

Household Debt and Domestic Demand: Greece versus other Euro zone Economies

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Abstract

Fast household debt growth over a prolonged period of time entails high gains for domestic demand while it lasts, but also severe losses in the event that it is interrupted. Over the period 2008-2011, the financial crisis and the sovereign debt crisis eliminated credit expansion to households in Greece and other Euro zone countries previously experiencing rapid household debt growth. The analysis presented in this paper suggests that this development caused a shift of the net injection contributed by household debt to domestic demand from the highly positive levels experienced up to then to levels considerably below zero. As a result, the role of household debt for domestic demand in these countries changed radically, from that of a major growth driver to that of a weakening factor.

Keywords: Household Debt, Domestic Demand, Credit Crunch

1. Introduction

Six years ago, at a time when Greece was experiencing fast GDP growth and rapid household credit expansion, a paper examining the prospects of household borrowing in Greece and its implications for growth claimed that in order to preserve the sustainability of Greece's household indebtedness, a substantial drop in the rate of growth of household debt would have to take place (Athanassiou 2007). As implied by a model presented in that paper, such a drop would cause a considerable weakening of the boost provided by household debt to the internal demand for consumption and housing investment. Since domestic demand increases were up until then Greece's main growth driver, the possibility of this weakening was argued to create concerns with regards to the overall growth prospects of the Greek economy.

In line with the predictions of the aforementioned paper, the rate of expansion of credit to Greek households receded gradually in 2006 and 2007 and dropped sharply in 2008, amounting to 12.8% in the latter year versus 31% in 2005. Thereafter, the financial crisis, the sovereign debt crisis and the consequent credit crunch brought household credit expansion to a halt, with the outstanding balance of household debt in 2010 and 2011 actually exhibiting decline. These developments constitute a complete departure from the rapid credit growth trend followed since Greece's financial liberalisation in the mid 1990s and, as such, they deserve to be studied with respect to their implications for domestic demand and output.

In view of the above, we hereby present fresh evidence on the impact of household debt on Greece's domestic demand, covering the period up to 2011 and focusing on the recent drastic transformation of the role of this debt from that of an important growth driver to that of a major weakening factor for demand. Furthermore, and as a guide for policy, we provide an indication of the minimum rate of credit expansion to households currently required in order for the net injection contributed by household debt to Greece's domestic demand to return to positive levels. Finally, we perform a similar up-to-date analysis for five more Euro zone economies, namely Germany, France, Italy, Ireland and Spain. These economies cover a variety of different patterns with respect to the evolution of household borrowing and its effects on demand, and therefore the study of their cases is both interesting in its own right and useful for the purpose of comparisons to the case of Greece.

2. Recent developments in Greece's domestic demand and household borrowing

During the period 2001-2007, a pattern of successive large increases in Greece's domestic demand led the country to a path of comparatively rapid GDP expansion, despite the mostly negative growth contributions of the external sector (see Figure 1). In 2008, this pattern was suddenly interrupted, with the momentum of domestic demand dropping sharply and the rate of change of the GDP turning negative. From 2009 onwards, a persistent severe contraction in domestic demand led the economy into a deep recession.

The weakening and subsequent decline of Greece's domestic demand reflects mainly a very substantial loss of strength of its two larger components, namely private consumption and gross fixed capital formation. Private consumption growth declined to 2.8% in 2008 from 4.5% in 2006 and turned increasingly negative thereafter, amounting to -7.5% in 2011. Gross fixed capital formation entered a path of very rapid decline from 2007 onwards, contracting by about 15% in 2009 and 2010 and by over 20% in 2011.

While the weakening of private consumption obviously corresponded to a loss of strength of household demand for consumer goods, the contraction of gross fixed capital formation was also chiefly a reflection of a decline in household demand, in this case for new housing. Housing investment, the largest component of Greece's gross fixed capital formation until recently, dropped by a cumulative 68.7% during the period 2007 to 2011, exerting by far the heaviest negative pressure on demand among capital investment categories and playing, thus, a crucial part in the economy's slide into recession.

From the above facts, it is evident that, so far, the deterioration of Greece's domestic demand and, hence, the downturn of the Greek economy, originate primarily in the weakening of household demand for consumer goods and new homes. This weakening coincided with a dramatic shift of the rate of growth of credit expansion to Greek households from highly positive levels to negative levels, as illustrated in Table 1. More specifically, the rate of expansion of Greek household debt receded gradually in 2006 and 2007 and dropped sharply in 2008 and 2009, amounting to 3.1% in the latter year versus an average of 33% over the period 2000-2005¹. In 2010 and 2011 household debt actually declined, with its outstanding balance subsiding by a total of 6.5 billion euro.

Although the deceleration of the rate of expansion of household debt experienced until 2008 was largely to be anticipated on the basis of the need to preserve debt sustainability, the subsequent severe cutback in borrowing came as a shock. On the supply side, the financial crisis and the sovereign debt crisis forced banks to cut back the availability of loans and to tighten credit terms, in view of the rise in credit risk and the need to control their exposure to bad debt. On the demand side, the uncertainty induced by the crises and the recession, coupled with the downfall in house prices experienced since the beginning of 2009, dampened the confidence of households and reduced their appetite for housing and consumer credit².

Leaving aside the causes of recent developments in household borrowing, the study of which is beyond the scope of this paper, an interesting issue to examine is the role that these developments may have played in the loss of strength of household demand for consumption and housing and, hence, in the weakening of Greece's domestic demand. In section 4 we examine this issue through an analysis that points to a recent rapid transformation of the role household debt from that of an important growth driver to that of a major weakening factor for demand. This analysis is based on the theoretical model of Athanassiou (2007, 2011), a summary of which, together with an illustration of its implications in the event of a credit crunch, follows below.

3. A model of the impact of household debt on domestic demand and its implications in the event of a credit crunch

Although household borrowing showed considerable growth in a number of developed economies over the past two decades, the macroeconomic implications of this growth have until recently attracted little attention³. Focusing on the impact of borrowing on domestic demand, two opposing effects may in general be identified: an expansionary effect arising from the increase in the debt and a contractionary effect stemming from the debt service on pre-existing and new loans.

¹ The rapid credit expansion of Greece's private sector over previous years, the corresponding decrease in private savings and the consequent aggravation of current account imbalances have been linked to the process of goods and financial market integration related to the country's accession to the EU (see e.g. Blanchard and Giavazzi, 2002).

² For a discussion of the role of supply and demand side factors in the recent developments in household borrowing, see Bank of Greece (2009b), Chapter VI.

³ For discussions of these implications, focusing on the effects of rising household debt on the exposure of households to shocks in income, house prices and interest rates, see Debelle (2004a and 2004b) and Girouard, Kennedy and André (2006). For a long-run view of the implications of rising household debt for the relationship between wages and aggregate demand, see Barba and Pivetti (2009). For a study of mutually reinforcing boom-bust cycles in housing and credit markets, enhancing the likelihood of future financial fragility, see Goodhart and Hofmann (2007). For a discussion the risks associated with excessive household borrowing in foreign currency see Barrell et al (2009).

Since households spend the funds raised through debt shortly after obtaining them, an increase in household debt within any year j may be assumed to have a nearly equivalent expansionary impact on that year’s domestic demand. In parallel, given that household borrowing creates an obligation for the payment of interest and hence an obligation for the cutback of expenditure in subsequent years, domestic demand in year j may be assumed to be negatively influenced by the debt burden accumulated by households up until the beginning of this year. On the basis of these assumptions, the net injection contributed by household debt development to domestic demand in year j may be expressed as:

$$\begin{aligned}
 I_j &= \text{change in debt} - \text{interest payments} && \Rightarrow \\
 I_j &= (S_j - S_{j-1}) - (\rho_j S_{j-1}) && \Rightarrow \\
 I_j &= S_{j-1} (1 + r_j) - S_{j-1} - \rho_j S_{j-1} && \Rightarrow \\
 I_j &= S_{j-1}(r_j - \rho_j) && (1)
 \end{aligned}$$

where S_j is household debt at the end of year j , r_j is the growth rate of household debt in year j and $\rho_j S_{j-1}$ is the sum of the interest payments paid by households in year j with $0 < \rho_j$. From equation (1) it follows that the evolution of I_j over a period of n years ($j=1, 2, \dots, n$), would be equivalent to:

$$\begin{aligned}
 I_1 &= S_0(r_1 - \rho_1) \\
 I_2 &= S_1(r_2 - \rho_2) = S_0(1+r_1) (r_2 - \rho_2) \\
 I_3 &= S_2(r_3 - \rho_3) = S_1(1+r_2) (r_3 - \rho_3) = S_0(1+r_1) (1+r_2) (r_3 - \rho_3) \\
 &\vdots \\
 I_n &= S_0(1+r_1) (1+r_2) \dots (1+r_{n-1}) (r_n - \rho_n) && (2)
 \end{aligned}$$

where S_0 is the outstanding debt at the beginning of year 1. In the case where $r_1 = r_2 = \dots = r_n = r$ and $\rho_1 = \rho_2 = \dots = \rho_n = \rho$ the value of I_j in any year j would be equal to:

$$I_j = S_0(1+r)^{j-1}(r-\rho) \tag{3}$$

The exponential form of relationship (3), combined with the condition that $I_j > 0$ only if $r_j > \rho_j$, suggests that the path of I through time depends critically upon the growth rate of credit expansion to households r , so that even relatively limited variations in r would be sufficient in order to alter radically the annual net injection contributed by household debt to domestic demand. Indicatively, given the levels of ρ applicable to Euro zone economies over recent years (see section 5), rates of credit expansion close to 30% (i.e. similar to those observed in Greece up to 2005) would yield a remarkable strengthening of domestic demand, while rates in the area of 20% would produce a comparatively much weaker positive effect.

Turning to consider the implications of a credit crunch for a country with a previous record of fast credit expansion to households, the first thing to observe on the basis of the above model is that such a development would amount to a major decline in r to a value close to or below zero. As a result of this decline, the condition $r_j > \rho_j$ would most likely no longer be satisfied and therefore I would be driven to a negative value. Intuitively, the crunch would eliminate the expansionary effect of borrowing, while leaving the obligations to pay interest on pre-existing debt intact, thus transforming household debt developments from an important growth driver to a weakening factor for demand. Importantly, the faster the rate of credit expansion to households prior to the crunch, the stronger this weakening effect would turn out to be, because, other things being equal, a record of faster credit growth translates to greater debt accumulation and hence to higher debt service obligations.

Before proceeding to examine the cases of Greece, France, Italy, Germany, Spain and Ireland by use of the above model, it should be noted that, although the model captures the essence of the importance that the speed of household credit expansion bears for domestic demand growth, it does not constitute a full representation of all potential channels through which household debt may influence demand. Furthermore, the model does not attempt to account for the potential relationships that may exist between household debt and interest rates or between past and present credit expansion rates and, therefore, while it suffices for the type of analysis carried out in this paper (i.e. for the calculation of I on the basis of the actual record of r and ρ), it may not be suitable for other applications.

4. An application to the case of Greece

On the basis of the above model, one would expect that, in the case of Greece, the sharp decline in r experienced from 2008 to 2011 would translate initially to a considerable decrease of the net injection provided by household debt to domestic demand and, eventually, to a drop of this injection to negative levels. To verify whether and to what extent this may be so, equation (4) has been employed for the calculation of the path of I from 2000 until 2011, using Greek annual data on the evolution of household debt and interest rates on this debt. Specifically, I_j was calculated by (i) setting S_0 as equal Greece's household debt at the end of year 1999, (ii) taking r_j as published by the Bank of Greece and reported in Table 1, and (iii) setting ρ_j as equivalent to the weighted average of the interest rates on outstanding housing loans and consumer & other loans, data on which are provided by the ECB and the Bank of Greece.

Figure 2 displays the evolution of I on the basis of the calculations just mentioned, illustrating also the corresponding increases in household debt, as well as the course of r and ρ . As evident from the figure, in 2008 the sharp drop in r and the consequent narrowing of its excess above ρ , drove the net injection contributed by household debt to domestic demand to less than half of its value in 2007. Notably, the value of I in 2008 was lower even to that of the year 2003, despite the fact that the increase of household debt in 2008 was in absolute terms much higher. This is essentially a reflection of the stronger contractionary effect of household debt on I , resulting from the continuous escalation of the debt burden of Greek households.

Turning to developments in 2009, Figure 2 illustrates a sudden shift in I from the highly positive levels experienced up to then, to a level considerably below zero. This shift was a reflection of the dip in r to a level much below ρ and suggests that, in that year, household debt developments started to exert a negative net injection to domestic demand, despite the fact that credit expansion to Greek households had not yet seized altogether. Concerning developments in 2010 and 2011, the transition to negative values of r exacerbated the adverse impact of household debt on growth, bringing about a further severe downfall in I .

The importance of the aforementioned movements in I for Greece's domestic demand and growth can be further appreciated by expressing I and the changes in household debt as shares of the GDP. In 2009, 2010 and 2011, I was estimated to about -1.6%, -3.6% and -5.3% of the GDP, respectively, versus 2.5% in 2008 and an average of 6.1% over the period 2005-2007. This indicates that, in the case of Greece, the role of household debt for domestic demand has been reversed from that of an important growth driver to that of a major weakening factor.

Considering the consequences of the above reversal for Greece's GDP, these appear to be rather serious particularly because, in the current recessionary environment, domestic demand is already under the pressure of several other negative factors (e.g. increasing unemployment, rising uncertainty). While under more favourable economic conditions, there could be significant forces at work helping to counterbalance the effects of a negative net injection from household debt, under the present circumstances such an injection acts to intensify the downfall of household demand related to the aforementioned factors, thus exacerbating the recession.

The above analysis and findings have important implications for government and bank policy that will be discussed in section 6 of the paper, once the cases of Germany, France, Italy, Ireland and Spain have also been examined. For now, a final question to consider with respect to the case of Greece relates to the minimum rate of credit expansion to households that would be required in order for the net injection contributed by household debt to Greece's domestic demand to return to positive levels. As suggested by equation (2), to satisfy the condition $I > 0$ the rate of credit growth r would have to be adjusted so as to exceed the corresponding level of ρ . Since over the past five years, Greece's ρ has remained within a range of 6.4% plus or minus 0.6%, an r towards the top of this range could be considered as sufficient to ensure a positive I in the medium term. However, it should be noted that, in the case of Greece, the future path of ρ is subject to considerable uncertainty, as it will depend critically upon the success of the Greek government's fiscal adjustment programme.

5. An application to the cases of other Euro zone countries

Following the above examination of household debt developments and their impact on domestic demand for the case of Greece, we now proceed to a similar analysis for the cases of France, Germany, Italy, Spain and Ireland.

Beginning with Ireland and Spain, the experience of which bears a higher degree of similarity to that of Greece, it is a well known and widely discussed fact that between 2000 and 2007 both countries went through a phase of very rapid credit expansion to households⁴. During this phase, and particularly over the period 2003-2007, the annual increases of their household debt, expressed for the sake of international comparisons as shares of the GDP, rocketed to levels much higher to those of Greece (see Figure 4), driving the Spanish and Irish household debt-to-GDP ratios to over 80% in 2007, from just about 40% in 2000 (see Figure 3). In 2008 Ireland's household debt growth sunk abruptly to negative levels, to remain negative thereafter. In Spain, a marked drop in the rate of credit expansion in 2008 was followed by negative credit growth in 2009 and then again in 2011.

On the basis of the above developments, one would expect that, similarly to the case of Greece, Ireland and Spain have also been through a sudden reversal of the role of household debt for domestic demand, from that of a major growth driver to that of a weakening factor. Indeed, as one may observe from Figure 4, which illustrates the path of I for the all countries examined on the basis of calculations⁵ using ECB and National Central Bank data on household debt and interest rates, in Ireland and Spain the switch from a positive to a negative net injection of household debt to domestic demand occurred even prior to that of Greece. Furthermore, in the case of Ireland, this shift was far more pronounced. Having relied to a high degree upon household borrowing for their growth over the past, and having thus accumulated large household debt burdens, Spain and, more so, Ireland faced both a sharp adjustment in household borrowing and high household interest payments, both leading to a very severe negative injection to demand in the face of the credit crunch.

Turning to France and Italy, credit expansion to households over the period 2000-2007 was much milder, resulting in a relatively moderate rise of their household debt-to-GDP ratios and a positive but comparatively modest net injection of household debt to domestic demand. Following the emergence of the financial crisis, none of the two countries avoided a temporary decline in household credit expansion and a consequent shift in the role of household debt for domestic demand from that of a growth driver to that of a weakening factor. However, given their record of modest borrowing over previous years, this shift was of a comparatively limited scale and hence of a much lower impact on growth.

A totally different pattern with respect to the evolution of household debt and its effects on demand is represented by the German case. Germany, having set off with a relatively higher debt-to-GDP analogy compared to the other economies hereby considered, was characterised by marginal or even negative credit expansion to households throughout the period 2000-2011, the result being a persistently negative net injection of debt to domestic demand. While in the German case, household debt has been exercising a weakening effect upon domestic demand for several years, this effect was not intensified in the course of the crisis, since a long record of stable household indebtedness implied no necessity for either banks or households to curtail household borrowing.

The above findings with respect to the evolution of net injection of household debt to domestic demand in different Euro zone economies lend support to the argument that faster credit growth to households entails much higher gains for domestic demand while it lasts, but also far more severe losses once a credit crunch emerges. Notably, further evidence on the existence of this link between household debt growth and demand appears to be provided by the actual behaviour of domestic demand in the economies considered, particularly during the course of the past few years. Although movements in domestic demand are influenced by many factors other than developments in household debt, the large discrepancies among these economies in the extent of the contraction of their domestic demand over the recession appear to be closely correlated to their differences with respect to the course of household borrowing. Ireland, Greece and Spain, which suffered the widest adjustments in borrowing and hence the most dramatic shifts from a positive to a negative I , also experienced the sharpest contractions in domestic demand (see Figure 5), while in France and Italy, where the fluctuations in credit expansion and hence the shifts in I were much milder, developments in domestic demand were less unfavourable. Since Germany, Italy, Spain and Ireland have all been found to be undergoing a negative injection of household debt to domestic demand, the question that remains to be considered in the framework of the present paper relates to the minimum rate of credit expansion r required in each country in order for this injection to return to positive levels.

⁴ For Ireland see e.g. Bank of Ireland (2005), Kelly, J. and Reilly, A. (2005), OECD (2009) and Law Reform Commission of Ireland (2009). For Spain see e.g. OECD (2008), Febrero and Dejuán (2009).

⁵ The methodology employed for these calculations is the same as the one described above for the case of Greece.

As implied by equation (2), this minimum rate corresponds for each country to a value just above its ρ , and therefore in a country with a relatively lower level of ρ the transition from a negative to a positive I could be achieved through a comparatively smaller percentage rise in household debt.

Even within the Euro zone, where policy interest rates are equal for all member countries, the level of ρ varies from one country to the other due to discrepancies in the interest rates charged by Monetary and Financial Institutions (MFIs) and/or due to differences in the proportion of consumer loans in total household debt. As ρ represents the weighted average of interest rates on outstanding housing loans and consumer & other loans, the more elevated the level of these rates in a particular country, due e.g. to an increased probability of default, the higher the level of ρ . Furthermore, as consumer loans carry in general higher interest rates compared to housing loans, the greater the proportion of consumer loans in total household debt the higher the level of ρ .

From Figure 6, which displays our calculations on the evolution of ρ in all the countries hereby considered on the basis of ECB data on household debt and MFI interest rates on this debt, it is evident that Germany, France, Italy, Spain and Ireland have all maintained throughout the period examined significantly lower levels of ρ in comparison to Greece. As illustrated in Figure 7, in 2011 Greece's ρ exceeded by about 0.7 percentage points that of Germany, 1.3 percentage points those of Italy and France, 1.7 percentage points that of Ireland and a whole 2.2 percentage points that of Ireland, the reason being Greece's relatively high interest rate on consumer loans, combined with a considerable analogy of these loans in total household debt.

On the basis of the above differences in the values of ρ among the countries examined, it follows that among the countries suffering a negative injection, the rate of credit expansion r required for this injection to return to positive levels is considerably higher in the Greek case. Most notably, in Ireland, where both interest rates on household loans and the ratio of consumer loans in total household debt are comparatively low, current interest rate levels allow for the severely negative injection of household debt to domestic demand to be corrected through a mild credit expansion to households amounting to slightly above 4%.

6. Conclusions and Policy Implications

Fast household debt growth over a prolonged period of time entails high gains for domestic demand while it lasts, but also severe losses in the event that it is interrupted. Over the past four years, the financial crisis and the sovereign debt crisis induced sharp drops in the rates of credit expansion to households in Greece and other Euro zone countries previously experiencing rapid household debt growth. As suggested by the analysis presented in this paper, these drops caused the net injection contributed by household debt to domestic demand to shift from the highly positive levels experienced up to then to levels considerably below zero, thus changing radically the role of household debt for domestic demand in these countries, from that of a major growth driver to that of a weakening factor.

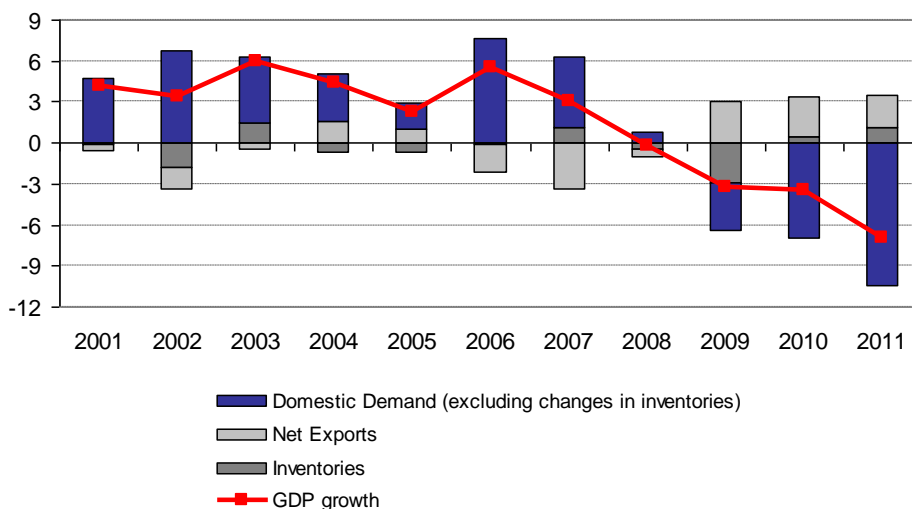
The negative injections currently inflicted by household debt to domestic demand in countries of the Euro zone periphery has serious consequences for economic growth, particularly because of the fact that, under the current recessionary environment, domestic demand is already under the pressure of other negative factors. Importantly, as government spending is contracting in these countries, in line with their fiscal adjustment programmes, the effects of household debt stagnation on domestic demand are more severely felt.

An important implication of our conclusions with respect to the minimum rates of credit expansion required in order for the aforementioned net injections of household debt to domestic demand to return to positive levels is that, in the case of Greece, the relevant rate would be considerably higher compared to the other Euro zone economies hereby examined. The reason for this discrepancy, which renders Greece's exit from the current state of a negative impact of household debt developments on demand more challenging, lies with the country's considerably higher interest rates on consumer loans and its relatively elevated analogy of these loans in total household debt. The above conclusions with regard to the impact of recent developments in household debt upon domestic demand have important implications for government policy. The decisive role of interest rates in determining the size of the contractionary effect of debt service on demand, calls for policies conducive to the containment of the cost of household credit, particularly in the case of Greece, where, as mentioned, interest rates have been kept higher compared to other Euro zone countries. The success of fiscal adjustment programmes in Greece, Spain, Italy and Ireland would, among other benefits, make a crucial contribution to this direction, by delivering a reduction in spreads and a rise in credit ratings for these countries.

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Figure 1
Real GDP growth in Greece and contributions to growth (%)



Sources: National Accounts of Greece.

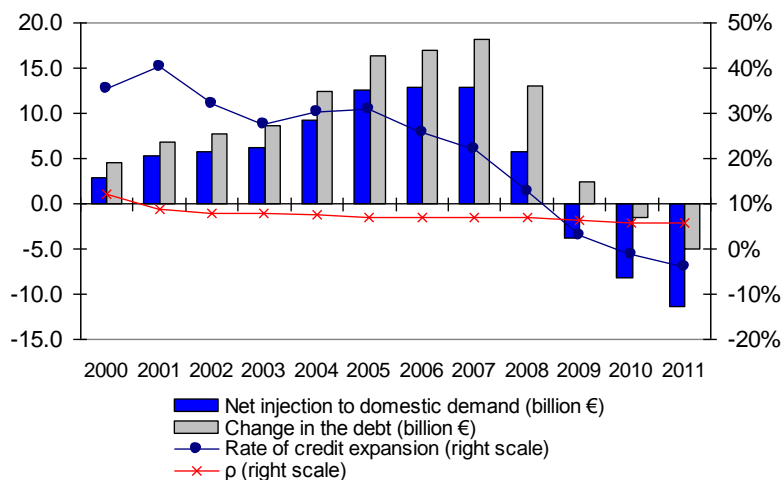
TABLE 2: Analysis of domestic MFI loans to domestic households (current prices, end of period)

	Housing Loans			Consumer & Other Loans			Total		
	Balance (bn €)	% Change	% of GDP	Balance (bn €)	% Change	% of GDP	Balance (bn €)	% Change	% of GDP
1999	8.6			3.9			12.5		
2000	11.3	31.2%	8.3%	5.7	46.9%	4.2%	17.0	35.5%	12.5%
2001	15.7	38.9%	10.7%	8.2	43.8%	5.6%	23.8	40.4%	16.3%
2002	21.2	35.6%	13.6%	10.3	26.0%	6.6%	31.5	32.2%	20.1%
2003	26.5	26.2%	15.4%	13.7	38.0%	7.9%	40.2	28.5%	23.3%
2004	34.1	27.6%	18.4%	18.5	36.2%	10.0%	52.6	30.4%	28.4%
2005	45.4	33.0%	23.5%	23.5	27.6%	12.2%	68.9	31.0%	35.7%
2006	57.1	26.3%	27.4%	28.7	24.4%	13.8%	85.9	25.7%	41.1%
2007	69.4	21.9%	31.1%	34.8	23.5%	15.6%	104.1	22.4%	46.7%
2008	77.7	11.5%	33.4%	39.5	15.5%	17.0%	117.2	12.8%	50.3%
2009	80.6	3.7%	34.8%	39.1	1.8%	16.9%	119.6	3.1%	51.6%
2010	80.5	-0.3%	35.4%	37.6	-3.2%	16.5%	118.1	-1.2%	52.0%
2011	78.4	2.9%	36.4%	34.7	-6.2%	16.1%	113.1	-3.9%	52.6%

Source: Bank of Greece.

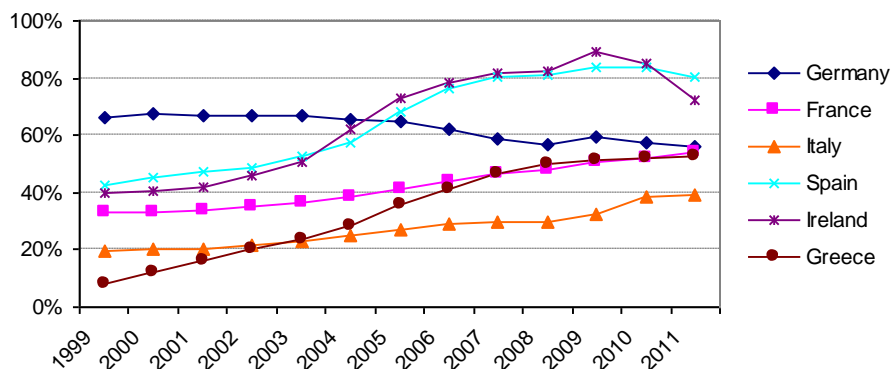
Note: Rates of change are calculated taking into account loan write-offs, exchange rate variations and reclassification adjustments.

Figure 2: Net injection contributed by household debt to domestic demand (I_j), change in the debt ($S_j - S_{j-1}$), rate of credit expansion to households (r), and interest rate on outstanding loans (ρ)

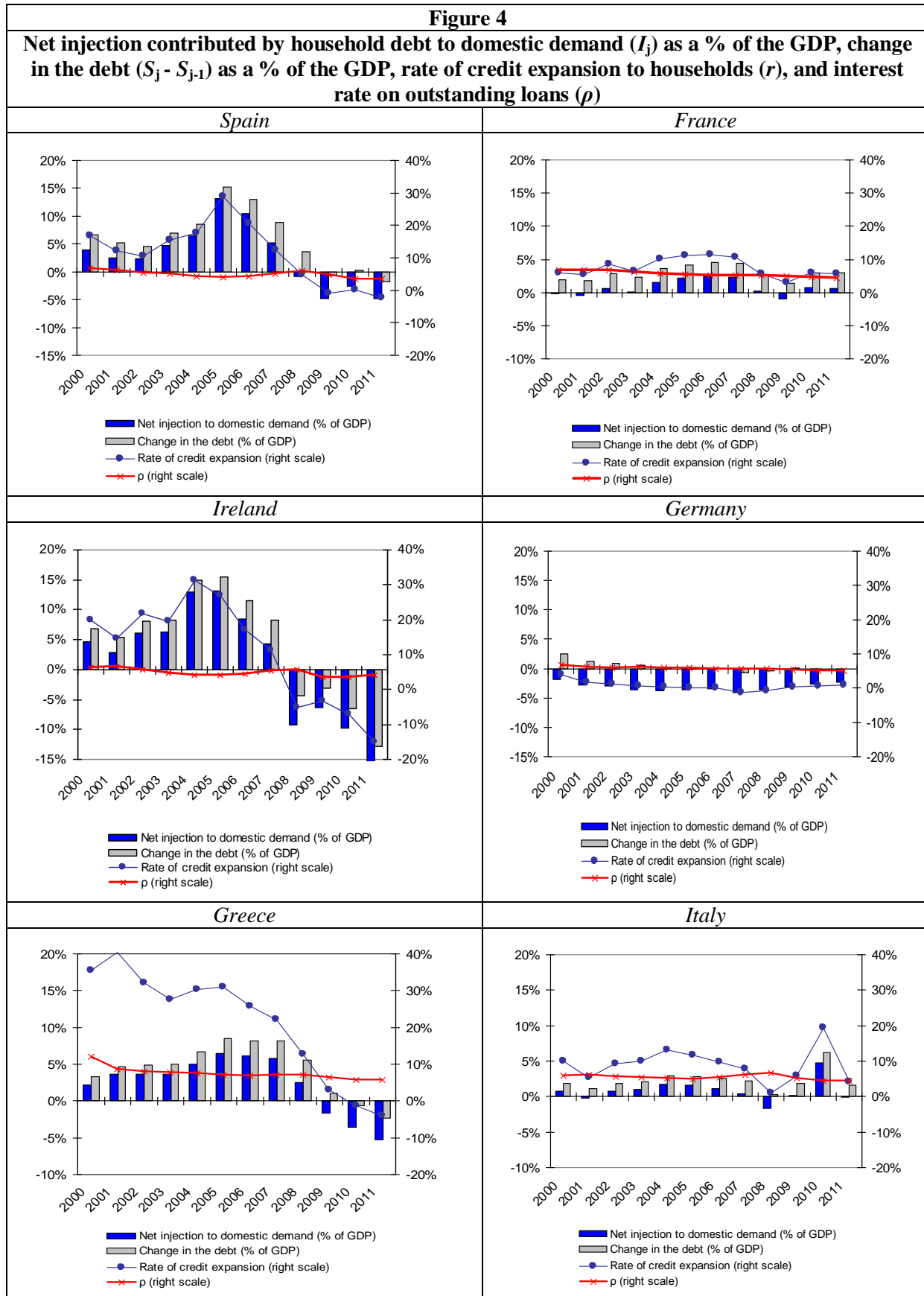


Source: Bank of Greece and own calculations.

Figure 3: Household debt-to-GDP ratio (%)

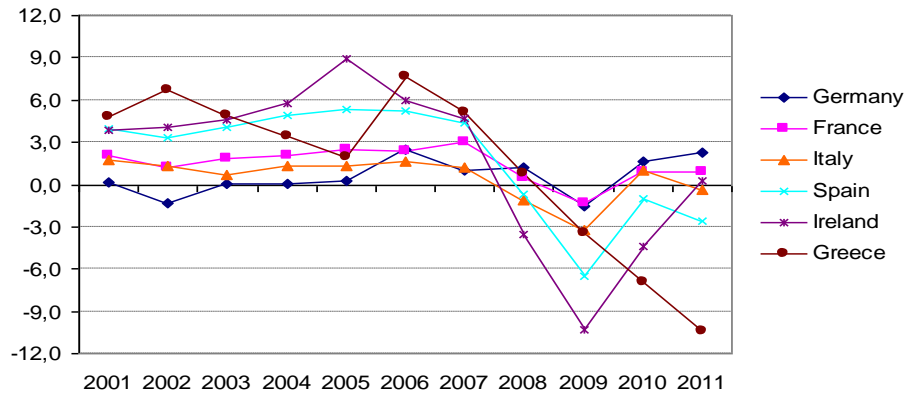


Sources: ECB, Eurostat.



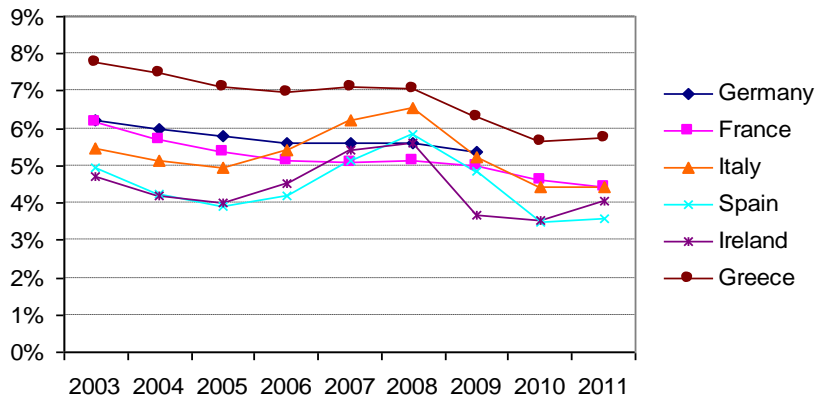
Source: Own calculations on the basis of (i) household debt and MFI interest rate data taken from the ECB and National Central Banks and (ii) National Accounts Data taken from Eurostat.

Figure 5: Contribution of Domestic Demand to GDP Growth (percentage points, excluding changes in inventories)



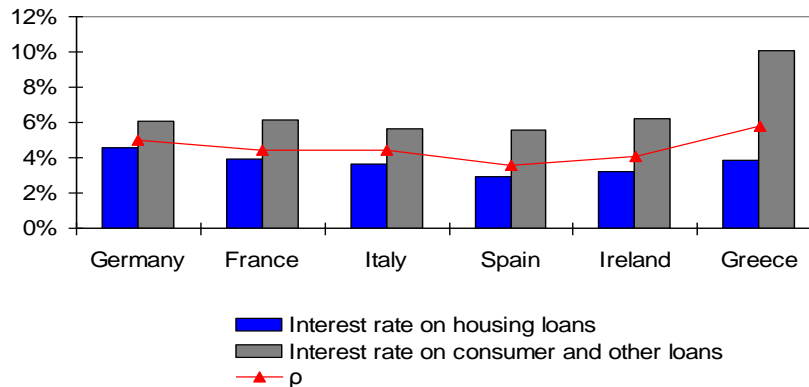
Sources: Eurostat. European Commission forecasts, autumn 2009.

Figure 6: Interest rate on outstanding household debt ρ



Source: Own calculations on the basis of household debt and MFI interest rate data taken from the ECB's Statistical Data Warehouse.

Figure 7: ρ and MFI interest rates on outstanding housing loans and consumer & other loans (2011)



Source: ECB's Statistical Data Warehouse and own calculations.