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# A sectoral net lending perspective on Europe

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# A sectoral net lending perspective on Europe<sup>1</sup>

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## Abstract

The paper investigates net lending and net borrowing flows of the institutional sectors in Europe since the introduction of the Euro in 1999. Applying a simple statistical apparatus, this paper is novel in describing the sectoral behavior leading up to and during the crisis. We find that (1) many countries of the Northern group were characterized by low public deficits or even budget surpluses, current account surpluses and a private sector in a net lending position. In countries of the Southern periphery, in the Anglo-Saxon countries as well as in many Eastern European Economies private sector net borrowing coincided with a budget deficit and substantial current account deficits. (2) With the onset of the crisis private net lending soared in all countries while all governments incurred deficits, consistent with the notion of a *balance sheet recession*. (3) Private net lending is pro-cyclical, reinforcing the economic downturn, while public net lending is countercyclical in all countries. (4) Household net lending tends to lead the business cycle, while corporate net lending tends to lag it especially in the Northern group. (5) Prominent concepts asserting causal relationships in sectoral net lending, such as *Ricardian equivalence* and the *twin deficit hypothesis* are not supported by the data.

*Key Words:* net lending and net borrowing, Euro crisis, Ricardian equivalence, twin deficit, current account imbalances

*JEL Classifications:* E12, F34, F45

## 1 Introduction

Many economic theories as well as policy responses to the Euro crisis implicitly make assumptions about sectoral behavior, in particular about the net lending and net borrowing flows of households, non-financial corporations, financial corporations, the government and the rest of the world. For Neoclassical economists the Euro Crisis is predominantly a sovereign debt crisis, caused by lax fiscal policy of untrustworthy governments, and much of the debate revolves around the impact of sovereign debt levels on growth (see e.g. (Reinhart and Rogoff, 2010)), while Keynesian macroeconomists have emphasized current account imbalances as the cause of the Euro crisis (see e.g. Flassbeck & Lapavistas, 2013). The discussions of the crisis, both mainstream and heterodox, thus implicitly differ over the net borrowing flows of one particular institutional sector. These views of the macroeconomy and its institutional sectors bear the risk of being one-sided. In addition, many prominent concepts such as the *twin deficit hypothesis* or *Ricardian equivalence*, which latently feature in recent calls for austerity (Laski and Podkaminer, 2012), boil down to assertions about causal relationships between sectoral net lending and net borrowing flows. We propose an integrated analysis taking into account all five sectors.<sup>2</sup>

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<sup>2</sup> The macroeconomic behavior of the institutional sectors is one of the main questions in economics since the invention of the system of national accounts by Richard Stone and James Meade in 1941 (Great Britain Treasury, 1941), a system eventually tracing back to John Maynard Keynes' (Keynes, 1936) elaboration that aggregate saving is equal to aggregate investment<sup>2</sup>, or put differently, that national income can be identified with national output. These ideas are also found in earlier works of American Institutionalists such as Wesley Clair Mitchell and Colin Clark

Changes in the national accounts introduced with the European System of Accounts 1995 allow a data-driven perspective: a statistical analysis of the net lending flows of institutional sectors, especially of processes leading up to the Great Recession and its effects on sectoral rebalancing across the EU.

In the following, we set out to describe these developments in sectoral net lending and net borrowing in Europe with an emphasis on four structurally important economies: Germany, Great Britain, France and Spain. After a brief descriptive analysis of historical trends we apply a simple statistical apparatus to shed light on the cyclicity of net lending flows and study structural relationships between the sectors' net lending and net borrowing. Finally, we derive policy recommendations for a sustained and balanced recovery.

## 2 The Euro crisis from a net lending perspective - five sides of the same coin

Net lending and net borrowing are derived from the national accounts, guaranteeing that adding up-constraints imposed by the *mechanism of net balances*, as coined by Wolfgang Stützel (1978), are satisfied. Each sector  $i$  receives an income  $Y_i$  and has an expenditure  $E_i$ . Equally, each sector undertakes investments  $I_i$  and savings  $S_i$ . The difference between income and expenditure or, put differently, between investment and saving is the net financing need of sector, i.e. net lending. Net lending can thus also be understood as the net change of financial assets  $\Delta A_i$  and financial liabilities  $\Delta L_i$  and is the balancing item of the non-financial with the financial accounts.<sup>3</sup>

$$NL_i = Y_i - E_i = S_i - I_i = \Delta A_i - \Delta L_i = -NB_i$$

With positive net lending, a sector provides lending to the rest of the economy. With negative net lending (positive net borrowing) a sector borrows resources from the rest of the economy. Since in the aggregate, lending needs to match borrowing, the sum of all sectors' net lending and net borrowing must equal zero:  $\sum_i NL_i = 0$ . Barbosa-Filho et al. (2008) use this framework to show that connections of public and foreign sectoral net lending congruent with the *twin deficit hypothesis*, which is often cited for the US, can only be observed infrequently. They further find that in the US private sector net lending and net borrowing is pro-cyclical, with household net borrowing usually leading the business cycle and business net borrowing tracking or lagging it, while the government behaves counter-cyclically.

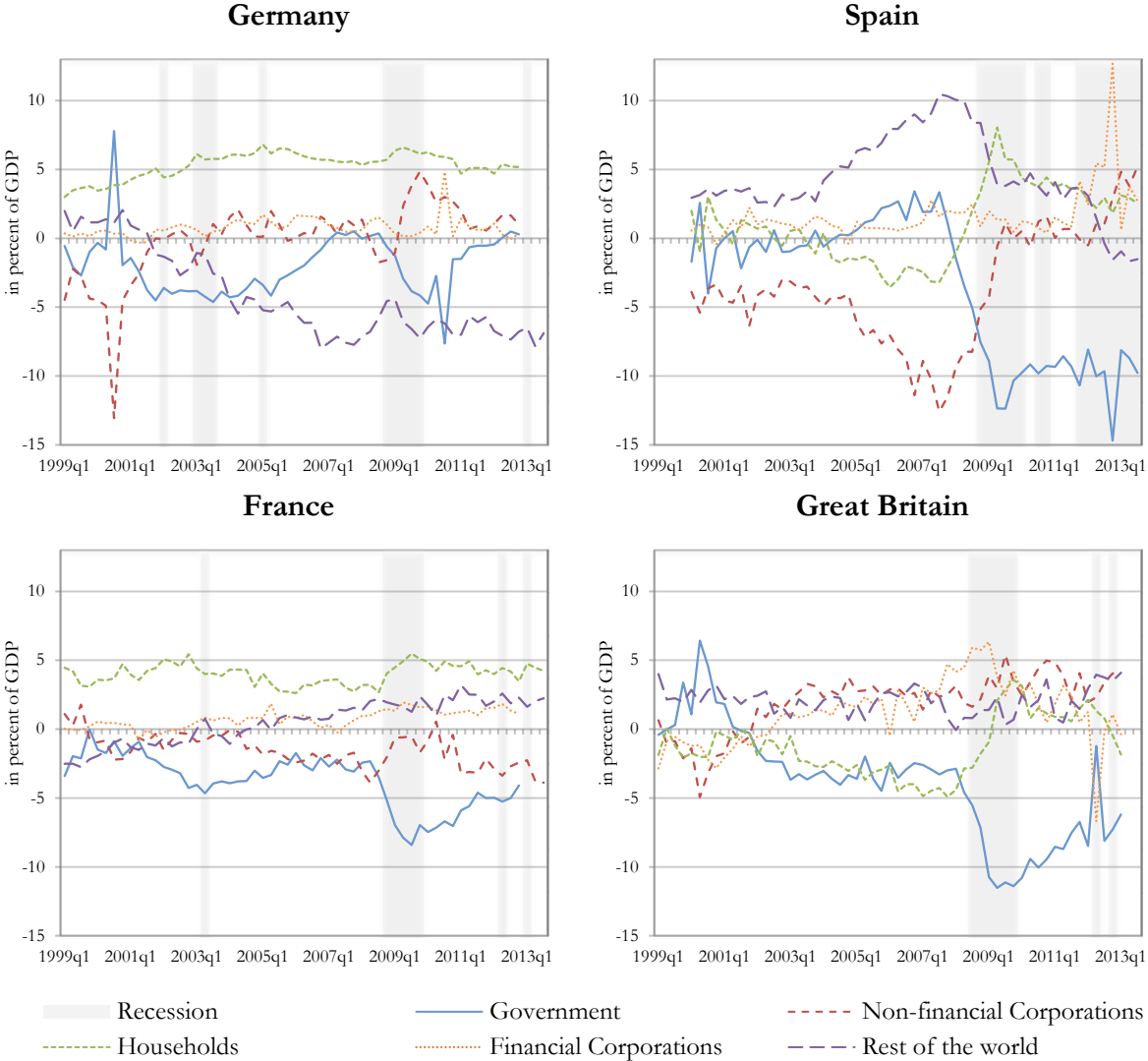
We start our analysis by presenting the net lending (+) and net borrowing (-) flows of the five institutional sectors (households, non-financial corporations, financial corporations, government and rest of the world) for Germany, Great Britain, France, and Spain, jointly comprising about

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(Mirowski, 1989) and ultimately go back to Venetian double-entry bookkeeping, invented in the twelfth century and was later in 1494 systematically reviewed in the famous '*Summa de arithmetica geometria proportioni et proportionalita*' by the Italian monk and mathematician Luca Pacioli (Chatfield and Vangermeersch, 1996).

<sup>3</sup> The equivalent concept in the financial accounts is 'net financial transactions'. In the following data from the non-financial accounts will be used due to its consistency with saving and investment. Where not available, we will resort to data from the financial accounts, though deviations between the calculations in the two accounts can be substantial. A detailed overview over the data provenance for each country can be found in the appendix.

60% of EU output, between 1999 and 2013 in percent of GDP.<sup>4</sup> Shaded areas indicate periods with negative year-on-year growth of real GDP to visualize recession periods.



**Figure 1: Net lending (+) and net borrowing (-) flows (in percent of GDP) for 1999-2013 for households, non-financial corporations, financial corporations, government, and the rest of the world. Net lending flows exhibit large heterogeneity across countries.**

The first observation in figure 1 is the apparent absence of common macroeconomic dynamics across countries. This is remarkable as France, Germany, and Spain have been exposed to the same monetary policy and prior to 2007 a large literature has argued for convergence among Euro members (see Carvalho and Harvey, 2005).

The upper left panel depicts Germany’s sectoral net lending and net borrowing flows. As is commonly known, Germany’s current account surplus (i.e. negative net lending or positive net borrowing of the rest of the world) has been increasing since the introduction of the Euro in 1999. Net borrowing peaked at around 7 percent of GDP before the crisis and fluctuated around this level since. In absolute terms, these cumulative current account surpluses amounted to over 1,5

<sup>4</sup> We seasonally adjusted the data presented throughout this paper using the US Census Bureau’s X-12 ARIMA additive method.

trillion Euros between the year 1999 and 2013 (European Central Bank, 2014). German households have been stable net lenders to the rest of the economy at around 5 percent of GDP throughout. Non-financial corporations are, traditionally, net borrowers, using funds provided by the household (and sometimes foreign) sector to finance investment. German non-financial corporations, however, shifted from a net borrowing position during the early 2000s to a net lending position (peaking at 5 percent of GDP) during the ongoing Great Depression, mirroring relative shifts in profitability of firms and their reluctance to invest. Germany's public deficit, i.e. negative government net lending or positive net borrowing, has been falling due to welfare reforms and good economic growth and reached a balanced budget prior to the Great Recession. Despite some government stimulus, automatic stabilizers, and the cost of saving the financial system, the government returned to a budget surplus, i.e. positive net lending, in 2012. The financial corporations sector usually plays a limited, passive role, with the exception of 2010q3 where its net lending rose to nearly 5 percent in the context of German banking packages.

Spain (upper-right panel), in contrast, experienced a mirror-image increase in its external deficit from around 3 percent of GDP in the early 2000s to staggering 10 percent in 2008. The ongoing recession and Spain's depressed import demand have helped boost net exports to a trade surplus in 2013. Prior to the crisis, households and non-financial businesses were engaging in persistent and significant net borrowing which peaked at 3 and 11 percent, respectively. Government was acting prudently by running a budget surplus while other domestic sectors engaged in a spending spree. The crisis introduced a structural break in the macroeconomic dynamics, just as the property bubble had before. With the onset of the crisis, households reduced their consumption and their position moved from net borrowing of 3 percent to net lending of 8 percent of GDP -- a change of 11 percentage points -- within two years. The shift in non-financial business net borrowing was even more drastic, moving from borrowing 12 percent to lending 1 percent of GDP. While the household net lending has been falling since the onset of the crisis, presumably due to falling incomes, non-financial net lending has increased further to 5 percent in recent years. Large increases in public deficits is the obvious counterpart to the development in household and non-financial corporate net lending. These pre- and post-crisis macroeconomic dynamics are well-known in the literature. They are worth highlighting, nonetheless, as they differ strongly from the developments in Germany (and the other countries discussed below). The policy debate on the causes of the Euro crisis mentioned in the introduction ultimately reduces to the question which of the institutional sectors is active and which accommodating. In Neoclassical lore, the government is the culprit who disturbs stable equilibria through its imprudent policy. To Keynesians, the public sector is the spender-of-last-resort who takes on the role of propping up demand when all other sectors find it prudent to reduce debt levels through net lending, which seems more plausible in light of recent Spanish data.

France's net lending dynamics are the most balanced with pre-crisis magnitudes fluctuating within a 10 percent band. Its external balance has been moving from a 2 percent surplus to a 2 percent deficit since the onset of the Great Recession. The French household sector behaved similarly to Germany's with households saving around of 5 percent of GDP per year over the whole period. These savings were used by non-financial business and the government to fund their expenditure. The crisis led to the well-known effects of an increase in lending (or reduction in borrowing) from households and non-financial business and an increase in government expenditure and the public

deficit of 6 percentage points, of the same magnitude as Germany's increase, was, arguably, too little to return the economy to sustained output growth.

Great Britain is a special case in many regards, not least as it is not a member of the Euro zone and its financial sector has a considerable impact on the macroeconomy. Great Britain has been running an external deficit averaging between 2-4 percent of GDP since 1999. Government balance has been in deficit, averaging at the same magnitude for most of the pre-crisis period. The same is true for households, whose net borrowing has been steadily increasing to around 5 percent prior to the crisis. Non-financial and financial corporations have been traditional net lenders to the UK economy, in contrast to France and Germany but in line with developments in Spain. The crisis led to a big reversal in the households' position, increasing lending by 9 percentage points to 4 percent of GDP. The public deficit plummeted by about the same magnitude, mimicking the developments in Spain. While Spain's economy is still in depression, economic growth has been picking up in Great Britain due to the relative constancy of non-financial corporate net lending and households' return to net borrowing, albeit hampered by the modest government austerity drives. The large uncertainty surrounding the 'Brexit' referendum is likely to lead to a postponement of investment decisions, renewed increases in private net lending, and a depression of aggregate demand.

The recent macroeconomic dynamics of France, Germany, Spain, and Great Britain illustrates how idiosyncratic over 60% of the European economy remain. Clustering is difficult but economies undergoing a property boom, i.e. Spain and Great Britain, seem to exhibit household sectors with less prudent finances. A general feature, however, is the mutually offsetting relationship between the public sector and the private sector (mostly household and non-financial corporations) during the crisis. This relationship has been central to macroeconomics since its very beginning and to policy debate in Europe more pronouncedly in recent years where it has been framed in terms of deleveraging.

### **Balance sheets, Deleveraging, and Austerity – Higher private net lending and public net borrowing**

The reduction in private demand in economic down-swings is a well-known fact and economic explanations are abound: Keynes argued along the lines of animal spirits and bear-speculators and for Minsky (1986) tighter lending standards by banks lead to lower investment demand. Koo (2008, 2013) classifies recessions into different category and, invoking Keynes' and Fisher (1933) arguments about the *paradox of thrift* and *debt-deflation*, introduces the concept of a *balance sheet recession*, in which private sector asset (debt) considerations – accumulated past net lending (borrowing) streams valued at current prices – dominate the sector's behavior. According to Koo, economic agents become concerned about their debt-to-income or debt-to-equity levels which usually worsen drastically when an asset price bubble bursts. Households and businesses prefer savings to pay down debt over consumption and investment which, in turn, reduces aggregate demand and worsens economic prospects further. To make matters worse, in an economy with severe debt overhangs gets caught in a liquidity trap: the interest rate policy becomes ineffective as debtors are reluctant to borrow regardless of the prevailing interest rate. Gächter et al. (2015a) show that the investment and saving behavior of households and businesses follows patterns consistent with such a *balance sheet recession*, especially in the crisis-struck periphery of Europe. In a

vicious circle, companies have been hoarding cash due to the crisis and find little prospects for profitable investment as the overall economic situation remains in a slump caused in part by their own reluctance to invest. Micro-data evidence on corporate investment confirms this observation (Gächter et al., 2015b; Task Force of the Monetary Policy Committee of the European System of Central Banks, 2013).

The private and public net lending dynamics since 2008 in figure 1 are broadly consistent with the notion of a Koo's *balance sheet recession*. Table 1 presents an overview of mean government, private and foreign net lending for the period prior to the crisis (2004q1-2008q2) and after the Lehman crash (2008q3-2013q1).

	Government		Private		Rest of the world	
	2004q1 - 2008q2	2008q3 - 2013q1	2004q1 - 2008q2	2008q3 - 2013q1	2004q1 - 2008q2	2008q3 - 2013q1
AT	-1.4	-3.0	4.8	5.4	-3.4	-2.3
BE	-0.8	-3.8	4.5	4.6	-3.7	-0.8
CZ	-2.3	-4.2	-0.9	2.7	3.2	1.5
DE	-1.9	-1.8	7.9	8.0	-6.0	-6.3
DK	4.1	-2.2	-1.2	7.2	-2.9	-5.0
EA	-1.8	-4.7	2.0	4.8	-0.2	-0.1
EE	1.9	-0.9	-13.7	3.4	11.7	-2.5
ES	1.0	-9.6	-8.6	6.2	7.6	3.5
FI	3.9	-1.7	0.8	1.9	-4.7	-0.3
FR	-2.9	-6.0	2.2	3.8	0.7	2.0
GB	-3.2	-8.4	1.3	6.3	1.9	2.1
GR	-7.0	-11.2	-5.1	1.7	12.2	9.5
HU	-6.9	-2.1	-1.6	2.1	8.6	0.0
IE	0.6	-15.1	-4.4	15.3	3.3	-0.2
IT	-3.2	-3.9	2.1	1.7	1.1	2.3
LT	-0.6	-6.0	-6.7	6.9	7.4	-0.9
NL	0.2	-3.9	7.3	9.3	-7.5	-5.4
PL	-3.5	-5.8	-0.3	3.3	3.9	2.4
PT	-4.3	-7.6	-4.5	1.2	8.7	6.3
SE	2.2	-0.2	5.1	7.2	-7.6	-7.0
SI	-1.2	-5.5	-2.7	5.5	3.3	0.0
SK	-1.3	-5.0	-5.7	0.4	7.0	4.6

**Table 1: Net lending of the Government, the Private sector and the Rest of the World before and after the Lehman crash. Sectoral net lending differed strongly across countries before the crisis. After the crisis private sector net lending and public sector net borrowing increase sharply.**

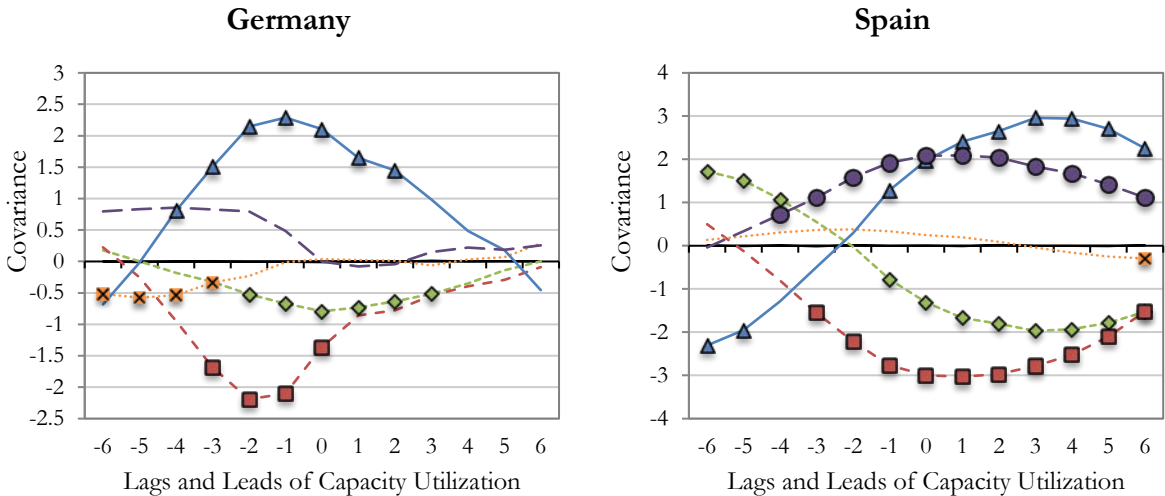
Before the crisis, a third of the countries governments maintained a budget surplus, including the Scandinavian countries, the Netherlands, Ireland, Estonia and Spain (first column). At the same time the private sector in this period was in a net lender in countries usually attributed to the 'Northern' group (AT, BE, DE, FI, NL, SE) as well as in France, Great Britain and Italy (third column). The private sector was a net borrower in countries of the 'Southern periphery' (ES, GR, PT) as well as Ireland and many Eastern European economies (CZ, EE, HU, LT, PL, SI, SK). Denmark is the only Northern country in this category. External balances are shown in columns 5 and 6, with pre-crisis balances ranging between -12.2 percent of GDP in Greece and surpluses of 7.5 and 6 percent in the Netherlands and Germany, respectively. It is interesting to note that private sector net lending pairs with current account surpluses (and vice versa) in all countries except France, Great Britain, Italy and Denmark.

The response to the Great Recession was similar in all countries, despite previous heterogeneity. Private sectors moved (further) into net lending positions and public net borrowing increased.<sup>5</sup> This deleveraging effort of the private sector was largely driven by a sharp decline in investment in deficit countries, also contributing to a convergence of the extrema in current accounts. The resulting decrease in aggregate demand, however, further reinforced the recession and the deflationary environment, thereby also increasing the real debt burden (Gächter et al., 2015a).

### 3 Net lending and net borrowing over the business cycle

Net borrowing and lending of each sector determine and are affected by the level of aggregate demand. In the previous section we focused on trends prior and during the Great Recession. Here we apply a simple statistical apparatus to study dynamics over the business cycle more generally. We follow the approach of Barbosa-Filho et al. (2008) which utilizes the inherent adding-up constraint for the sum of net lending and net borrowing flows. This constraint also extends to the sum of the covariances of the net lending and net borrowing with capacity utilization. Specifically, we study the covariances between sectoral net lending and net borrowing series, normalized by GDP, and six leads and lags of capacity utilization to identify indicators for the business cycle. Since covariances cannot be considered (in)significant as such, we report the significance of the associated correlation coefficients wherever possible.<sup>6</sup> Following Barbosa-Filho et al. (2008), we define capacity utilization as the deviation of real GDP from its trend, where Trend Real GDP is calculated using the Hodrick-Prescott filter.<sup>7</sup>

Figure 2 illustrates the covariances for net lending with dated levels of capacity utilization for Germany, Great Britain, France and Spain. A negative covariance indicates a pro-cyclical net lending behavior of a sector, in this sense it reinforces the business cycle. A positive covariance, as mostly observed for the government sector, indicates a counter-cyclical behavior, dampening the business cycle. Leads and lags of capacity utilization are plotted along the x-axis. Markers (diamonds, squares, triangles...) indicate a significance of the associated correlation coefficient at the 10 percent level.

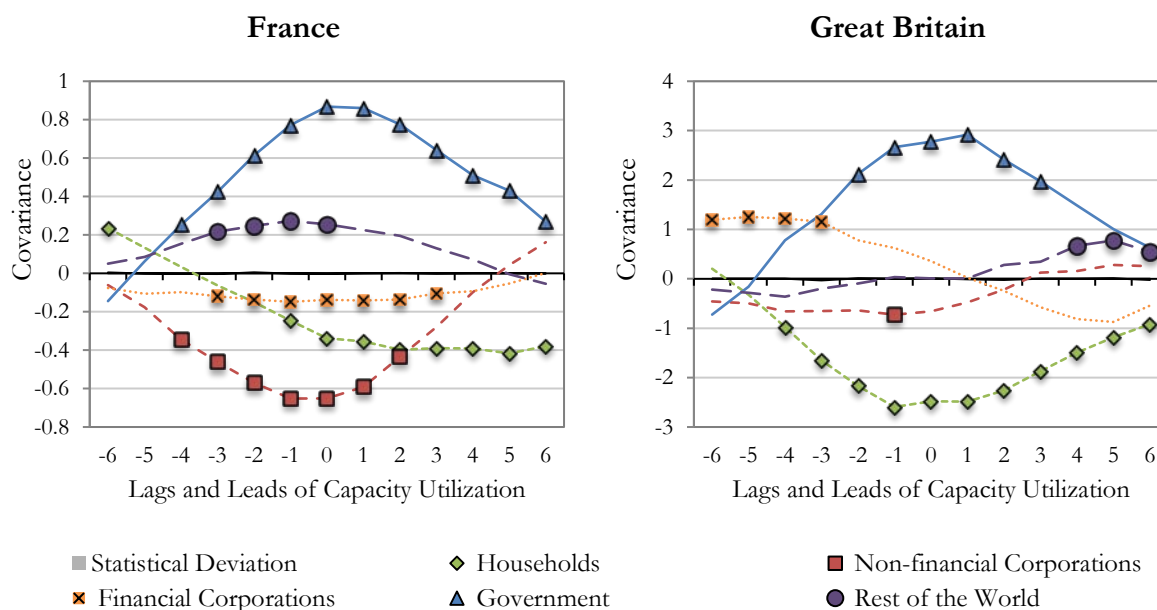


<sup>5</sup> Trends in Italy, Hungary, and Germany diverge partly from this pattern.

<sup>6</sup> See the statistical online appendix for details and derivations.

<sup>7</sup>  $Capacity\ Utilization = (real\ GDP / Trend\ real\ GDP - 1) * 100$ , implying an average utilization rate of 0.





**Figure 2: Covariances between net lending and net borrowing and leads and lags of capacity utilization. Positive values on the x-axis correspond to future levels (leads) of capacity utilization, negative values to past levels (lags). Public net lending is counter-cyclical, private net lending is pro-cyclical.**

In all four countries government net lending's covariance with the cycle is strongly positive and significant, indicating a counter-cyclical behavior in line with the observations made in the previous sections. In Germany government net lending is offsetting all other sectors. The biggest counterparts are non-financial corporations followed by households. The private sector behaves pro-cyclically, net borrowing more during the boom than during economic downturns. The picture is similar in France with the difference that household net lending is significantly leading the cycle. In Spain the government and the rest of the world exhibit an equally strong positive covariance with capacity utilization at the zero lag, while also here the private sector behaves pro-cyclically, business to a larger extent than households. Great Britain differs from the other countries in that at current levels of capacity utilization government and household net lending's covariances are offsetting each other almost entirely. The remaining sectors are of minor importance. These observations are consistent with Steindl's analysis (1990, Chapter 14) that while the conventional view, expressed in the *Ricardian equivalence* framework, would assume that net borrowing of households would further increase in a crisis in order to be able to keep the consumption level stable, it is more plausible that households will buy significantly less durable consumer goods and reduce residential investment. These are mainly debt financed and make up a significant part of total expenditure. According to Steindl, the change in demand for these goods reacts more than proportionally to changes in disposable income.

The sequencing of sectoral net lending and the business cycle is shown in Table 2. Asterisks indicate changes between current levels of capacity utilization and past or future levels in at least one of the robustness checks. There are no changes in either sign of the covariance or switches in the lead/lag relationship across robustness checks.

	Households	Non-financial Corporations	Financial Corporations	Government	Rest of the World
<b>CZ</b>		<b>Lead</b>		<b>Lead</b>	
<b>DE</b>	o	Lag	Lag	Lag	
<b>DK</b>	<b>Lead</b>	Lag	<b>Lead</b>	o	Lag
<b>EA</b>	<b>Lead</b>	Lag		o	Lag
<b>ES</b>	<b>Lead</b>	o		<b>Lead</b>	o
<b>FI</b>	o	Lag		o	
<b>FR</b>	<b>Lead</b>	o	o	o	Lag*
<b>GB</b>	Lag*		Lag	<b>Lead*</b>	<b>Lead</b>
<b>GR</b>		<b>Lead</b>	Lag		<b>Lead</b>
<b>IE</b>	<b>Lead</b>	Lag	Lag	<b>Lead*</b>	Lag
<b>IT</b>		Lag		o	
<b>NL</b>	o*		Lag	o*	<b>Lead</b>
<b>PL</b>	Lag*	o	Lag	<b>Lead</b>	<b>Lead*</b>
<b>PT</b>	<b>Lead*</b>	o*			<b>Lead</b>
<b>SE</b>	<b>Lead</b>	Lag		Lag*	
<b>SI</b>	o*	o	o*	<b>Lead</b>	o*

Lead	<i>Net lending leads capacity utilization</i>
Lag	<i>Net lending lags capacity utilization</i>
o	<i>Covariance of net lending peaks at current levels of capacity utilization</i>
	<i>No clear, significant pattern observable</i>
	<i>Negative Covariance - Pro-cyclical net lending</i>
	<i>Positive Covariance - Counter-cyclical net lending</i>
*	<i>Unstable in one of three specifications of the robustness check</i>

Table 2: Net lending of the institutional sectors over the cycle.<sup>8</sup> Households net lending tends to lead, corporate net lending tends to lag the cycle.

In terms of signs, private sector net lending appears pro-cyclical and external sector net lending counter-cyclical in virtually all countries. Public sector net lending is consistently counter-cyclical. When significant and robust, household net lending tends to lead or co-move with the cycle, i.e. household net lending tends to decrease prior to an upswing and increase before a downturn.<sup>9</sup> These findings are consistent with results for the United States (Barbosa-Filho et al., 2006, 2008).

Non-financial corporations' net lending lags the business cycle in most countries, especially in the Northern group. In Germany, Denmark, Finland, and Sweden as well as in Italy, Ireland, and the Euro Area as a whole, the corporate sector increases its net borrowing only after the trough. In all of these countries, with the exception of Italy and the Euro Area (17), the corporate sector has

<sup>8</sup> Countries with limited data are omitted in the table (see footnote 3). For robustness, calculations are conducted for two additional measures of capacity utilization: the Butterworth high-pass and Christiano and Fitzgerald (2003) filters on real GDP.

<b>FR</b>	<ul style="list-style-type: none"> <li>• <b>RoW</b> is insignificant in the two alternative specifications</li> </ul>	<b>PL</b>	<ul style="list-style-type: none"> <li>• <b>RoW</b> shifts from Lead to o in one specification</li> <li>• <b>HH</b> shifts from Lag to o in one specification</li> </ul>
<b>GB</b>	<ul style="list-style-type: none"> <li>• <b>HH</b> shifts from Lag to o in one specification</li> <li>• <b>Gov</b> shifts from Lead to o in one specification</li> </ul>	<b>PT</b>	<ul style="list-style-type: none"> <li>• <b>HH</b> shifts from Lead to o in one specification</li> <li>• <b>Cor</b> shifts from o to Lag in one specification</li> </ul>
<b>IE</b>	<ul style="list-style-type: none"> <li>• <b>Gov</b> shifts from Lead to o in one specification</li> </ul>	<b>SE</b>	<ul style="list-style-type: none"> <li>• <b>Gov</b> shifts from Lag to o in one specification</li> </ul>
<b>NL</b>	<ul style="list-style-type: none"> <li>• <b>HH</b> is insignificant in the two alternative specifications</li> <li>• <b>Gov</b> shifts from o to Lag in one specification</li> </ul>	<b>SI</b>	<ul style="list-style-type: none"> <li>• <b>HH</b> shifts from o to Lead in one specification</li> <li>• <b>Fin</b> shifts from o to Lag in one specification</li> <li>• <b>RoW</b> shifts from Lead to o in one specification</li> </ul>

<sup>9</sup> Household net lending 'Granger causes' output movements statistically. In this sense, the cycle is HH net lending driven.

been in a net lending position for most of the observation period, with investments falling short of internal savings.

Government net lending is countercyclical in all countries and more strongly leads than lags the cycle in the Eastern economies of the sample i.e. Slovenia, Poland and the Czech Republic as well as in Spain and, Great Britain and Ireland. In all economies of the Northern group government net lending either lags the cycle (Germany, Sweden) or moves with it (Finland, Denmark, Netherlands).

Foreign net lending is positively associated with the cycle in all countries (except the Netherlands), suggesting internal demand as a determinant of the foreign balance. In Great Britain, Greece, Portugal, Poland and the Netherlands, foreign net lending more strongly leads than lags the cycle. It is most important in magnitude for Greece and Portugal, where it is the only significant countercyclical sector.

The financial corporate sector's net lending exhibits small covariances with both leads and lags of capacity utilization and is acyclical in that no clear cyclical pattern is observable or lagging the cycle in many countries.

#### **4 Ricardian equivalence, twin deficits, and demand**

The offsetting movements of net lending and net borrowing flows touch upon central predictions of prominent theories. In the following these, the *twin deficit hypothesis* and *Ricardian equivalence* in particular, will be evaluated empirically. Barro (1974) proposed *Ricardian equivalence*, the idea that (in a neoclassical setting with perfect capital markets, perfect information, rational expectations, etc.) consumers internalize the government's debt decisions in their consumption and saving behavior and that an increase in government net borrowing will therefore cause an increase in private net lending. As agents anticipate that they will have to pay higher taxes in the future, current saving increase in order to smooth consumption.<sup>10</sup>

In a Keynesian perspective, causality traditionally runs in the opposite direction: private net lending is the active part, 'causing' public deficits. In a situation where the private sector chooses to increase its net lending due to animal spirits or uncertainty, the government cannot directly control its own deficit; the government can keep up its expenditure and run a deficit due to the lower revenues or decrease its spending causing a further drop in aggregate demand and thus fiscal balance. This produces the same pattern as expected in *Ricardian equivalence*, but with reversed causality. In the view presented here, however, budget deficits emerge passively and, as Steindl puts it, have to be "[...] endured like wind and rain" (Steindl 1990, Chapter 15, p. 212).

The *twin deficit hypothesis* constitutes another prominent prediction for the structural relationship between particular net lending flows. It asserts that, under the assumption that all resources are fully employed and the domestic price level is tied to foreign prices by arbitrage in foreign trade, a

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<sup>10</sup> Consumption smoothing features in multiple theories of consumption: Duesenberry's (1949) ratchet effects, the life-cycle model of Modigliani and Brumberg (1954) and Friedman's (1957) permanent income hypothesis. The idea was also already present in Keynes' works (Keynes and Henderson, 2013) under the name 'diversion' and has been a central topic of discussion in economic policy making for a long time.

higher fiscal deficit will spill over into a larger external deficit through higher imports.<sup>11</sup> From a theoretical perspective the concept's shortcomings are manifold. While the underlying loanable funds framework is problematic, the hypothesis also overlooks the important role of distribution, the independent impact of monetary policy on investment via the interest rate and implies that a public deficit *per se* indicates excess consumption (Blecker, 1992). In consequence, the direction of causality when twin deficits occur has been heavily disputed. Summers (1988) argues that governments engage in 'current account targeting', adjusting their fiscal balance to movements in the external account, creating twin deficits.

	<b>Twin deficit hypothesis</b>	<b>Ricardian equivalence</b>	<b>Keynesian perspective</b>
<b>Government net lending</b>	<i>active</i>	<i>active</i>	<i>passive</i>
<b>Private net lending</b>		<i>passive</i>	<i>active</i>
<b>Foreign net lending</b>	<i>passive</i>		

**Table 3: Asserted causalities in prominent hypotheses.**

In the following we evaluate these relationships, summarized in table 3, using the adding-up constraint that the variance  $\gamma_{ii}$  of one sector's net lending must be equal to the negative sum of its covariances  $\gamma_{ij}$  with the other sector's net lending:<sup>12</sup>

$$\gamma_{ii} = - \sum_{i \neq j} \gamma_{ij}$$

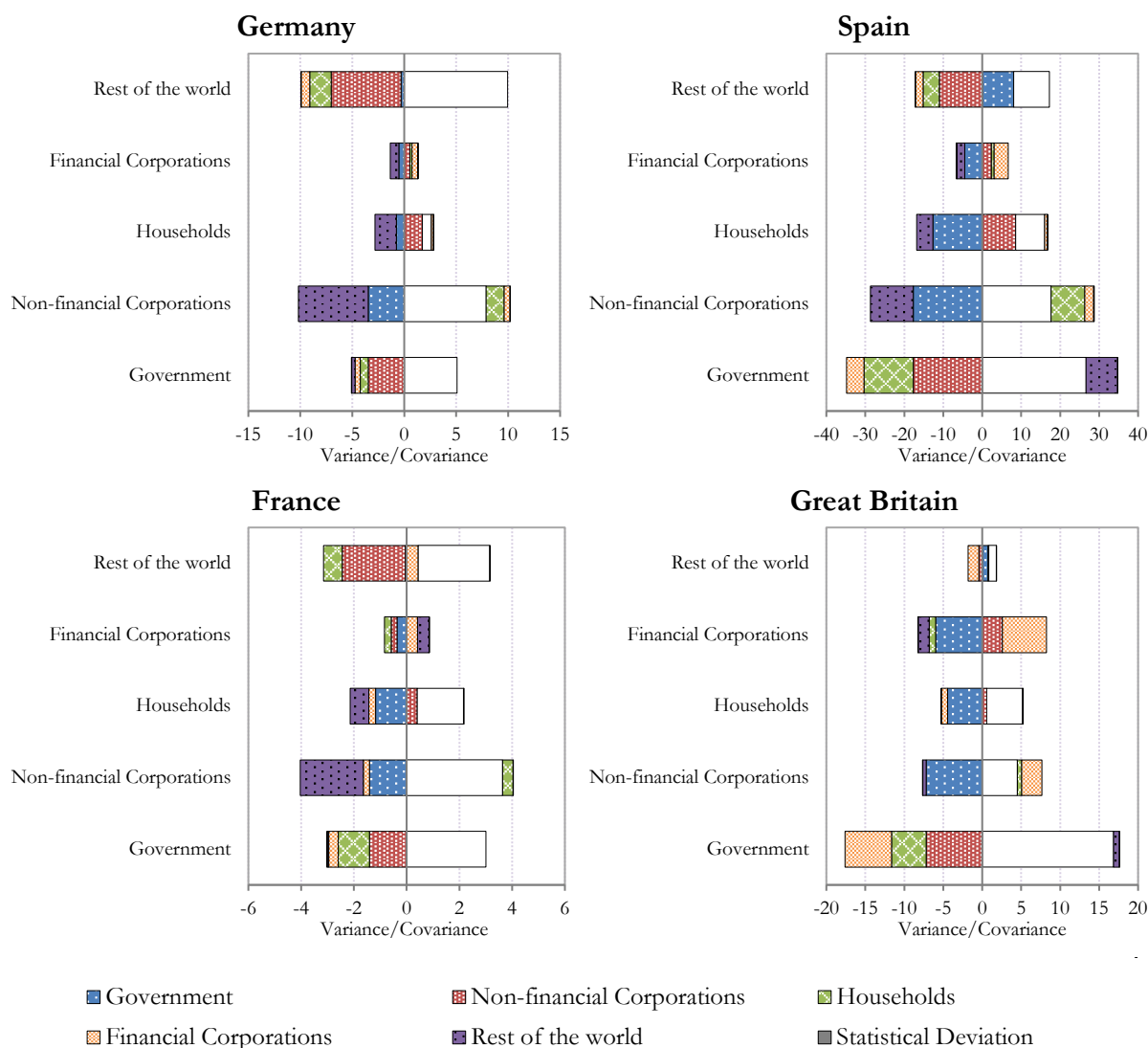
This implies that we can decompose a sector's net lending variance into the covariances of this sector's net lending with that of all other sectors and test the relations postulated by *Ricardian equivalence*, *twin deficit hypothesis* or a Keynesian perspective statistically.

Figure 3 shows this decomposition of each sector's net lending variance. Blank areas equal the sector's net lending variance and patterned areas represent the sector's net lending covariances with that of the remaining sectors. The decomposition of the variance in foreign net lending shows no sizable negative correlation between the external and public deficits. In Spain the substantial correlation is even positive. This leads us to reject the *twin deficit hypothesis* for these four countries. Public net lending is negatively correlated with private net lending in the four big economies. At first glance, this supports *Ricardian equivalence*. Both corporate and household net lending, however, are pro-cyclical with respect to capacity utilization. Given that smoothing of consumption would require a counter-cyclical dynamic, we conclude that *Ricardian equivalence* does not hold for Germany, Great Britain, France, and Spain over the observed period.<sup>13</sup>

<sup>11</sup> The concept was originally proposed by Polak (1957) and became the theoretical basis for the IMF Financial Programming which has been imposed on numerous (developing) countries. The hypothesis was at a hiatus during the Reagan era (Volcker, 1984) and is still frequently cited, especially for the United States.

<sup>12</sup> The algebraic and statistical apparatus follows Barbosa-Filho et al. (2008) and is further discussed in the appendix.

<sup>13</sup> While overall expenditure is not smoothed, the data does suggest that households smooth their consumption via disposable income and not via reductions or increases in savings. Similarly results have been found for the United States (Barbosa-Filho et al., 2008).



**Figure 3: Decomposed variance of sectoral net lending flows. Blank areas show the variance, patterned areas the covariances with net lending of other sectors.**

Table 4 reports similar decompositions for the remaining sample. Public net lending highly correlates with private net lending in most countries (with the exceptions of Austria, Belgium, Finland, and Hungary). The variances of business and household net lending is explained mostly by the government sector and the rest of the world. The variance of financial corporations' net lending is negligible many countries. The covariance between the private sectors, especially households and non-financial corporations is positive, while the covariance with the financial corporations alternates in sign between countries.

	Contribution of private net lending	of which			Contribution of foreign net lending
		HH	NFC	FC	
<b>AT</b>	0.45	-0.35	1.18	-0.38	<b>0.55</b>
<b>BE</b>	0.21	0.07	0.51	-0.37	<b>0.79</b>
<b>CZ</b>	<b>0.95</b>	0.22	0.27	0.45	0.05
<b>DE</b>	<b>0.93</b>	0.15	0.68	0.10	0.06
<b>DK</b>	<b>1.31</b>	0.56	0.62	0.12	-0.31
<b>EA</b>	<b>1.11</b>	0.24	0.66	0.21	-0.11
<b>EE</b>	<b>2.18</b>	0.77	1.11	0.30	-1.18
<b>ES</b>	<b>1.30</b>	0.47	0.66	0.17	-0.30
<b>FI</b>	0.26	0.20	0.04	0.02	<b>0.69</b>
<b>FR</b>	<b>0.98</b>	0.39	0.47	0.12	0.02
<b>GB</b>	<b>1.05</b>	0.26	0.43	0.36	-0.04
<b>GR</b>	<b>1.12</b>	0.12	0.34	0.66	-0.12
<b>HU</b>	0.24	0.36	-0.16	0.04	<b>0.76</b>
<b>IE</b>	<b>1.15</b>	0.42	0.17	0.57	-0.08
<b>IT</b>	<b>0.75</b>	0.08	0.53	0.13	0.27
<b>LT</b>	<b>2.35</b>	0.67	1.47	0.20	-1.35
<b>NL</b>	<b>0.59</b>	0.23	0.22	0.14	0.41
<b>PL</b>	<b>1.41</b>	0.13	1.47	-0.18	-0.40
<b>PT</b>	<b>0.92</b>	0.37	0.15	0.41	0.10
<b>SE</b>	<b>0.95</b>	0.43	0.38	0.15	0.07
<b>SI</b>	<b>1.71</b>	0.10	1.28	0.34	-0.72
<b>SK</b>	<b>1.05</b>	0.09	0.92	0.04	-0.05

Table 4: Contributions to the variance of government net lending. The foreign-public connection asserted by the *twin deficit hypothesis* is scantily present in the data. The observable private-public relationship seems to support *Ricardian equivalence*.

As suggested above, these patterns superficially coincide with the predictions of *Ricardian equivalence*. Nonetheless, as shown in the previous chapter, the pro-cyclical net lending and net borrowing behavior of households contradicts the consumption smoothing hypothesis at the core of *Ricardian equivalence*. For the *twin deficit hypothesis* to be considered as a possible explanation, covariances between government net lending and foreign net lending need to be negative, as the notion suggests that public net borrowing causes foreign net lending, and substantial in magnitude in comparison to the other covariances of foreign net lending. For all countries (with the exception of Finland and Belgium) the foreign-private as well as the public-private relationships play a greater role than the foreign-public connection.<sup>14</sup>

## 5 Conclusion and implications for economic policy

Revisions in the national accounts introduced with the European System of Accounts 1995 introduce a sectoral decomposition of the financial and non-financial accounts. This allows us to conduct an analysis of the net lending and net borrowing flows of these institutional sectors in Europe since the introduction of the Euro in 1999, describing sectoral trends leading up to and since the crisis.

<sup>14</sup> Half of the countries display positive covariances between the government's and the rest of the world's net lending. Within those countries with a negative covariance it is predominantly significantly smaller than the covariance between the government sector and the private sectors. Also in Finland and Belgium the *twin deficit hypothesis* is at least not the only mechanism at work as the private sector is not neutral in terms of covariance as predicted by the hypothesis.

Before the crisis European economies differed substantially in their sectoral net lending pattern, or macroeconomic structural configuration. In the Northern group (AT, BE, DE, DK, FI, NL, SE) many countries experienced low public deficits or even budget surpluses, current account surpluses, and the private sector was in a net lending position. In the Southern periphery (ES, GR, PT), the Anglo-Saxon (IE, GB), and Eastern European countries (CZ, EE, HU, LT, PL, SI, SK), many governments ran public deficits and the private sectors were net borrowing, which mirrored in foreign net lending, i.e. current account deficits. France and Italy were most balanced with an average public deficit around 3 percent of GDP before the crisis, small current account deficits and the private sector being a net lender to the economy.

The Great Recession had similar effects on sectoral net lending behavior in all countries. Consistent with Koo's notion of a *balance sheet recession*, the private sector moved to a or increased its net lending position, thereby weakening aggregate demand. Public net borrowing increased as a consequence. Foreign imbalances reduced and the extrema of external balances converged, mostly through adjustment in the deficit countries. Other imbalances, however, remain.

In line with the above observations, a statistical investigation of the cyclical behavior of the sectors' net lending reveals that the households and business behave pro-cyclically, while the government exhibits a counter-cyclical behavior and the current account tends to deteriorate during upswings. Moreover, a statistical lead/lag analysis reveals that household net lending tends to lead the business cycle in many countries while especially in the Northern group the non-financial corporate sector tends to lag the cycle. This finding suggests that policies aimed influencing household behavior are more likely to contribute to a recovery than supply-side measures aiming at stimulating corporate investment.

Finally, variance decomposition suggests that the *twin deficit hypothesis* is not suited to explain sectoral net lending trends for European countries since the introduction of the Euro. *Ricardian equivalence*, which latently features into current prescriptions of austerity and increasing 'competitiveness', is also not supported by the empirical facts. A Keynesian perspective of passive public and active private sectors seems to better explain the observed correlations. In our analysis we did not consider the possibility of the substitution between different sources of final demand (e.g. a *crowding out* of private investment by public activity) which could produce patterns consistent with the data.

In light of these findings, stimulating domestic demand -- especially in the Northern group -- seems to be a viable alternative to the one-sided austerity policies imposed especially on the Southern periphery. Such an expansionary strategy would increase welfare in both country groups, while also increasing import demand and thereby supporting the periphery countries' recovery process. External pressures with Non-EU economies could be compensated via devaluation. Moreover, the expansionary effect would produce the necessary leeway for governments to consolidate without the risk of stifling the weak recovery. The following measures have the potential to increase demand in the surplus countries and differ in their effectiveness and likeliness of implementation (see also Glötzl et al. 2014):

- (i) **A credit-financed expansion of the investment activity by non-financial corporations.**

Non-financial corporations are making substantial financing surpluses. In some countries corporations even seek to deleverage to an extent where their credit transactions are negative, thus reducing the absolute amount of debt, in line with Koo's balance sheet recession. Due to mechanisms of the *paradox of thrift* their overall leverage however remains high. In light of the low level of capacity utilization and a situation of liquidity trap with interest rates close to zero in combination with the fact that the non-financial corporations' net borrowing tends to lag the cycle rather than lead it, prospects for this avenue are poor. Recent efforts of the ECB to lower corporate financing costs are directed at spurring investment demand but their effectiveness remains to be seen.

**(ii) Increased government investment.**

Government investment and discretionary spending has the potential to put a floor under the negative dynamic of faltering aggregate demand. Fiscal multipliers increase in downturns and prove especially effective in cash-constrained economies. Quantitative easing lowered the cost of public funds to close to zero or even negative, creating much needed fiscal space for debt-financed, long-term government investment. Nonetheless, high public debt levels and national as well as the EU regulations (such as the European Fiscal Compact) strongly limit the expansionary possibilities. This suggests that expansionary policy should be undertaken in the (Northern) surplus countries, where the fiscal space to do so is wider.

**(iii) Redistribution to boost demand.**

The evidence on wage-led demand in Europe (e.g. Stockhammer et al., 2008; Lavoie and Stockhammer, 2013) suggests that a redistribution of income toward wages boosts aggregate demand. Even if demand was profit-led, as argued by other studies, the adverse effects of redistributive policy on external competitiveness could be compensated by changes in the exchange rate. Such policies could involve the introduction of or increases in the minimum wage or a reduction of working time. A change in the personal income distribution, or the compression of the distribution of income within wages, would have similar effects as redistribution of functional income (Carvalho and Rezai, 2016). This in turn would brighten business expectations and revive private investment. Such an approach seems especially promising, as households tend to lead the business cycle.

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