest that these are not the most important factor explaining the sluggishness of economic activity. Over this period, the contribution of financial and monetary conditions to GDP growth is between -0.1 and 0.2 points [8]. There is thus little gain to be expected from a new ultra-accommodative monetary policy (independently of the effects on exchange rates discussed in the first section or the impact of external pressure).

Conclusion

This text has attempted to outline the possible consequences

of a Frexit, without going into too detailed and therefore perilous quantification.

1. Contrary to what is sometimes advanced, there is little to be expected in terms of competitiveness or manoeuvring room for short-term monetary policy;
2. The main cost would come from the banking or financial crisis arising from balance sheet effects, particularly given the context of a disorderly exit.

At this stage of the analysis, it is difficult to identify the potential positive economic effects of a Frexit, while the risks of a negative impact due to financial effects seem to be very significant.

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[1] These points are to a large extent discussed in *Capital Economics* (2012).

[2] It is difficult to develop a long-term counterfactual scenario in the case of exiting the euro. We therefore focus on the short- and medium-term effects of possible transitions.

[3] We implicitly eliminate the scenario of a currency war where each country would try to gain competitiveness by devaluations that would permanently lead us away from convergence towards a real equilibrium exchange rate.

[4] The introduction of tariffs like this calls for leaving the European Union. Without developing this analysis here, it is very likely that leaving the euro zone would lead to leaving the European Union. There have been assessments of the EU's contribution to intra-European trade and growth that we are not using here in our short-term approach.

[5] Through its quantitative easing program, the ECB essentially purchases sovereign debt bonds, including French debt securities. In February 2017, the outstanding securities held by the ECB under this programme (PSPP) amounted to € 1,457.6 billion. Breaking down the purchases based on the share of the ECB's capital subscribed by the central banks of the member states, the fraction of French debt securities exceeds 200 billion euros.

[6] Getting free from the constraints of the Stability and Growth Pact could be a gain in itself. This assumes that the

constraints of the SGP go beyond simply the sustainability of the public debt demand.

[7] These evaluations show, however, that there is a high degree of heterogeneity in the assessed costs depending on the country in question.

[8] https://www.ofce.sciences-po.fr/pdf/documents/prev/prev1016/france.pdf

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How negative can interest rates get?

By Christophe Blot and Paul Hubert

On 11 June 2014, the European Central Bank decided to set a negative rate on deposit facilities and on the excess reserves held by credit institutions in the euro zone. This rate was then lowered several times, and has been -0.40% as of March 2016. This raises questions about the reasons why agents, in this case the commercial banks, agree to pay interest on deposits left with the ECB. In an article on the causes and consequences of negative rates, we explain how the central bank has come to impose negative rates and how far they can go, and then we discuss the costs of this policy for the banks.

To conduct its monetary policy, the ECB requires commercial banks in the euro zone to have an account with the Bank, which is used to meet the minimum reserve requirements[1] and to participate in operations to provide liquidity. This account can also be used to perform clearing transactions between commercial banks. The required reserves are remunerated at a

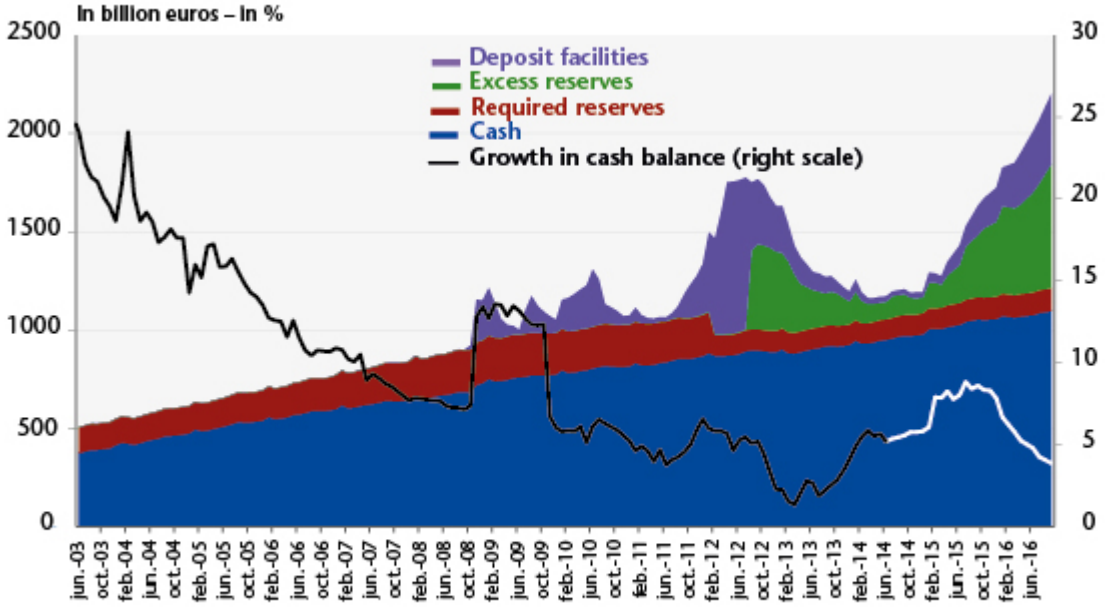
rate set by the ECB. Beyond this amount, in normal circumstances the banks do not receive any other compensation. Moreover, the ECB also provides a deposit facility allowing the banks to deposit cash with the ECB for a period of 24 hours, with remuneration paid at a deposit facility rate.

Prior to 2008, the commercial banks held only the reserves that they needed to meet the minimum reserve requirements (see the graph). Any stock of excess reserves[2] was very small: less than 1 billion euros on average until 2008. The same was true for the balance of deposit facilities, which was 321 million euros on average. Since the crisis, the ECB has replaced the interbank market and has intervened to provide a large amount of liquidity. Through the banks' participation in various ECB programmes to purchase securities (quantitative easing, QE), they also receive liquidities that are placed in their reserve account, to such an extent that by September 2016 the accumulated stock of excess reserves and deposit facilities reached 987 billion euros. The negative rates do not apply to all monetary policy operations but only to the portion of the cash left on deposit by the banks (total assets of the euro zone banks are 31 trillion euros). At the current rate, the direct annual cost to the banks is thus 3.9 billion euros.

Given that the banks are not required to hold these excess reserves, it is reasonable to ask why they accept to bear this cost. To answer this question, it is necessary to examine the possibilities for trade-offs with other assets that could be used as a substitute for the excess reserves. The reserves are in fact money[3] issued by the central banks solely for the commercial banks and are therefore a very liquid asset. But the rates on the money market are also negative, to such an extent that it is a matter of indifference to the banks whether they have excess reserves and place their liquidities on the interbank market for a week or buy Treasury securities issued by the French or German government, for example, with

yields that are also negative.

Graphique. Reserves and cash



Note: The rate of growth of the cash balance (year on year) is shown by a white line during the period of negative rates.

Source : ECB.

Actually, the best substitute for the reserves would be to hold the cash directly. The substitution could therefore take place within the monetary base if the banks called for the conversion of their excess reserves and deposit facilities into cash, which has the same properties in terms of liquidity and zero nominal interest. Currently this would mean converting 987 billion euros of reserves into banknotes, nearly doubling the amount outstanding, as the volume of notes in circulation in September 2016 was 1,096 billion euros.

The fact that these agents can have an asset that is not interest-bearing is the argument for why nominal rates cannot be negative. In practice, because there are costs to holding currency in the form of notes, this trade-off does not take place when the threshold for negative rates is exceeded. The nominal rate can therefore be negative. It is clear however that there is a threshold at which holding cash would be preferable. The cost of holding large amounts of cash is not

known precisely, but it seems that it is not insignificant, and in any case is higher than the 0.4% currently charged by the ECB.

It seems that in practice there has not yet been any such substitution, since the volume of outstanding notes in circulation has not risen particularly since negative rates were first set (graph). Jackson (2015) has made an assessment indicating that the various costs of holding money in the form of notes and coins could be up to 2%, which would act as an effective lower bound (ELB) for a reduction in rates.

Beyond the costs that negative rates represent for banks, the expected benefits of such a policy need to be considered, as well as the overall context in which they have been set. Together with negative rates, the ECB is using its targeted long-term refinancing operations (TLTRO II) to enable the banks to finance themselves at negative rates, and is thus urging them doubly (via the cost of their excess reserves and via the rate at which they are financed) to grant credit to the real economy.

[1] Credit institutions are in practice required to leave reserves in this account in the amount of a certain fraction of deposits collected from the non-financial sector. See here for more details.

[2] Amount of reserves beyond the required reserves.

[3] Together with the banknotes issued, these form what is called the monetary or money base, M_0.

What would be the risks of extending QE?

By Christophe Blot, Paul Hubert and Fabien Labondance

Following the last meeting of the ECB Governing Council on 22 October, Mario Draghi said that on Thursday, December 3rd, the Bank would review the orientation of its monetary policy in the light of economic and financial developments and the new Eurosystem staff forecasts, which will be disclosed at that time. The main issue facing the meeting is whether the ECB will take new steps to support activity. It could for instance announce further cuts in the deposit facility rate or an extension of quantitative easing (QE). Up to now the ECB has been careful to show its determination to meet its primary objective of price stability, even though in return it is encountering criticism that these waves of monetary expansion have had little effect on inflation but are fuelling asset price bubbles.

With inflation at 0.1% in October, the ECB is far from meeting its goal of achieving inflation rates below but close to 2% over the medium term. While the low level of euro zone inflation is due in part to lower oil prices, the fact remains that, even when adjusted for energy and food components, so-called “headline inflation” has not exceeded 1% since September 2013, reflecting a persistent state of low inflation. Note that the figure for October is the last observed value of inflation and provides only imperfect information about how it is changing in the medium term. The central banks are thus particularly sensitive to changes in inflation expectations. Market indicators however point to a further decline in long-term inflation expectations, whereas these rose in January after the announcement of QE (see graphic). So while there has been only very gradual confirmation of a recovery in the euro zone, the fear of

deflation has not abated, which should push the ECB to strengthen its support. In a previous analysis, which was based on quantitative easing programmes undertaken by the US Federal Reserve and the Bank of England, we emphasized the positive effects that QE was expected to have in the euro zone. The trends in euro exchange rates seen after the ECB's announcements in January 2015 and at the October meeting suggest that there is an impact via exchange rate channels.

Beyond these channels is the question of how QE affects asset prices. Several studies show that an expansionary monetary policy based on asset purchases supports financing and results in higher asset prices. However, some observers are also concerned about the risks associated with these operations, arguing that they feed asset price bubbles, that is to say, increases in prices that are not justified by economic fundamentals. Nevertheless, this kind of analysis relies solely on the rise in share prices to support these arguments. In a **recently published study (*Revue de l'OFCE*, issue 144, November 2015,** in French), we focus on the effects of monetary policy on three asset prices in the euro zone: the markets for equities, bonds and property. Our analysis suggests that monetary policy decisions would have no impact on asset prices that is not due to fundamentals. Thus, an interest rate cut does not seem to fuel bubbles, just as a tightening of monetary policy does not lead to a decline beyond what is indicated by the usual determinants of asset prices. While the channel of asset prices [1] does seem to be at work, monetary policy has no additional effects on the component of asset prices beyond what is due to economic fundamentals.

Figure. Long-term inflation expectations

Note: Expectations are measured here by the difference between the yields of 10 year indexed and non-indexed bonds. The measure obtained thus reflects inflation expectations over this 10 year horizon.
Source: ECB, Federal Reserve.

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[1] This channel may be divided in two: Tobin's Q channel and the channel of wealth effects. The first suggests that a reduction in interest rates is likely to have a favourable impact on share prices, since share prices correspond to the present value of future dividends. An increase like this in share prices lowers the cost of capital for businesses, and supports their investments (like traditional capital, but via a different mechanism, as higher share prices make share issues more attractive). The second suggests that household consumption may also benefit from lower interest rates: the increase in the prices of financial or property assets resulting from lower interest rates increases their total value and promotes consumption. In a model where households seek to smooth consumption over the life cycle, they spend more when their wealth rises.

Is Greece in the process of divorce?

By Jérôme Creel

The ongoing Greek saga is looking more and more like an old American TV series. JR Ewing returns to the family table feeling upset with Sue Ellen for her failure to keep her promise to stop drinking. Given the way things are going, a divorce seems inevitable, especially if Bobby sides with his brother and refuses to help his sister-in-law any longer.

Just like in Dallas, addiction to a potentially toxic substance, public debt, is plaguing Europe's states and institutions. Analyses on Greece focus mainly on debt-to-GDP ratios. On these terms, Greece's public debt-to-GDP ratio rose from 2011 to 2014: European public opinion can therefore legitimately question the ability of the Greek people (really the Greek state) to curb spending and raise taxes. A divorce is inevitable. But if we look at the amounts involved, the situation seems somewhat different.

Between 2011 and 2014, Greece's public debt decreased by 39 billion euros according to Eurostat. Seen in this light, the Greek state is making a real effort. But this obscures the aid of the creditors. The Greek state has in fact benefited from the restructuring of its debt, including a partial but important default on its public debt to its private creditors. According to Jeromin Zettelmeyer, Christoph Trebesch and Mitu Gulati, the amount of debt for which the Greek state was forgiven was on the order of 100 billion euros. Without this aid, the amount of Greece's debt would have increased between 2011 and 2014 by 61 billion euros (100 billion minus the

aforementioned 39 billion). This is not nothing for a country like Greece. However, note that Greek debt accounts for only 3.5% of the euro zone's total public debt.

Furthermore, how were the other EU countries faring at the same time? No better! The addiction to public debt, if we can indeed speak of addiction, is general. The public debt of the EU and the euro zone rose by 6 GDP points, or by 1400 billion and 800 billion respectively. By comparison, the increase in the Greek debt is a drop in the ocean. Germany's public debt rose by 68 billion euros, Italy's by 227 billion, Spain's and France's by 285 billion respectively, and the United Kingdom's by 277 billion pounds, or 470 billion euros, again according to Eurostat. Relative to their respective GDPs, Spain's debt increased by almost 30 points, Italy's by more than 15 points, France's by 10 points, and the UK's by nearly 8 points. Only Germany has seen its debt ratio go down, thanks to stronger economic growth.

Paul de Grauwe recently insisted on the fact that Greece's debt is sustainable: given the various debt restructurings already undertaken, the public debt-to-GDP ratio of 180% would be roughly 90% in present value, i.e. after having accounted for future interest payments and scheduled repayments, some of which are in a very distant future[1].

Economists, including in this case Paul de Grauwe, use the state's intertemporal budget constraint to understand the sustainability of public debt. Rather than using a retrospective approach, the public debt can be analysed from a prospective approach. If the following year's debt depends on the present debt, then by symmetry, the present debt depends on the following year's debt. But next year's debt will depend on the following year's debt, by iteration. Ultimately, the present debt depends on the debt of the following year and on and on until the end of time: it depends on future debts. But these future debts also depend on future public deficits. The intertemporal budget constraint thus expresses the fact that

today's public debt is equal to the sequence of future public deficits and to the final debt (that at the end of time), all expressed in present values.

In contrast to businesses and households, the state is supposed to have an infinite time horizon, which makes it possible to reset the present value of the debt at the "end of time" to zero. We can then say that the public debt is sustainable if future governments provide adequate public surpluses to pay off that debt. This is possible after periods of high public deficits, provided that these periods are followed by others during which governments accumulate budget surpluses. Given the extension of the maturity of Greek debt and the low level of future interest payments, the budget surplus required to repay the current debt is low. Paul de Grauwe concludes that Greece is subject to a liquidity crisis rather than a sovereign default crisis. So, again according to Paul de Grauwe, what is needed is to adjust the fiscal austerity plans and forthcoming reforms to the actual level of the public debt, which is substantially lower than the level being used as the basis for negotiations between the Greek state and the "institutions" (ECB, Commission, IMF). In other words, the "institutions" can loosen their grip.

The "Greek case" can thus be relativized and the divorce put off. Sue Ellen's addiction is less exceptional than it seems at first glance.

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[1] After 2015 and 2019, which will involve substantial repayments from the Greek state, the "difficult" years will then be situated beyond 2035 (see the amortization profile of Greece's debt in Antonin *et al.*, 2015).

The spirit of the letter of the law … to avoid a "Graccident"

Raul Sampognaro and Xavier Timbeau

The noose, in the words of Alexis Tsipras, is getting tighter and tighter around the Greek government. The last tranche of the aid program (7.2 billion euros) has still not been released as the Brussels Group (the ex-Troika) has not accepted the conditions on the aid plan. The Greek state is therefore on the brink of default. It might be thought that this is simply one more episode in the drama that Greece has been acting out with its creditors and that, once again, at the last moment the money needed will be found. But if Greece has managed to meet its deadlines up to now, it has been at the price of expedients that it is not at all certain can be used again.

While tax revenues since the start of the year have been almost one billion euros behind the anticipated targets, the expenses for wages and pensions still have to be paid each month. This time the wall is getting closer, and an agreement is needed if the game is to continue. In June, Greece must pay 1.6 billion euros to the IMF in four tranches (5, 12, 16 and 19 June). On 28 May an IMF spokesperson confirmed the existence of a rule that would make it possible to group these payments on the last day of the month (a rule last used by Zambia in the 1980s). Since it would then take six weeks for the IMF to consider Greece in default, the country could still gain a few days after 30 June before the deadline with the ECB (with 2 tranches for a total 3.5 billion euros by 20 July

2015).

Historically very few countries have failed to honour their payments to the IMF (currently only Somalia, Sudan and Zimbabwe are in arrears to the IMF, for a few hundred million dollars). As the IMF is the last resort in case of a crisis in liquidity or the balance of payments, it has, as such, the status of preferred creditor, so defaulting on its debt may trigger cross defaults on other securities, in particular, in the Greek case, those held by the European Financial Stability Facility (EFSF). This could make them due immediately. A Greek default with the IMF could well jeopardize Greece's entire public debt and force the ECB to reject Greek bonds as collateral in the Emergency Liquidity Assistance (ELA) operations, the only firewall remaining against the collapse of the Greek banking system.

The legal consequences of such a default are difficult to grasp (which says a lot about the modern financial system). An article published by the Bank for International Settlements, dated July 2013, whose author, Antonio Sainz de Vicuña, was then Director General of ECB Legal Services, is very informative about this issue in the context of the Monetary Union.

In presenting the legal framework, Sainz de Vicuña focuses on Article 123 of the Treaty on the Functioning of the European Union (TFEU), a pillar of the Monetary Union, which prohibits the ECB or the national central banks from financing government[1]. In a footnote, the author concedes that there are two exceptions to this rule:

– "Credit institutions controlled by the public sector, which may obtain central bank liquidity on terms identical to private credit institutions." This exception appears explicitly in paragraph 2 of Article 123 of the TFEU[2].

– “The financing of state obligations vis-à-vis the IMF.”

This second aspect has attracted our attention because it is little known to the general public, it does not appear explicitly in the Treaty and it could be a solution, at least in the short term, to avoid Greece being put in default by the IMF .

In searching the corpus of European law, this exception is defined more precisely in Council Regulation no. 3603/93, which clarifies the terms of Article 123 of the TFEU, which it is authorized to do under paragraph 2 of Article 125 of the TFEU[3]. More specifically, in Article 7:

The financing by the European Central Bank or the national central banks of obligations falling upon the public sector vis-à-vis the International Monetary Fund or resulting from the implementation of the medium-term financial assistance facility set up by Regulation (EEC) No 1969/88 (4) shall not be regarded as a credit facility within the meaning of Article 104 of the Treaty[4].

The justification for this article is that: during quota increases in the IMF, the financing by the central bank was accepted because It had as a counterpart an asset comparable to international reserves. In the spirit of the law, financing Greek borrowing from the IMF by a credit from the central bank (the ECB or the Bank of Greece) should not be permitted. The obligations falling upon the Greek state probably only concern, according to the spirit of the text, the contribution to the IMF quotas. Nevertheless, the spirit of the law is not the law, and the proper interpretation of the phrase “obligations falling upon the public sector *vis-à-vis* the International Monetary Fund” could open another door for Greece. Given the consequences of a default with the IMF – in particular the continuity of the ELA – invoking this could be justified as preserving the functioning of the Greek payment

system, a role falling within the mission of the ECB.

Beyond the legal possibility of a central bank financing Greece's debt to the IMF, which would certainly be challenged by some governments, this action would open up a political conflict. A MemberState could be accused of violating (the spirit of) the Treaties, even though that is not a reason to exclude it (according to the ECB's Legal Services). But is this really an obstacle in view of the importance a default on Greece's debt would have for the sustainability of the single currency?

Greece's cash flow problems are not new. Since January, the government has been financing its expenditure through accounting transactions that allowed it to offset tax losses. In particular, on 12 May, the Greek government was able to repay an IMF loan tranche by drawing on an emergency fund that was essentially international reserves. The Eurosystem was able to use this exception to give Greece extra time in order to continue the negotiations and avoid the accident.

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[1] Paragraph 1 of the article stipulates that, "Overdraft facilities or any other type of credit facility with the European Central Bank or with the central banks of the Member States (hereinafter referred to as "national central banks") in favour of Union institutions, bodies, offices or agencies, central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of Member States shall be prohibited, as shall the purchase directly from them by the European Central Bank or national central banks of debt instruments."

[2] Which stipulates that, "Paragraph 1 shall not apply to publicly owned credit institutions which, in the context of the supply of reserves by central banks, shall be given the same treatment by national central banks and the European

Central Bank as private credit institutions."

[3] Which stipulates that, "The Council, on a proposal from the Commission and after consulting the European Parliament, may, as required, specify definitions for the application of the prohibitions referred to in Articles 123 and 124 and in this Article."

[4] Article 104 became Article 123 in the TFEU.

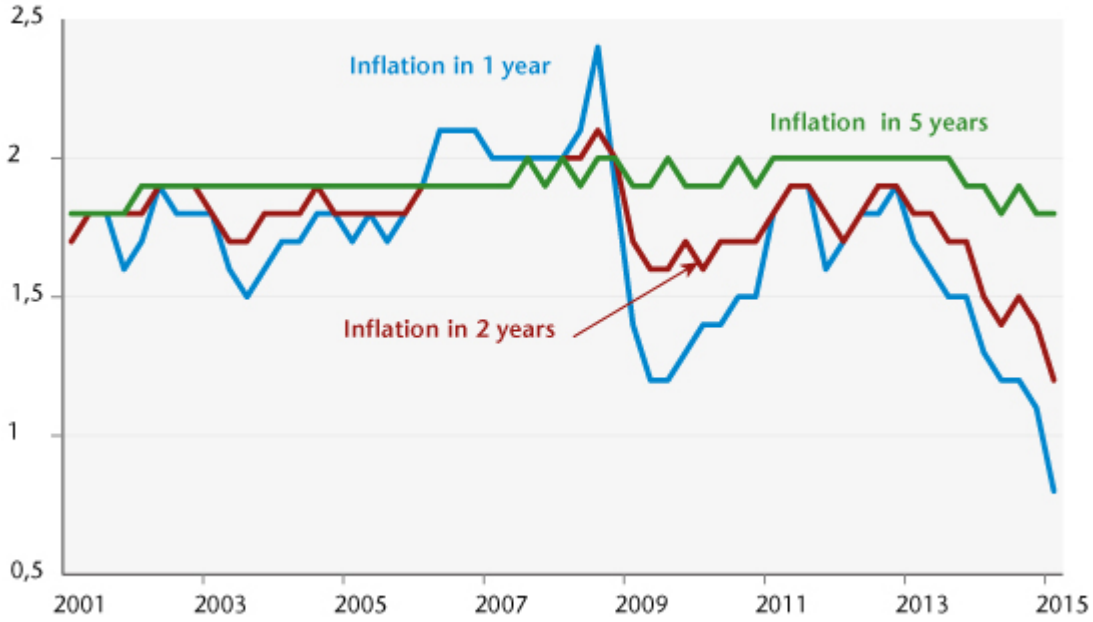
The ECB's quantitative easing exercise: you're never too young to start

By Christophe Blot, Jérôme Creel, Paul Hubert and Fabien Labondance

The ECB decision to launch a quantitative easing (QE) programme was widely anticipated. Indeed, on several occasions in the second half of 2014 Mario Draghi had reiterated that the Governing Council was unanimous in its commitment to take the steps needed, in accordance with its mandate, to fight against the risk of a prolonged slowdown in inflation. Both the scale and the characteristics of the ECB plan announced on 22 January 2014 sent a strong, though perhaps belated signal of the Bank's commitment to fight the risk of deflation, which has been spreading in the euro zone, as can be seen in particular in inflation expectations over a two-year horizon (Figure 1). In a special study entitled, "Que peut-on attendre du l'assouplissement quantitatif de la BCE?" ["What can we

expect from the ECB's quantitative easing?"], we clarify the implications of this new strategy by explaining the mechanisms for the transmission of quantitative easing, drawing on the numerous empirical studies on previous such programmes in the US, the UK and Japan.

Figure. Inflation expectations in the euro



Source : ECB (Survey of Professional Forecasters).

The terms of the quantitative easing decided by the ECB are indeed similar to those adopted by other central banks, especially by the US Federal Reserve and the Bank of England, which make comparisons legitimate. It appears from the American, British and Japanese experience that the measures implemented have led to a decline in sovereign interest rates and more generally to an improvement in the financial conditions of the overall economy[1]. This has been the result of sending a signal about the present and future stance of monetary policy and a reallocation of investors' portfolios. Some studies [2] also show that the US QE caused a depreciation of the dollar. The transmission of QE from the ECB to this variable could be critical in the case of the euro zone. An analysis using VAR models shows that the monetary policy measures taken by the ECB will have a significant

impact on the euro but also on inflation and inflationary expectations. It is likely that the effects of the depreciation of the euro on European economic activity will be positive (cf. Bruno Ducoudré and Eric Heyer), which would make it easier for Mario Draghi to bring inflation back on target. The measure would therefore have the positive effects expected; however, it might be regrettable that it was not implemented earlier, when the euro zone was mired in recession. Inflation in the euro zone has fallen constantly since late 2011, reflecting a gathering deflationary risk month after month. In fact, the implementation of QE from March 2015 will consolidate and strengthen a recovery that would undoubtedly have occurred anyway. Better late than never!

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[1] The final impact on the real economy is, however, less certain, in particular because the demand for credit has remained stagnant.

[2] Gagnon, J., Raskin, M., Remache, J. and Sack, B. (2011). "The financial market effects of the Federal Reserve's large-scale asset purchases," *International Journal of Central Banking*, vol. 7(10), pp. 3-43.

The Greek Sisyphus and its public debt: towards an end to the ordeal?

By Céline Antonin

After its failure to elect a new President by a qualified majority vote, the Greek Parliament was dissolved, with early elections to be held on 25 January 2015. The radical left party Syriza is leading the opinion polls on the election, ahead of the "New Democracy" party of the outgoing Prime Minister, Anthony Samaras. While Syriza's economic programme has met with enthusiasm from the population, it has aroused concern from the Troika of creditors (IMF, ECB and EU), particularly on three issues: the country's potential withdrawal from the euro zone, the implementation of a fiscal stimulus, and a partial sovereign default. This last topic will be the main issue after the elections.

The election's real stakes: restructuring Greece's public debt

Fears about Greece's potential exit from the euro zone (the infamous "Grexit") need to be nuanced. The situation is different from what it was at the time of the sovereign debt crisis, when bond rate differentials were fuelling worry about contagion and the breakup of the euro zone. Furthermore, Syriza is not in favour of leaving the euro, and no-one can force the country's hand, given that there is no provision for this in any text. Finally, the consequences of such a decision on the other members could be severe, so that a Greek withdrawal from the euro zone would come only as a last resort.

Syriza is calling for an end to austerity and for a fiscal stimulus of 11 billion euros along with restoring the minimum wage to its previous level, better pensions, rehiring civil

servants and increased public spending. Can a compromise be reached with the Troika? Nothing is less sure, and it is virtually certain that Syriza will have to revise its ambitions downwards. The Greek deficit has of course shrunk. The country ran a small primary surplus in 2014 and is expected to continue its fiscal consolidation policy in 2015-2016. But Greece must continue to borrow to finance the interest on the debt, to repay or renew the debt reaching maturity and to repay the loans from the IMF. To do this, Greece must rely largely on external aid. From the second half of 2015, the country will face a financing gap of 12.5 billion euros (19.6 billion euros if it does not get IMF assistance). Moreover, Greece's still fragile banks[1] are very dependent on access to the ECB's Emergency Liquidity Assistance Program (ELA), which allows them to obtain emergency liquidity from the Bank of Greece. If Greece rejects the reforms, a showdown with the Troika is likely. The ECB has already threatened to cut off the country's access to liquidity. In addition, the Troika is the main creditor of Greece, which however has a new bargaining point: to the extent that Greece borrows only what it needs to repay its debt, and not to fund its budget deficit, it could threaten its creditors with a unilateral default on payments, even if this is a dangerous game that could deprive it of access to market financing for many years to come.

It is precisely this issue of restructuring Greece's debt and a partial default that is being emphasized by Syriza and which will likely be one of the main post-election issues. Alexis Tsipras wants to cancel a portion of the public debt, to put a moratorium on interest payments, and to condition repayments on the country's economic performance. According to forecasts by the EU Commission and the IMF, Greece's public debt ratio is expected to fall from 175% of GDP in 2013 to 128% in 2020. However, the assumptions underlying this scenario are not realistic, *i.e.* nominal growth of more than 3% in 2015, a primary surplus of 4.5% of GDP between 2016 and 2019, etc.

Given the size of Greece's public debt in 2013 and its amortization profile (with reimbursements amounting to 13 billion euros in 2019 and up to 18 billion euros in 2039[2]), a new restructuring seems inevitable.

A public debt that is essentially held by euro zone countries

Since the onset of the Greek crisis in autumn 2009, the composition of the country's public debt has changed substantially. While in 2010, the debt was held by financial investors, the picture in early 2015 is very different [3]. After two assistance plans (in 2010 and 2012) and a restructuring of the public debt held by the private sector in March 2012 (Private Sector Involvement Plan), 75% of the public debt now consists of loans (**Table 1**). Together the IMF, the ECB, the national central banks and the countries of the Eurozone hold 80% of Greece's public debt.

Table 1. Breakdown of Greece's public debt, by holder, september 2014

In billion euros

	September 2014	As % of total debt
Total	**321,7**	**100**
Debt securities	**79,8**	**25**
Commercial paper (Short-term)	13,4	4
Treasury bills (Long-term)	66,4	21
By ECB and national central banks	*25,0*	8
By private sector	*41,4*	13
Loans	**241,8**	**75**
IMF	32,1	10
Greek central bank + domestic loans	4,4	1
Euro zone countries	194,8	61
From 1st assistance plan (Greek Loan Facility)	*52,9*	*16*
From 2nd assistance plan (EFSF)	*141,9*	*44*
Other loans and repos	10,5	3

Sources: Debt Management Agency, IMF, ECFIN, author's calculations.

Conversely, since the March 2012 restructuring plan, Europe's banks have sharply reduced their exposure to Greece's public debt (**Table 2**). Moreover, their capital levels have risen since 2010, especially with the gradual implementation of the Basel 3 reform. The banks thus have a safety margin in the case of a partial default by Greece.

Table 2. Exposure of banks to Greek debt (public and total)

In billions of euros

	Total Greek debt (public + private)			Greek public debt		
	Q3 2009	Q1 2012	Q2 2014	Q4 2010	Q1 2012	Q2 2014
Total banks	**430,5**	**105,6**	**73,8**	**62,9**	**9,0**	**3,5**
European banks	**389,2**	**99,1**	**47,8**	**60,2**	**8,3**	**2,2**
France	*112,4*	*54,7*	*3,0*	*20,3*	*2,5*	*0,1*
Germany	*61,8*	*8,3*	*18,9*	*20,0*	*1,0*	*0,2*
United Kingdom	*17,9*	*11,1*	*18,1*	*4,6*	*0,3*	*0,8*
Non-European banks	**NA**	**6,5**	**26,1**	**2,6**	**0,7**	**1,3**
United States	*27,8*	*5,1*	*24,6*	*2,0*	*0,6*	*1,3*

Sources: BIS, ECB, author's calculations.

Since more than half of Greece's public debt is held by members of the euro zone, no renegotiations can take place without their involvement.

So what are the possibilities for restructuring the debt?

The European countries have already made several concessions to help Greece service its debt:

– The maturity of the loans has been increased and the interest rate on loans granted by the EFSF has been reduced. For the first assistance program (bilateral loans), the initial maturity was 2026 (with a grace period until 2019) and the interest rate was indexed to the 3-month Euribor plus a risk premium of 300 basis points. In 2012, this risk premium was cut to 50 basis points and the maturity was extended by 15 years to 2041;

– Any profits made by the ECB and the national central banks on the bonds they hold were returned to Greece;

– Interest payments on the EFSF loans were deferred by 10 years.

Solutions like some used in the past could be implemented. The debt could be rescheduled. Indeed, the rate charged on the loans in the first assistance package (3-month Euribor + 50 basis points) is generally higher than the financing costs of

the European countries, and could be lowered. And the term of the loans in the first and second assistance packages could be extended by another 10 years, until 2051. According to the Bruegel think-tank, these two measures combined would reduce Greece's total repayments by 31.7 billion euros.

These measures nevertheless seem limited for resolving the issue of Greek debt: they only postpone the problem. Other measures are needed to relieve Greece of its public debt burden. As the euro zone countries are the main ones exposed to Greece's debt, they have an interest in finding a compromise: if there is a unilateral default, it is taxpayers throughout Europe who will wind up paying.

As for the IMF, there's no point waiting for debt forgiveness. The institution is indeed the senior creditor in case of a country's default, and lender of last resort. Since its founding, it has never cancelled a debt. It is therefore with the members of the euro zone, Greece's main creditors, that a partial default needs to be negotiated. On the one hand, Greece can threaten an uncoordinated unilateral default, causing losses for its creditors. But on the other, it has no interest in alienating euro zone members and the ECB, which have been its main supporters during the crisis. A sudden default would deprive it of access to market financing for many years; even if Greece has achieved a primary surplus, the situation is unstable and it still needs external financing, even if only to honour its repayments to the IMF. One solution would be for the euro zone countries to accept a discount on the face value of the government debt they hold, as was done with private investors in March 2012.

In conclusion, Greece is facing a series of challenges. In the short term, the priority is to find sources of financing to get through 2015. To do this, the country will have to deal with the Troika, in particular the ECB, whose action will be crucial. The Bank has warned Greece that if negotiations fail, it could cut off the country's access to liquidity.

Furthermore, on 22 January 2015, the ECB must reach its long-awaited decision on quantitative easing; the issue is whether the ECB will accept the redemption of Greek government bonds. In the longer term, the issue of restructuring the debt will inevitably arise, regardless of who wins the polls. However, the restructuring is likely to be easier with public creditors than with the private banks, if, that is, Greece has in turn won the trust of its European partners.

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[1] See the results of the stress tests published by the ECB on 26 October 2014.

[2]See the Hellenic Republic Public Debt Bulletin, no. 75, September 2014, Table 6.

[3] For a comparison with the situation in June 2012, see Céline Antonin, "Retour à la drachme: un drame insurmontable?", [Return to the drachma: an insurmountable drama?], *Note de l'OFCE* no. 20, June 2012.