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Sectoral Net Lending in Six Financial Centers

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Abstract

This paper documents the evolution of net flows of saving across sectors in six financial centers: the United States (1947-2011), the United Kingdom (1991-2010), France (1971-2011), the Netherlands (1980-2011), Germany (1995-2011), and Switzerland (1995-2011). The paper has two main goals. First, we document the evolution of the allocation of funds between financial instruments and capital accumulation at the level of aggregate sectors during the recent decades. Second, we assess whether the recent expansion of finance, propelled by financial innovation and deregulation, has corresponded to a greater need for external funds to finance the accumulation of private, non-residential capital.

We find that non-financial corporations have reduced their reliance on external finance for capital expenditures in the United States after 1980 and in the European countries in the 2000s — to the point that non-financial corporations became net lenders in the United Kingdom, Germany, and Switzerland during that period. The lower use of funds by non-financial corporations was, in almost all cases, associated with lower demand for productive investment as a share of GDP. In turn, household net lending collapsed in the United States in 1980-2007, and in the United Kingdom and the Netherlands in the 2000s. Despite lower demand for external funds from non-financial corporations as a share of GDP, financial corporations expanded net lending in almost all these countries, a change chiefly associated with higher retained earnings.

Our findings suggest deep changes in the financial behavior of aggregate sectors in recent decades, complementing recent analyses that call into question the social benefits of large and complex financial systems (e.g.: Crotty, 2009; Panizza et al., 2012; Crotty and Epstein, 2013), as well as recent analyses of the 'financialization' of non-financial firms (e.g.: Lazonick and O'Sullivan, 2000; Stockhammer, 2004; Orhangazi, 2008; Davis, 2013).

Keywords: sectoral net lending, investment, financialization.

JEL Classification Codes: G01, G21, G23, E22, E44.

1 Introduction

Many authors have underscored the recent rise of finance across developed economies, often following in the wake of financial liberalization. This rise is expressed in several measures of economic activity, such as a growing share of financial corporations in aggregate value added, profits, and wage income (Crotty and Epstein, 2013; Philippon and Reshef, 2013), in a growing share of financial revenues in total revenues of non-financial corporations (Krippner, 2005), and in the

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influence of shareholder norms in the portfolio decisions of non-financial corporations (Lazonick and O'Sullivan, 2000; Stockhammer, 2004; Orhangazi, 2008, 2011; Davis, 2013).

But does the social need for the classic functions of finance justify this recent growth in the value of financial instruments and in the incomes derived from financial activities? In this paper, we examine recent changes in how the main domestic aggregate sectors — non-financial corporations, households, financial corporations, and the government — allocate funds between capital investment and financial instruments. We show that the rise of finance in recent decades has correlated with deep changes in the financial behavior of these sectors.

To do so, we document intersectoral flows of saving in six of the world's largest financial centers: the United States (1947-2011), the United Kingdom (1990-2011), Germany (1995-2011), the Netherlands (1980-2011), Switzerland (1995-2011), and France (1971-2011). These countries include the top-ranked U.S. and European cities of the 2012 International Financial Center Development Index (Xinhua-Dow Jones, 2012). We focus on these countries because they boast some of the world's largest financial sectors, and these were at the forefront of the wave of financial innovation and institutional change that was key in precipitating the financial crisis of 2007-2008 and in transmitting its effects.

Our main findings can be summarized in three claims. First, non-financial corporations have financed a declining share of their capital investment with external funds since the 1980s in the United States, and since the early 2000s in the European countries. The change in the latter was particularly dramatic: at the eve of the 2008 global financial crisis, non-financial corporations had become net providers of funds to other sectors in Germany, the United Kingdom, and Switzerland — a reversal relative to the standard pattern of intersectoral financing.

In all countries, the reduction in the use of external finance (or the increase in net lending) by non-financial corporations was associated with a decline in capital investment as a share of GDP. But retained earnings either increased or remained stable, so that the decline in capital expenditures suggests a desire by non-financial firms to change the composition of their balance sheets towards a higher proportion of (net) financial assets. This change in financial behavior predates the abrupt move towards de-leveraging among non-financial corporations that characterized the crisis years after 2008.

Second, in a span of twenty years since 1980 households ceased to be the largest net lenders in the United States. In the late 1990s, they became net borrowers for the first time since the initial post-war years; this situation lasted until the onset of financial crisis in 2008. Similar, but sharper reversals occurred during 1991-2007 in the United Kingdom and the Netherlands. In all these cases, a decline in saving as a share of GDP explains the reversal, although capital expenditures — mostly resulting from residential investment — rose in the years leading up to the crisis as well.

But household behavior was heterogeneous across the countries in the sample: net lending did not decline significantly in France and Switzerland in the 2000s, while it increased in Germany.

Third, after a secular decline in 1950-1980, net lending by financial firms as a share of GDP recovered strongly in the United States in the 2000s. Until then, despite rising retained profits, net lending was kept low due to rising capital expenditures. After 2000, these expenditures initiated a moderate decline (as a share of GDP) while financial profits skyrocketed. As a result, financial firms again became net lenders to the rest of the economy — in fact, they were the only domestic net lenders in the years before the 2008 crisis. Importantly, the rising profits of the so-called "shadow banking" system (mutual funds, issuers of asset-backed securities, security brokers, etc.) account for the bulk of the recent expansion in net lending by the financial sector. Financial firms behaved similarly in the United Kingdom, Germany, and the Netherlands, where they vigorously expanded net lending to other sectors, as retained earnings in finance soared.

In sum, the recent decades of financial deregulation saw important changes in the net acquisition of financial instruments by all sectors — financial and non-financial alike. Among non-financial

corporations, a decline in net borrowing (or even positive net lending) went hand in hand with a decline in capital expenditures as a share of GDP. This pattern is consistent with narratives about the financialization of non-financial firms (Lazonick and O'Sullivan, 2000; Stockhammer, 2004; Orhangazi, 2008, 2011; Davis, 2013). Where lower use of funds by non-financial corporations coincided with the emergence of households as net borrowers, the resulting flows of funds across sectors were of questionable sustainability. This coincidence calls into question, from the perspective of aggregate sectors, the role commonly ascribed to financial innovation and deregulation in managing systemic risk and ensuring effective financial intermediation.

2 Motivation and Relation to the Literature

With the onset of the 2008 global crisis, research on assessing the role of finance in the economy has intensified. More specifically, the combination of a large increase in the size of finance and the outbreak of a massive financial crisis in the wealthy countries has raised questions about the social benefits associated with such a large and complex financial system. This question has led economists to seek measures of productive and unproductive financial activities and their consequences. This work has since produced insights from different yet complementary vantage points.

A strand of the literature has documented the rise of the stock of debt of non-financial sectors, pointing out its potentially detrimental effects. Using a sample of OECD countries, Panizza et al. (2012) and Cecchetti and Kharroubi (2012) show that standard measures of financial development have a non-linear effect on GDP and labor productivity growth. Beyond a threshold, estimated at around 110% of GDP, increases in the stock of private financial claims on private non-financial units hurts both GDP and labor productivity growth. They show that important OECD countries are currently past that threshold. In turn, Sturn and Epstein (2013) present evidence that much of the previously identified positive impact of finance on economic growth might be simply an artifact of the pro-cyclical growth of finance itself.

Schularick and Taylor (2012) provide further evidence of the secular rise in the stock of credit extended to non-financial units by assembling a rich historical dataset of several OECD economies. Instead of examining the effects of this trend increase, however, they chose to examine the effects of episodes during which credit expansion accelerates. The authors show that these credit 'booms' are significant predictors of the occurrence of financial crises.

Another strand of the literature point out that unproductive financial activities may also include excessive lending by financial firms to other financial firms. According to these authors, intra-financial lending is not simply an intermediate activity that serves the classic functions of finance. Rather, they point out that financial firms often use it to support proprietary trading, as opposed to providing intermediation and other services to non-financial units. Crotty and Epstein (2013) provide evidence of the rise of trading revenues in five large investment banks in the United States, while Bezemer (2012) and Montecino et al. (2014) document the rise in intra-financial sector lending in the United States. In turn, using vector autoregressions Montecino and Epstein (2014) find that intra-financial lending is often negatively related to gross capital formation in the non-financial sector, providing evidence that credit missallocation explains this negative relationship.

These two strands of the literature attempt to examine the effects of the size of financial activities by focusing on the evolution of sectoral balance sheets. In this paper, we take a different perspective and focus on two complementary questions. First, we assess the degree to which the flows of saving that underlie transactions in financial assets have corresponded to the need for external finance by sectors that account for the bulk of productive capital accumulation (such as non-financial corporations). Second, we assess the degree to which these flows have responded to

changes in the financial behavior of sectors such as households which, while accounting for a small share of non-residential capital accumulation, have typically provided net saving to other sectors.

Our findings resonate with previous analyses. For example, Galizia and Steinberger (2001) and Galizia (2003) show that the financing gap of non-financial corporations — i.e. the proportion of capital expenditures that are not funded by retained earnings — declined between 1970-1979 and 1990-1999 in France, Germany, Italy, and Spain. Our paper complements their findings by looking at other countries and at the recent period, as well as by relating the behavior of non-financial corporations to the behavior of other aggregate sectors.

Using data for the United States since 1947, Barbosa-Filho et al. (2008) show that net borrowing by non-financial businesses is often pro-cyclical, implying that the use of external finance tends to rise when aggregate demand and capital investment are buoyant. We find further support to this view among our sample of European countries; but we also discern a trend decline in the use of external finance in the countries of our sample that cuts across business cycles.

In turn, Davis (2013) provides firm-level evidence that the rise in shareholder value norms among large non-financial corporations in the United States — in part manifested by an increasing share of financial assets in their portfolios — has led to lower capital investment. Our findings, though obtained at a higher level of aggregation, are consistent with this narrative.

Finally, by combining several measures of the output and cost of financial services, Philippon (2012) suggests that the unit cost of intermediation has increased in the United States over the past 30 years. In turn, Crotty and Epstein (2013) show that the growth in the income received by the factors employed in the financial sector (as measured by value added) has exceeded the growth in the financing gap of the domestic non-financial sector since 1950 in the United States. When seen in light of these findings, the changes in the pattern of intersectoral financial flows documented in our paper provides another platform from which to raise the question of whether the recent expansion of finance is socially justified.

3 Methodology

The system of national accounts (SNA) provides the basic framework for computing intersectoral flows of saving (see United Nations, 1993, 2009). The SNA organizes the activities of an economy's institutional units into a logical sequence whereby income flows are generated, distributed, and used for consumption or wealth accumulation. The corresponding monetary flows are consolidated into interconnected accounts which reproduce this logical sequence.

The first set of accounts are current accounts; they record the generation, distribution, and use of income. The income receipts of different units are attributed to their participation in productive activities (either as workers or as owners of productive assets), to their ownership of financial assets and natural resources, and to the redistribution effected by taxation and other mandatory contributions, such as social security. The balancing item of these income receipt and redistribution accounts is the gross disposable income of each sector.

Gross disposable income is then partly used by households and the general government for final consumption; the difference between disposable income and final consumption is **gross saving**. Since the SNA does not attribute final consumption to business firms and to the rest of the world, their gross saving is identical to their gross disposable income. In the case of domestic business firms, the main sources of gross saving are retained profits from productive activities and net property income (such as interest earned on financial assets minus interest paid on financial liabilities).

Gross saving is a resource for the accumulation of wealth, and hence it is carried forward to the next set of accounts: the accumulation accounts. They record how saving (augmented by

net capital transfers) is spent on the acquisition of non-financial assets. For example, the capital account shows the extent to which business firms finance the acquisition of fixed capital and intangible productive assets with retained earnings and net investment subsidies.

The balancing item of the capital account is **net lending or borrowing** by the sector in question. If a sector's capital expenditures exceed saving and net capital transfers, then that sector must necessarily finance the difference by borrowing from other domestic sectors or from foreign residents[1].

The counterpart to the capital account is the **financial transactions account**. If a sector is a net borrower, the change in its total liabilities must exceed the change in its total assets. By definition, the balances of the capital and the financial transactions accounts should be the same. Since different sources provide data for the construction of these accounts, however, there is often statistical discrepancy between the two, which at times can be substantial.

In this paper, we only use net lending as derived from the capital account (as opposed to the financial transactions account) as a measure of intersectoral saving flows. We do this to focus on the relation between net lending and decisions regarding the magnitude of capital expenditures and the way in which they are financed. Table 1 summarizes the structure of the capital account and presents the definition of our measure of net lending.

The relevant data series for the United States were obtained from the Flow of Funds database, covering the 1947-2011 period. The corresponding series for the European countries were obtained from the Eurostat ESA95 database, covering the 1971-2011 period for France, the 1980-2011 period for the Netherlands, the 1990-2011 period for the United Kingdom, and the 1995-2011 period for Germany and Switzerland. Tables A.1 and A.2 in the Appendix describe the data series used in the construction of each measure.

Table 1: The Capital Account, General Format: Summary by Sources and Uses

Sources	**Uses**
Gross Saving	Gross Capital Formation
Net Capital Transfers Received	Net Purchases of land and intangible assets
	Net Lending (+) or Net Borrowing (-)

3.1 Dating Procedure

To ease interpretation, we have divided the sample for each country into periods during which sectoral net lending exhibited a particular pattern. But instead of choosing common periods for all countries and sectors, we used a statistical testing procedure to endogenously determine where changes in sectoral net lending were greatest.

Our default procedure was to test for changes in the mean of the series of net lending for each sector and country. But in some specific cases, visual inspection of the series suggested the presence of trends (and trend reversals), particularly with net lending by the household sector. In those cases, we also tested for changes in a fitted linear trend.

We identified these structural breaks using the Bai-Perron procedure (Bai and Perron, 1998, 2002). Its main advantage with respect to standard structural break tests the use of a data-driven

[1]The sum of the balance of the capital or financial transactions accounts over all the domestic sectors (non-financial corporations, financial corporations, households and non-profits, and the general government) is by definition equal to the negative of the balance of the "rest of the world" sector.

algorithm to determine the existence, number, and location of structural breaks in the parameters describing the series, without requiring the researcher to hypothesize about the dates in which a break is likely to have occurred. The procedure begins with a choice (made by the researcher) of the the minimum length of each segment, and hence of the maximum number of breaks that can be identified. We chose a minimum segment length of 4 years, which could allow the identification of a break in the crisis year of 2007. We also experimented with a minimum length of 5 years and with the series truncated in 2007; the results did not vary significantly between these two approaches.

Given the maximum number of segments that can be identified, we used the procedure to select the number and the location of the breakpoints by optimizing goodness-of-fit criteria. Since goodness-of-fit naturally increases with the number of identified breaks, we also adopted a penalty to prevent excessive segmentation when choosing the optimal number of breaks. This was achieved with the use of the Bayesian Information Criterion (BIC). Section A.2 in the Appendix provides further details about the testing procedure.

It must be noted that, in essence, the dating procedure that we implemented seeks to maximize goodness of fit while avoiding excessive segmentation. It does not attempt to formally test the statistical significance of the breaks against well-defined null hypotheses of parameter stability. Since we use this procedure with the sole goal of aiding our descriptive analysis — i.e. to identify periods of a certain minimum length during which average sectoral net lending (or its trend) appears to have changed —, we do not believe that this shortcoming is important.

4 Non-Financial Corporations

Non-financial corporations undertake the bulk of private nonresidential fixed investment in a capitalist economy, and in most countries the sector has historically relied on external funds to finance part of its capital investment. The transfer of net saving from other sectors to fund fixed investment by non-financial corporations has therefore been an important function of financial intermediation.

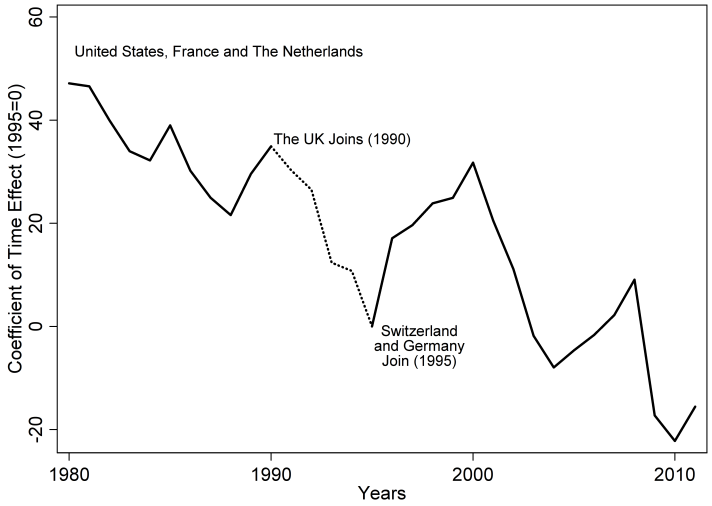
We thus begin by examining the evolution of the share of total capital expenditures by non-financial corporations that has been externally financed in the countries under study. We do so by computing a ratio of net borrowing (the negative of net lending) to total capital expenditures for non-financial corporations. A positive ratio indicates that a portion of total capital expenditures was externally financed; or, equivalently, that the sector was a net borrower in the period. The value of the ratio indicates the share of capital expenditures that was financed by borrowing. In turn, a negative ratio indicates that internal funds exceeded capital expenditures. In this case, the sector was a net lender, accumulating more financial assets than financial liabilities.

Figure 1 below shows the general trend in the use of external finance by non-financial corporations since 1980 in our sample. It plots the coefficients of year dummies in a panel regression controlling for fixed effects. There may be institutional reasons for the average use of external finance to vary across countries. By controlling for these time-constant idiosyncratic factors, the plot shows the evolution of the average use of external finance that is ascribed to common, time-varying factors. The chosen baseline year was 1995, so that the coefficients can be interpreted as the change with respect to the difference between a country's actual net borrowing ratio in 1995 and its country-specific mean.

As we can see, the figure suggests a declining trend in the use of external finance by non-financial corporations since 1980. Two notable exceptions are the second half of the 1990s, during which non-financial corporations in most countries in our sample made greater use of external funds — presumably to finance an acceleration of investment — and, to a smaller extent, the years leading up to the global financial crisis of 2008. The greater use of external finance during

these cyclical expansions corroborates the findings of Barbosa-Filho at el (2008) for the United States. Still, an important observation is that these periods were short-lived, and at their peaks the common trend in the use of external finance was still lower than at the start of the 1980s.

Figure 1: Non-financial Corporations: Common Trend in the Use of External Finance



Notes: The figure plots the β_2 coefficients of the fixed-effects regression ${}^{\text{nb}}/_{\text{capx}} = \beta_0 + \beta_1 a_i + \beta_2 a_t + \epsilon_{i,t}$, where i indexes countries, t indexes years, a denotes dummy variables, and ${}^{\text{nb}}/_{\text{capx}}$ denotes the ratio of net borrowing to capital expenditures by non-financial corporations. The chosen baseline year is 1995. The data sources, as noted in the text, are the US Flow of Funds database and Eurostat's ESA95 database. The panel is unbalanced, with the 1980-1989 period including only the United States, France, and the Netherlands. The United Kingdom joins the sample in 1990, while Germany and Switzerland join in 1995.

In Tables 2 and 3 below, we look at how the use of external finance evolved in each country, and suggest a correlation between fluctuations in the use of external finance and fluctuations in capital expenditures.

The first column of Table 2 shows the average ratio of net borrowing by non-financial corporations over their total capital expenditures for different sub-periods. As described in section 3.1, we identified the relevant sub-periods for each country using the Bai-Perron procedure to locate structural breaks in the mean of this ratio. For the same sub-periods, the second column of the table shows the average capital expenditures of non-financial corporations as a share of GDP.

In turn, Table 3 shows a decomposition of the changes in average net lending (the negative of net borrowing) as a share of GDP into the contributions of gross saving (plus net capital transfers received) and capital expenditures. This decomposition follows from the definition of net lending described in section 3 above. Since no consumption is assigned to the corporate sector, changes in retained earnings (from both productive operations and net property income) are responsible for the observed changes in saving. In turn, most of the changes in capital expenditure are driven by changes in gross fixed capital formation, which comprise the bulk of the capital expenditures of the corporate sector.

4.1 United States

With the exception of brief periods, non-financial businesses were net borrowers during most of the 1947-2007 period. This period can be divided into three parts with the aid of the estimated breakpoints. As shown in Table 2, average net borrowing was 9.1% during 1947-1965, indicating that in net terms less than ten percent of total capital expenditures were externally financed.

Starting in the mid sixties, however, the net demand for external funds rose substantially. A break was identified in 1965, and average net borrowing rose to 21.2% of total capital expenditures in 1966-1981. This rise in the use of external finance is correlated with the evolution of capital expenditures by non-financial corporations as a share of GDP. As shown in the second column of Table 2, the increase in the use of external finance in 1966-1981 corresponds to an increase in capital expenditures of almost 2% of GDP.

Indeed, the decomposition of net lending in Table 3 shows that the rise in external financing as a share of GDP in 1966-1981 owes itself almost entirely to this increase in capital expenditures. By contrast, average gross saving remained fairly stable as a share of GDP between the two periods.

In the early 1980s, the share of capital expenditures by non-financial corporations in GDP initiated a steep decline that lasted through the recession of the early 1990s. The 1980s also inaugurated a period of wide fluctuations in this measure: the downturn of 1981-1991 was followed by a recovery in 1991-2001, by another downturn in 2001-2004 (triggered by the dotcom bust), and by a short-lived recovery interrupted by the 2008 crisis.

Still, average capital expenditures in 1982-2007 remained almost 1.6% of GDP below their value in 1966-1981, and the use of external finance by non-financial corporations followed suit. The share of externally-financed capital expenditures hovered around 6.9% in 1982-2007, with substantial volatility. Finally, the 2008 crisis prompted a reversal of the net saving flows of non-financial firms without precedent in the post-war period. As a result of lower investment and of a desire by firms to restructure their balance sheets, the sector became a net lender of funds.

Table 3 shows that the reduction in borrowing in 1981-2007 was again associated with a fall in capital expenditures, with the variation in saving being modest.

In sum, the period between the late 1940s and 1981 in the United States is characterized by growing investment demand and a growing reliance on external finance by non-financial corporations. By contrast, the 1982-2007 period is characterized by falling investment demand as a share of GDP and by an increase in its volatility. Since gross corporate saving as a share of GDP remained relatively stable between these periods, the 1982-2007 period is also characterized by lower average reliance on external finance.

4.2 United Kingdom

From 1990 until 2002, British non-financial corporations relied considerably less on external finance than their American counterparts: on average less than 1% of the sector's capital expenditures were externally financed. Our testing procedure identified a structural break in 2002: from that year onwards non-financial corporations were on average net lenders to the rest of the economy. Table 3 indeed shows that average net lending rose by over 3% of GDP between the two periods, turning the sector into the main domestic provider of net saving in the United Kingdom in 2002-2011 (see section 8 below).

Like in the United States, this downward shift in the use of external finance was correlated with a decline in average capital expenditures of almost 2% of GDP between the two periods.

Table 3 shows that the sharp reversal in the sector's net flow of saving is explained in nearly equal measures by an increase in gross saving and a fall in capital expenditures as a share of GDP. On aggregate, British non-financial corporations had more retained earnings at their disposal, but they chose to use these funds to acquire net financial claims on other sectors at the expense of productive capital accumulation. Note that this behavior — which has been proposed as an explanation for the balance-sheet slump affecting many economies since 2008 — predates the 2008 global crisis by 5 years in the case of the United Kingdom (see Table 3).

Table 2: Non-Financial Corporations: Use of External Finance

	Period	Net Borrowing (% of capital expenditures)	Capital Expenditures (% of GDP)
United States	1947-**1965**	9.1	10.0
	1966-**1981**	21.2	11.9
	1982-**2007**	6.9	10.3
	2008-2011	-25.9	8.3
United Kingdom	1990-**2002**	0.6	10.9
	2003-2011	-37.4	9.1
Germany	1995-2001	11.7	11.5
	2002-2011	-9.3	10.2
The Netherlands	1980-**1993**	-8.7	11.6
	1994-**2001**	-31.4	10.8
	2002-2011	-86.7	8.8
Switzerland	1995-**2002**	4.3	13.1
	2003-2011	-25.6	12.6
France	1971-**1975**	41.8	10.4
	1976-**1985**	52.9	9.3
	1986-**1991**	19.4	9.9
	1992-**1999**	-0.9	8.4
	2000-2011	15.1	9.9

Note: The years in boldface indicate the breaks in the mean of the ratio of net borrowing to capital expenditures, as identified by the Bai-Perron procedure (see the Appendix for more details). No breaks were identified for Germany according to the procedure's criteria for maximizing goodness of fit. For ease of exposition, we chose the second-best segmentation, yielding a break in 2001 (not in boldface).

4.3 Germany, Switzerland, and the Netherlands

Germany and Switzerland share with the United Kingdom the fact that non-financial corporations became net lenders in the early 2000s and remained so through the crisis years. Our testing procedure found a break in the Swiss series of use of external finance that coincided with that in the United Kingdom (2002). Average net borrowing as a share of capital expenditures went from 4.3% in 1995-2002 to over -25% thereafter. Germany saw a similar reversal after 2001.

This reversal was accompanied by a decline in capital expenditures as a share of GDP in both countries — a modest decline in Switzerland and a pronounced decline in Germany. Table 3 indeed shows that most of the reversal in Switzerland resulted from a large rise in corporate saving concentrated in 2003-2007. By contrast, German firms accumulated net financial claims primarily through a reduction in capital expenditures as a share of GDP, which was also concentrated in the years before the 2008 crisis.

The Netherlands saw a similar rise in net lending by non-financial corporations in the early 2000s — identified to have occurred in 2001. The decomposition in Table 3 shows that a sharp rise in gross saving and a sharp fall in capital expenditures as a share of GDP explain the rise in net lending after 2001 in equal measures. It is worth noting that, as in Germany and Switzerland, the bulk these changes occurred before the 2008 crisis.

Dutch firms had already displayed a similar, though less extreme increase in average net lending in 1994-2001 compared with 1980-1993 (this time owing more to a rise in saving than a fall in capital accumulation).

Table 3: Non-Financial Corporations: Decomposition of Changes in Net Lending

			Change between Periods 1 and 2 (% of GDP)		
	Period 1	**Period 2**	Net Lending	Gross Saving (plus net capital transfers received)	Capital Expenditures
United States	1947-**1965**	1966-**1981**	-1.55	0.31	1.86
	1966-**1981**	1982-**2007**	1.8	0.21	-1.59
	1982-**2007**	2008-2011	2.76	0.76	-2
United Kingdom	1990-**2002**	2003-2007	3.25	1.87	-1.38
	2003-2007	2008-2011	0.56	-0.26	-0.83
Netherlands	1980-**1993**	1994-**2001**	2.15	1.52	-0.63
	1994-**2001**	2002-2007	3.92	1.95	-1.97
	2002-2007	2008-2011	0.91	0.6	-0.3
Germany	1995-2001	2002-2007	2.15	0.89	-1.25
	2002-2007	2008-2011	0.74	0.43	-0.31
Switzerland	1995-**2002**	2003-2007	4.04	3.69	-0.34
	2003-2007	2008-2010	-0.77	-1.16	-0.39
France	1971-**1975**	1976-**1985**	-0.53	-1.26	-1.28
	1976-**1985**	1986-**1991**	2.99	3.78	0.55
	1986-**1991**	1992-**1999**	1.99	0.50	-1.49
	1992-**1999**	2000-2007	-1.36	0.13	1.49
	2000-2007	2008-2011	-0.68	-0.63	0.05

Note: The years in boldface indicate the breaks in the mean of the ratio of net borrowing to capital expenditures, as identified by the Bai-Perron procedure (see the Appendix for more details). No breaks were identified for Germany according to the procedure's criteria for maximizing goodness of fit. For ease of exposition, we chose the second-best segmentation, yielding a break in 2001 (not in boldface). Also for ease of exposition, the 2008-2011 period is shown separately for all countries even when no break in 2007 was identified. A small discrepancy in the decomposition of net lending in 1971-1997 and 1998-2011 in France exists due to lack of data on capital transfers for the 1970s.

The Netherlands is unique in that non-financial corporations have been net lenders since at least 1980; in other words, the net accumulation of financial assets by these firms has been a structural feature of the Dutch economy for the last 30 years rather than a phenomenon of the 2000s, as in the previous three European countries. Still, there remains a striking similarity among all of them in that net lending increased dramatically in the 2000s.

This common pattern of declining net borrowing, and even positive net lending by non-financial corporations is consistent with the view that non-financial corporations in these countries have become increasingly financialized (Lazonick and O'Sullivan 2000, Stockhammer 2004, Orhangazi 2008 and 2011, and Davis 2013). To the extent that this is the case, it also calls into question the traditional roles of the financial sector as the intermediary that makes funds available for capital accumulation by non-financial corporations, while raising issues regarding the role of finance beyond the behavior of the financial sector itself.

4.4 France

France has conformed with the trend observed in the United States in that a lower share of capital expenditures has been externally financed in recent years compared to the 1970s. In 1971-1985 almost 50% of capital expenditures were externally financed. Our procedure identified two

downward brakes — in 1985 and 1991 —, and in 1992-1999 the average ratio had fallen to nearly 0%. An upward break was identified in the 2000s, with the average ratio reaching 15%.

Table 3 suggests that the decline in the use of external finance in the mid 1980s owes itself to a large increase in saving against relatively stable capital expenditures; by contrast, a decline in the latter explains the further decline in the use of external finance in the 1990s. Unlike the other countries in the sample, French non-financial corporations increased capital expenditures in the 2000s; since saving remained constant, they again became net borrowers in the period.

The privatization of both financial and non-financial firms during the decades in which the use of external finance declined may partly explain the sharp fall in the financing gap of French corporations (in that regard, see Galizia's (2003) comments on Italy during the 1970s and 1980s).

4.5 Relationship with Investment

The foregoing description suggested that, with few exceptions, a decline in the capital expenditures of non-financial corporations (as a share of GDP) went hand in hand with a decline in the share of these capital expenditures that was externally financed.

This pattern is not unique to the countries of our sample. We applied the Bai-Perron procedure to the full sample of the ESA95 database — comprising 27 European countries —, in addition to the United States. We then computed the changes in the average ratio of net borrowing to capital expenditures between two adjacent periods straddling a structural break. We also computed the change in average capital expenditures as a share of GDP between the same periods.

Figure 2 shows a scatter plot of the changes in these two variables for each country-period following a structural break. The points above the horizontal line denote upward breaks in the use of external finance by non-financial corporations, that is, breaks that denote an increase in the average ratio of net borrowing to capital expenditures. By the same token, the points below the horizontal line denote downward breaks. As we can see, most points fall in the odd quadrants, indicating that most breaks coincided with a change in capital expenditures (as a share of GDP) in the same direction.

The relation depicted in Figure 2 should not be interpreted causally, but it suggests several ways in which the behavior of non-financial corporations can cast light on the recent evolution of OECD economies.

To begin, this relation suggests that increases in retained earnings tend to lag behind increases in investment, causing the non-financial corporate sector to seek external sources to bridge the growing financing gap. By the same token, retained earnings also lag behind reductions in investment, resulting in a decline in the demand for external funds by non-financial corporations.

Thus, a reduction in capital investment by non-financial corporations tends to liberate net funds that could finance offsetting changes in the capital account of other domestic sectors in the economy, or of the rest of the world. As we will see, the household sector, which absorbed increasing amounts of finance in the United States since the 1980s and in the United Kingdom since the 1990s, provided such an outlet in these two countries.

5 Households and Non-Profit Organizations

We applied the same analytical procedure described above to the remaining domestic sectors, but now focusing on the flow of net lending as opposed to focusing on the share of capital expenditures that were externally financed. This change of focus acknowledges that the question of how to finance increases in the capital stock, which holds great interest in the case of non-financial

Figure 2: Non-Financial Corporations: Structural Breaks in the Use of External Finance and Capital Expenditures

Notes: For each period following a structural break in the mean of the ratio of net borrowing to capital expenditures, the figure plots the change in the average value of this ratio against the change in average capital expenditures as a share of GDP. The changes are computed relative to the period preceding the structural break. The solid black dots show the breaks for the countries described in this paper. The sample used to build the figure included the remaining European countries contained in the ESA95 database. The Bai-Perron procedure did not identify breaks in all of these countries. The countries for which at least one break was identified, along with the corresponding periods, are: Austria (1995-2001 and 2002-2007), Belgium (1985-1989, 1990-1997, and 1998-2011), Cyprus (1995-2004, and 2005-2011), Czech Republic (1995-1998, 1999-2007, and 2008-2011), Finland (1976-1988, 1989-1992, and 1993-2011), Hungary (1995-2001 and 2007-2011), Italy (1990-1993 and 1994-2011), Lithuania (1995-2007 and 2008-2011), Latvia (1995-2007, 2008-2011), Poland (1995-2001, 2002-2007, and 2008-2011), Portugal (1995-1998, 1999-2005, and 2006-2011), Slovenia (1995-2007 and 2008-2011), and Sweden (1995-1998, 1999-2011).

corporations, is less meaningful in the case of other sectors, especially households, which have typically been net lenders.

As a result, we calibrated the Bai-Perron procedure to test for changes in the mean of a series of net lending as a share of GDP. In the case of households and non-profit organizations, most countries exhibited sub-periods in which lend lending as a share of GDP was trending. To account for this fact, we also tested for structural breaks in a more general model including a linear trend. The results of both tests are in Table 4 below (for more details, see the Appendix).

5.1 United States

The first column of Table 4 shows that households were a net source of finance to other sectors during most years after 1950, with the excess of saving over capital expenditures showing a marked trend increase until the 1980s. These funds were partly channeled to non-financial businesses (which, as seen above, increased their reliance on external finance during the period), helping to fund the expansion of private nonresidential fixed investment. They also helped to finance a growing proportion of public capital expenditures and to make up for a declining contribution of saving by the financial sector, as seen below.

The remaining columns of Table 4 show that from 1956 to 1966 a fall in capital expenditures as a share of GDP explains most of the expansion in net lending — residential investment makes up a large share of household capital expenditures, and it fell as the post-war housing shortage in the United States came to an end.

Starting in the mid 1960s, in turn, a strong rise in household saving explains the expansion of net lending. The series peaked in 1981 and shortly thereafter it initiated an impressive dive that lasted until the eve of the 2008 crisis. The Bai-Perron procedure identified a trend reversal in 1984.

Until the late 1990s, a fall in saving as a share of GDP explains almost the entire reversal. Saving continued to decline in 1999-2007, but now in a context of rising capital expenditures as part of the boom in housing prices and construction.

In 1999 households and nonprofits became net borrowers of funds, a situation without precedent since the early 1950s. With the onset of the crisis — in which household indebtedness played an important role —, households, like non-financial businesses, sharply reversed their position as they attempted to restructure their balance sheets. Most of the restructuring of balance sheets after the crisis in 2008-2011 occurred through a reduction in capital expenditures, as opposed to an increase in saving.

5.2 United Kingdom and the Netherlands

In both the United Kingdom and the Netherlands net lending by households as a share of GDP displayed a steep fall in the late 1990s through the 2000s. Between 1990-1997 and 2004-2007, average household net lending fell by almost 7% of GDP in the United Kingdom. The same measure fell by almost 6% in the Netherlands between 1980-1993 and 1999-2011.

At the start of sample period, households in both countries were the main domestic source of saving to the rest of the economy. In the years before the 2008 crisis, by contrast, they made virtually no net contribution (on average) in the Netherlands, while in the United Kingdom they had become the largest domestic net borrowers.

A steep decline in household saving as a share of GDP is the primary reason for the decline in net lending, as evidenced by the decomposition in Table 4. In the immediate years before the 2008 crisis (2004-2007), a rise in residential investment exacerbated the effects of lower saving in the United Kingdom, as in the United States. Also like their American counterparts, British households sharply reversed their financial position in 2008-2011 in an effort to deleverage.

5.3 Germany, France, and Switzerland

In contrast to the countries examined above, Germany, France and, to a lesser extent, Switzerland did not see a significant decline in household net lending in the 2000s.

France had seen a secular decline in household net lending as a share of GDP between 1971 and 1991, due to a large decline in saving and despite a decline in capital expenditures. The early 1990s, however, saw a sharp increase in household saving, and household net lending as a share of GDP in 1992-2011 recovered the level it had held in the 1970s. The share also exhibited remarkable stability in the 2000s, and indeed no structural breaks were identified in the decade.

Germany is unique among the countries under study in that household net lending increased substantially in the 2000s. Indeed, between 1995 and 2005 household net lending rose by over 3% of GDP, with most of the increase taking place after 2000. Table 4 credits most of the increase to a fall in capital expenditures as a share of GDP.

Finally, Switzerland witnessed a small decline in household net lending as a share of GDP in 2003-2006 (due to a decline in saving), but it was already in reversal before the 2008 crisis broke out.

Table 4: Households and Non-Profits: Decomposition of Changes in Net Lending

			Change between Periods (% of GDP)		
		Average Net Lending (% of GDP)	Net Lending	Gross Saving (plus net capital transfers received)	Capital Expenditures
United States	1947-**1955**	0.38			
	1956-**1966**	2.03	1.65	-0.16	-1.81
	1967-**1985**	3.84	1.8	1.28	-0.51
	1986-**1998**	1.75	-2.09	-2.11	-0.02
	1999-2007	-1.29	-3.04	-1.73	1.31
	2008-2011	3.02	4.31	0.83	-3.47
	note: trend break in 1984				
United Kingdom	1990-**1997**	3.03			
	1998-**2003**	-0.86	-3.9	-3.12	0.78
	2004-**2007**	-3.93	-3.06	-1.57	1.49
	2008-2011	0.23	4.17	2.02	-2.15
	note: trend break in 2007				
Netherlands	1980-**1993**	6			
	1994-**1998**	3.67	-2.33	-1.39	0.92
	1999-2011	0.014	-3.656	-3.78	-0.123
	note: trend breaks in 1989 and 1998				
Germany	1995-**1998**	3.28			
	1999-**2002**	4.13	0.85	-0.53	-1.38
	2003-2011	5.89	1.76	0.76	-1
	note: trend breaks in 2000 and 2005				
Switzerland	1995-**2002**	6.69			
	2003-**2006**	5.13	-1.56	-1.85	-0.284
	2007-2011	7.36	2.23	1.76	-0.47
France	1971-**1978**	4.59			
	1979-**1985**	3.57	-1.02	-2.64	-1.53
	1986-**1991**	1.23	-2.34	-3.62	-1.29
	1992-2011	4.08	2.84	2.03	-0.8
	note: trend breaks in 1986 and 1992				

Note: The years in boldface indicate the breaks in the mean of the net lending as a share of GDP, as identified by the Bai-Perron procedure. The noted trend breaks correspond to breaks in the trend of net lending as share of GDP, also according to the Bai-Perron procedure (see the Appendix for more details on both tests). A small discrepancy in the decomposition of net lending in 1971-1978 and 1979-1985 in France exists due to lack of data on capital transfers for the 1970s.

6 Financial Corporations

6.1 United States

Financial corporations in the United States were net lenders during most of the era of regulated finance, at an average of 0.38% of GDP in 1947-1979 (see Table 5). The crisis at the turn of

the 1980s, however, hurt the sector's profitability, causing a sharp decline in saving as a share of GDP. Starting in the mid 1980s, saving recovered strongly, but the share of the sector's capital expenditures in GDP kept increasing; as a result, financial corporations were net borrowers during all of the 1980s.

An interesting question concerns the reasons for this large expansion in capital expenditures by financial corporations at that time. Presumably, they are associated with increased investment in computers and IT technology, partly to better provide financial services to customers. But in addition, it was during this period that there was a vast increase in the trading activities of financial institutions. These were trading activities associated with proprietary trading, intra-financial lending and other complex financial activities, whose contribution to productive economic has been now called into question (Montecino et al., 2014; Montecino and Epstein, 2014).

Saving caught up with capital expenditures in the 1990s, nearly closing the financial gap in the decade. The reemergence of the financial sector as a net lender occurred in the 2000s, driven primarily by an increase in the share of saving in GDP against a modestly declining share of capital expenditures. Save from a sharp reversal in 2008 — when the sector again became a net recipient of funds — the sector has remained a net lender since then[2].

The composition of financial institutions providing net funds, however, had changed dramatically by the 2000s compared with the era of regulated finance. Table 6 decomposes net lending by financial corporations into the four main components of the financial sector (excluding the monetary authority): private depository institutions, government-sponsored enterprises, insurance and pension funds, and other financial institutions. The decomposition shows that private depository institutions — which include credit unions and banks (both US-chartered and foreign banks with offices in the United States) — accounted for almost 80% of total net lending by financial corporations in 1947-1979.

In the 1990s and especially in the 2000s, by contrast, most of net saving has been provided by "other financial institutions", a catch-all category that includes most of the so-called "shadow" banking system (mutual funds, issuers of asset-backed securities, security brokers, etc.). These institutions accounted for over 80% of total net lending by financial corporations in 1999-2007.

The table also shows that gross saving by the shadow banking system has increased secularly since 1980, reflecting the increase in profits accruing to those institutions. Indeed, this increase in saving was the sole factor responsible for the expansion in net lending until 2007. This growth in shadow banking lending is, of course, consistent with the narratives of the financial crisis that have now become common (see, e.g., Crotty, 2009; Crotty and Epstein, 2009; Jarsulic, 2012).

6.2 United Kingdom, the Netherlands and Germany

As in the United States, financial corporations in the United Kingdom, the Netherlands and Germany displayed a substantial increase in net lending in the 2000s (in the Netherlands, the acceleration dates back to the mid 1990s). In the three cases, the expansion was driven by higher average saving, but it was often accompanied by a moderate fall in capital expenditures as a share of GDP.

The rise in average saving as a share of GDP was greatest in the United Kingdom, and in 2007-2011 the sector became the second largest domestic provider of net funds, just short of non-financial corporations (see section 8 below).

We present a decomposition of the sources of financial net lending in these three countries in Table A.3 in the Appendix. The ESA95 database classifies financial institutions into four

[2]Our conclusions are not affected if we exclude the monetary authority — which by default is classified as part of the financial sector —, even during the crisis years.

Table 5: Financial Corporations: Decomposition of Changes in Net Lending

			Change between Periods (% of GDP)		
		Average Net Lending (% of GDP)	Net Lending	Gross Saving (plus net capital transfers received)	Capital Expenditures
United States	1947-**1979**	0.38			
	1980-**1989**	-0.51	-0.89	-0.015	0.88
	1990-**1998**	-0.06	0.45	0.54	0.08
	1999-2007	0.58	0.64	0.56	-0.09
	2008-2011	0.83	0.25	0.1	-0.13
United Kingdom	1990-**2002**	-0.03			
	2003-**2006**	1.2	1.23	0.93	-0.32
	2007-2011	3.03	1.83	1.82	0.01
Netherlands	1980-**1993**	0.34			
	1994-2011	1.14	0.8	0.5	-0.29
Germany	1995-**2001**	0.19			
	2002-2011	0.92	0.73	0.44	-0.28
Switzerland	1995-**2006**	3.93			
	2007-2011	-1.25	-5.18	-5.47	-0.29
memo:	2007-2008	-4.49	-8.42	-8.64	-0.22
memo:	2009-2010	1.98	6.47	6.34	-0.13
France	1971-**1997**	1.33			
	1998-2011	0.69	-0.64	-0.35	0.26
memo:	1998-2001	0.21	-1.12	-0.84	0.25
memo:	2002-2011	0.88	0.67	0.68	0.005
	note: trend breaks in 1995 and 2002				

Note: The years in boldface indicate the breaks in the mean of the net lending as a share of GDP, as identified by the Bai-Perron procedure. The noted trend breaks correspond to breaks in the trend of net lending as share of GDP, also according to the Bai-Perron procedure (see the Appendix for more details on both tests). A small discrepancy in the decomposition of net lending in 1971-1997 and 1998-2011 in France exists due to lack of data on capital transfers for the 1970s.

categories (in addition to the monetary authority): *monetary financial institutions* (deposit-taking intermediaries, such as commercial and savings banks); *other monetary financial intermediaries* (intermediaries that do not take deposits, such as security and derivative dealers and financial vehicle corporations); *financial auxiliaries* (which do not engage in financial intermediation, such as non-issuing security and derivative brokers); and *insurance and pension funds*. For more detailed definitions, see the notes to Table A.3 and European Comission (1996).

With the exception of the Netherlands in 2001-2011, data was not available for all of these subsectors. To circumvent this problem, we aggregated the missing sectors and calculated their contribution to total net lending as a residual[3]. When interpreting the contribution of these sectoral aggregates, it is important to recognize that it is impossible to determine which of their components is driving the results.

With this limitation in mind, it is still possible to make exploratory inferences. The main

[3]The fact that we had to use data from Financial Transactions as opposed to Capital Transactions also prevented us from the decomposing changes in net lending into changes in gross saving and capital expenditures.

result seems to be that, unlike the case of the United States, "traditional" financial institutions — as opposed to the shadow banking system — played the most important role in the expansion of net lending in the three countries.

As the table shows, most of the expansion in net lending in the Netherlands in 1994-2011 was carried out by insurance and pension funds and, at least until 2000, by deposit-taking institutions. These two types of institutions were also prominent in explaining the rise of financial net lending in Germany in 2002-2011.

In the United Kingdom, in turn, insurance and pension funds played a relatively minor role, and the bulk of the expansion during the 2000s appears to have been carried out by deposit-taking institutions — although in that case it is impossible to separate their contribution from that of financial auxiliaries (e.g. asset brokers). But in the United Kingdom intermediaries that do not take deposits (e.g. security and derivative dealers, investment vehicles) also accounted for a noticeable share of the expansion in net lending, though not in as dominant a fashion as in the United States.

Table 6: United States: Decomposition of Net Lending by Component of Financial Sector

			Change between Periods (% of GDP)		
		Average Net Lending (% of GDP)	Net Lending	Gross Saving (plus net capital transfers received)	Capital Expenditures
Private	1947-1979	0.3			
Depository	1980-1989	-0.19	-0.49	-0.21	0.27
Institutions	1990-1998	0.09	0.29	0.15	-0.13
	1999-2007	0.1	0.007	-0.18	-0.18
	2008-2011	0.22	0.11	0.16	0.04
Government-	1947-1979	0.008			
sponsored	1980-1989	0.017	0.009	0.015	0.005
Enterprises	1990-1998	0.019	0.001	0.0011	0
	1999-2007	0.024	0.005	0.004	-0.001
	2008-2011	0.042	0.01	0.026	0.009
Insurance and	1947-1979	0.15			
Pension Funds	1980-1989	-0.104	-0.257	-0.114	0.143
	1990-1998	-0.26	-0.16	-0.112	0.05
	1999-2007	0.02	0.28	0.301	0.01
	2008-2011	0.071	0.051	0.01	-0.041
Other Financial	1947-1979	-0.083			
Institutions	1980-1989	-0.223	-0.14	0.31	0.45
	1990-1998	0.098	0.32	0.48	0.16
	1999-2007	0.47	0.37	0.47	0.09
	2008-2011	0.38	-0.09	-0.23	-0.14

Note: Excludes the monetary authority.

6.3 Switzerland and France

Contrary to the other European countries just described, financial corporations in Switzerland maintained a share of net lending in GDP from 1995 through 2006. But the lack of an acceleration should not conceal the fact that, at an average of almost 4% of GDP, average net lending by financial corporations in Switzerland was higher (as a share of GDP) than in any other country in the study.

Swiss financial corporations suffered heavy losses in 2007 and 2008, and as a result of negative saving the sector abruptly became a net borrower. But as shown in the memo in Table 5, the recovery of saving and net lending was swift in 2009 and 2010.

France exhibited a similar, though less extreme pattern in 1998-2011. In this period average net lending as a share of GDP was lower than in 1971-1997, leading the Bai-Perron procedure to identify a change in mean. The main reason for the break was the acute profitability crisis of the late 1990s. Starting in 2002, however, net lending by financial corporations has undergone a steady recovery, as a result of an increase in saving (see the corresponding memo item in table 5).

Lack of data for France and Switzerland prevented us from decomposing total net lending by financial corporations into the contributions of different types of institutions.

7 The General Government

7.1 United States

The government sector — which aggregates the federal, state, and local governments — has been a net borrower in most years since the early 1950s. With regard to average net borrowing as a share of GDP, three periods were discerned by the Bai-Perron procedure before the 2008 crisis (see Table 7 below).

Reliance on external finance for government capital expenditures becomes significant in the late 1950s. A break was identified in 1957, with net borrowing averaging 1.74% of GDP in 1957-1981. During this decade, however, average government saving was positive and equal to about 2.7% of GDP, implying that part of these capital expenditures were internally financed.

The testing procedure identified another downward shift in net lending in 1981, and between 1982-2007 and 1958-1981 average annual net borrowing increased by over 2% of GDP. The sole reason for this shift was a fall in saving, as average capital expenditures also fell as a percent of GDP. In fact, gross saving became negative during most of the 1980s and early 1990s, implying that the United States government relied on external finance to finance current as well as capital expenditures.

A substantial reduction of the current deficit was achieved in the remainder of the 1990s, to the point that the government ended the decade as a net lender. But tax cuts and increased spending in the early 2000s reversed the trend, preventing the Bai-Perron procedure from identifying a structural break.

After 2008, current deficits rose again as a result of the countercyclical policies put in place to fight the ongoing crisis, causing increased net borrowing by the government.

7.2 The United Kingdom, the Netherlands, and France

The United Kingdom, the Netherlands, and France share the common feature that, as in the United States, current government deficits behaved countercyclically after the onset of the current crisis. As a result of lower saving, the government in all three countries increased net borrowing in 2008-2011 compared with previous periods.

The United Kingdom and France are also similar in that these countercyclical policies were preceded by a period during which the government had increased net borrowing. By contrast, an upward break in the mean of government net lending (as % of GDP) was identified in 1995 in the Netherlands, with the sector displaying a relatively balanced financial position in the ensuing period of 1996-2007.

Table 7: Government: Decomposition of Changes in Net Lending

			Change between Periods (% of GDP)		
		Average Net Lending (% of GDP)	Net Lending	Gross Saving (plus net capital transfers received)	Capital Expenditures
United States	1947-**1957**	0.27			
	1958-**1981**	-1.74	-2.01	-2.19	-0.1729
	1982-2007	-3.44	-1.7	-2.82	-1.12
	2008-2011	-9.59	-6.15	-6.075	0.078
United Kingdom	1990-**2007**	-2.95			
	2008-2011	-8.5	-5.54	-4.83	0.71
Netherlands	1980-**1995**	-4.76			
	1996-**2007**	-0.709	4.05	3.95	-0.1
	2008-2011	-3.63	-2.92	-2.29	0.62
Germany	1995-2011	-2.7	-	-	-
Switzerland	1995-**2005**	-1.49			
	2006-2011	0.9	2.4	2.01	-0.39
France	1971-**1980**	-0.91			
	1981-**1991**	-2.65	-1.74	-2.62	-0.25
	1992-**2007**	-3.5	-0.84	-1.01	-0.16
	2008-2011	-5.8	-2.29	-2.21	0.07

Note: The years in boldface indicate the breaks in the mean of the net lending as a share of GDP, as identified by the Bai-Perron procedure (see the Appendix for more details). A small discrepancy in the decomposition of net lending in 1971-1997 and 1998-2011 in France exists due to lack of data on capital transfers for the 1970s.

7.3 Germany and Switzerland

The experiences of Germany and Switzerland contrast with that of the other countries in this study in that, compared with the previous period, the countercyclical response of fiscal policy was either muted (Switzerland) or quickly reversed (Germany), preventing the Bai-Perron procedure from identifying structural breaks after 2007.

The procedure in fact identified only one break in Switzerland in 2005, with the ensuing 2006-2011 period featuring lower, not higher net borrowing by the government.

8 Patterns of Intersectoral Financing

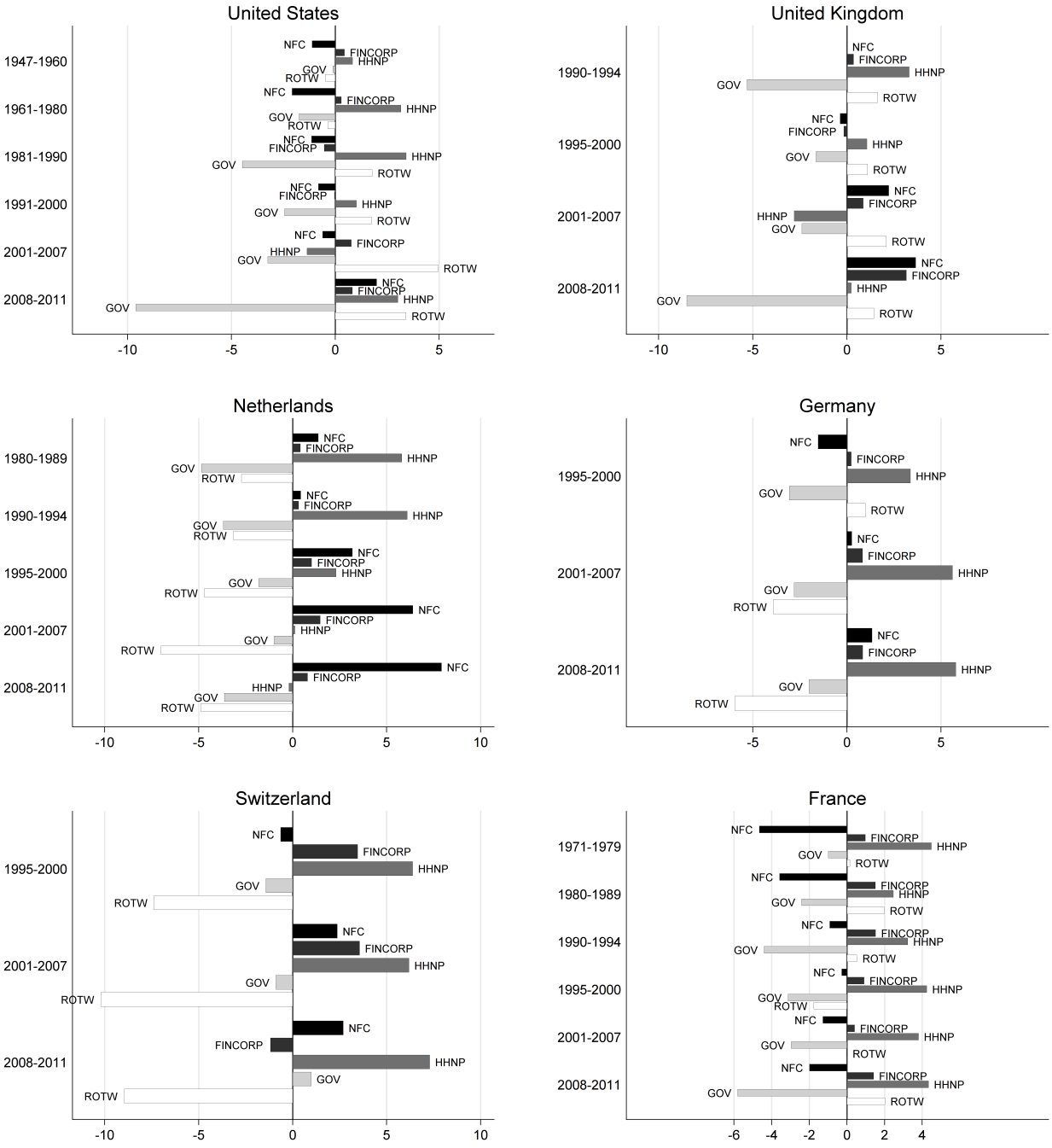
We now combine the sectoral trends described above in order to examine their cumulative effects on the pattern of intersectoral financing in each country.

The panels in figure 3 show average sectoral net lending as a share of GDP in each country, now including the rest of the world as a sector. Positive bars indicate net lending, so that a positive white bar, representing net lending by the rest of the world, indicate that the country has run a current account deficit in the period.

In order to understand the patterns therein, however, it is useful to use a typical pattern of intersectoral flows in a mature economy in the years of regulated finance as a benchmark. Unfortunately, data for the 1950s and 1960s are only available for the United States, and data

for the 1970s are only available for the United States and France. The pattern of intersectoral financing in these countries may not be a robust benchmark for the pre-1980 period, and individual countries may have deviated from it in the past for structural reasons. With these caveats in mind, however, we will refer to them to cast the current patterns of intersectoral financing in historical light.

Figure 3: Net Lending by Sector (% of GDP)



Note: The panels show average net lending by sector as a share of GDP during each period. **NFC** denotes Non-Financial Corporations, **FINCORP** denotes Financial Corporations, **HHNP** denotes Households and Nonprofits, **GOV** denotes Government, and **ROTW** denotes Rest of the World.

As figure 3 shows, in these benchmark years in both France and the United States, non-financial corporations were net borrowers (while financial corporations were net lenders, as in recent years);

households were important net lenders, while the government was a net borrower. In other words, households (and to a lesser extent financial corporations) were the typical source of funds to meet the financing needs of both the government and non-financial corporations. With this benchmark in mind, the figure suggests that important departures have occurred in the recent period.

We find it useful to divide the countries into three groups. The first group is comprised of the United States, the United Kingdom, and the Netherlands. It is characterized, first, by the fact that non-financial corporations have either become less reliant on external finance (as in the United States since the 1980s) or become net lenders to the rest of the economy (as in the United Kingdom, and the Netherlands). The group is also characterized by the fact that households have reversed their position — from being the main source of saving for capital formation to becoming a net recipient of saving sometime between the late 1990s and the mid 2000s. In the extreme case of the United Kingdom, for example, the 2001-2007 period saw corporations (both financial and non-financial) financing the net accumulation of financial liabilities by households — a clear inversion of the benchmark pattern.

The main dimension along which these countries diverge is in the behavior of the government sector in 2001-2007. While in the United States and United Kingdom the government absorbed additional funds (as a share of GDP), in the Netherlands it liberated funds; this is part of the reason why the Netherlands accumulated growing current account surpluses in the 1990s and 2000s, unlike the United States and the United Kingdom.

The second group, in turn, is comprised of Germany and Switzerland. It is characterized by a behavior on the part of non-financial firms that is similar to that of the first group, but also by the fact that households either maintained previous levels of net lending in 2001-2007 (Switzerland), or expanded net lending as a share of GDP (Germany). In addition, in both of these countries net borrowing by the government remained in check during the period. With all domestic private sectors running financial surpluses, both countries accumulated large current account surpluses.

Finally, the third group — comprised only of France — is characterized by maintaining (or even deepening) the benchmark pattern of intersectoral financing. Net lending by households and non-profits remained high in the 1990s and 2000s, while net borrowing by non-financial corporations increased.

These findings suggest a pattern whereby the economies whose financial sectors led the way in financial innovation and complex trading — the United States, the United Kingdom and, to a lesser extent, the Netherlands — were also economies in which the household sector made a dramatic conversion from a net supplier of funds to a net borrower during key periods in the lead up to the financial crisis, while non-financial corporations became less reliant on external funds or even transitioned to a position of net lending.

9 Conclusion

The recent decades of financial deregulation were accompanied by important changes in the level and composition of private fixed investment and in the net acquisition of assets by all sectors — financial and non-financial alike.

We found that the recent growth of financial activities has — perhaps paradoxically at a first sight — coincided with a reduction in the need of external finance for productive capital investment undertaken by non-financial corporations in almost all the countries analyzed. In the United Kingdom, Germany, the Netherlands, and Switzerland, non-financial corporations became important net providers of funds in the years before the 2008 crisis.

Periods of reduced use of external finance by non-financial corporations were accompanied by a decline in their capital expenditures as a share of GDP. Indeed, in the United States, the

United Kingdom, Germany, and the Netherlands a fall in the share of capital investment in GDP explained most of the reduction in net borrowing (or increase in net lending) by non-financial corporations.

Before the 2008-2011 crisis, moreover, this fall in capital expenditures as a share of GDP was accompanied by higher retained earnings in all these countries. In other words, lower capital investment did not result from lower profits. It rather suggests a change in corporate portfolio decisions towards the acquisition of net financial assets.

In the United States, the United Kingdom and, to a lesser extent, in the Netherlands, the rise and liberalization of finance has also coincided with the emergence of households as net borrowers during the 1990s and 2000s. In the United Kingdom, the combination of these two trends led to a pattern of intersectoral financing during most of the 2000s that was the inverse of the typical benchmark of the era of regulated finance — corporations (and the rest of the world) provided net finance and households absorbed it, a pattern of questionable sustainability.

Finally, with the exception of Switzerland, all countries in the study saw a noticeable increase in net lending by financial corporations as a share of GDP between the mid-1990s and the early 2000s. This rise was stoked by higher profits. In the United States, especially, this rise in net lending was associated with a vast expansion of the shadow banking system, which was greatly implicated in the 2008 financial crisis. In some episodes, such as Switzerland in 1995-2006 and the United Kingdom in 2007-2011, financial corporations were in fact responsible for a sizable share of the total net flows of saving. An implication is that the saving and investment behavior of financial corporations can be a major source of aggregate demand fluctuations in these countries.

Quite apart from their direct role as net providers of funds, however, the financial sectors of the countries analyzed above played a role, as financial intermediaries, in enabling deep changes in the financial behavior of non-financial sectors. The role of financial innovation, deregulation, and perverse incentives in enabling excessive borrowing by households serves as an example, as emphasized by narratives of the great financial crisis (see, e.g.: Crotty, 2009; Crotty and Epstein, 2009).

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A Appendix

A.1 Data Sources

Tables A.1 and A.2 below show the data series used in the construction of the net lending, gross saving, and capital expenditures measures.

Table A.1: United States Flow of Funds: Data Sources

Series	**Sector**	**Series Code**
GDP	—	FA086902005
Net lending	Rest of the World	FA266000105
Capital expenditures	Non-financial Corporations	FA145050005
	Households and Nonprofits	FA155050005
	Financial Corporations	FA795019005
	Government	FA365019005 + FA365420005
	Government-Sponsored Enterprises	FA405013005
	Private Depository Institutions	FA705013005
	Insurance Companies and Pension Funds	FA545013005 + FA575013005 + FA515013005 + FA225013005
	Private Financial Institutions, n.e.c.	FA615013005 + FA645013005 + FA645012063 + FA665013005 + FA675013025 + FA735013005
Gross saving plus net capital transfers	Non-financial corporations	FA146000105
	Households and nonprofits	FA156000105
	Financial corporations	FA796000105
	Government	FA366000105
	Government-Sponsored Enterprises	FA406000105
	Private Depository Institutions	FA706000105
	Insurance Companies and Pension Funds	FA516000105 + FA546000105 + FA576330005 + FA226330005
	Private Financial Institutions, n.e.c.	FA616000105 + FA656006403 + FA666000105 + FA646000105 + FA676330023 + FA736000105

Table A.2: ESA95 Data Sources

Series	**Series Code**
GDP	B1GM
Capital Expenditures	P5+K2
Gross saving plus net capital transfers	D9 (received) - D9 (paid) + B8G
Net Lending	B9
Sectors	**Sector Codes**
Total Economy	S1
Non-Financial Corporations	S11
Financial Corporations	S12
Government	S13
Households and nonprofits	S14_S15
Rest of the World	S2
Central bank	S121
Other monetary financial institutions	S122
Other financial intermediaries, except insurance corporations and pension funds	S123
Financial auxiliaries	S124

Note: Net lending for the components of the financial sector was obtained from financial transactions data, as opposed to capital transactions. Net capital transfers were calculated as the difference between capital transfers received and capital transfers paid.

A.2 Description of the Bai-Perron Methodology

In this section, we discuss the methodology of the structural break tests employed in the paper, drawing on Bai and Perron (2002).

A.2.1 The case of changes in the mean

Given our interest in dating changes in the mean of the series, we specified the baseline model for each segment as

$$\begin{aligned} Y_t &= a_1 + \epsilon_t, \quad t = 1, ..., T_1 \\ Y_t &= a_2 + \epsilon_t, \quad t = T_1 + 1, ..., T_2 \\ &\vdots \\ Y_t &= a_{m+1} + \epsilon_t, \quad t = T_m + 1, ..., T \end{aligned} \tag{1}$$

where Y denotes the variable of interest — the share of sectoral net lending in GDP, the ratio of net lending to capital expenditures, or the share of private fixed investment in GDP. In turn, t denotes time measured in years and ϵ_t denotes a random disturbance. The general model in (1) above allows for m structural breakpoints and $m + 1$ corresponding segments. The years in which each break occurred are identified by $(T_1, ..., T_m)$. To each segment there corresponds an estimated intercept (a_i).

The goal of the Bai-Perron procedure is to estimate the number of breakpoints m and the years in which they occurred $(T_1, ..., T_m)$. Unlike the standard Chow-type tests, the Bai-Perron procedure does not require that the researcher identify breakpoint candidates based on prior knowledge or on visual inspection of the series. Its demands are less stringent, requiring that the researcher (i) identify a baseline model as in (1) above; (ii) select a minimum segment length h, so that $h \geq T_i - T_{i-1}$; and (iii) employ a decision criterion based on goodness of fit for selecting among the possible estimates yielded by the procedure.

As described in the main text, the minimum segment length h was set at 15% of the sample for the United States and at 4 years for the European countries. The procedure then begins by estimating the optimal breakpoints *given* the total number of breaks, from one to the maximum allowed by the choice of h. It then tackles the problem of selecting the optimal number of breaks.

Given the number of breaks m, the procedure will first identify all possible combinations of break dates. Each combination of break dates $(T_1, ..., T_m)$ is called a partition and denoted by $\{T_j\}$. The only constraint on the identification of partitions is that $h \geq T_i - T_{i-1}$. Having identified all partitions, the procedure then fits equation (1) to each of the $m+1$ segments of each partition. The resulting coefficient estimates are used to calculate the sum of squared residuals associated with each partition, that is, a sum across segments of the sum of squared residuals associated with each segment. The sum of squared residuals associated with partition $\{T_j\}$ is denoted $S_T(T_1, .., T_m)$. Formally:

$$S_T(T_1, .., T_m) = \sum_{i=1}^{m+1} \sum_{t=T_{i-1}+1}^{T_i} [Y_t - \hat{a}(\{T_j\})_i]^2$$

where $T_0 = 0$, and $\hat{a}(\{T_j\})_i$ denote the OLS estimate of a for segment i of partition $\{T_j\}$.

The optimal breakpoints (given the number of breaks m) are estimated by finding the partition with the lowest associated sum of squared residuals. Formally, the estimated breakpoints are given by

$$(\hat{T_1}, ..., \hat{T_m}) = \text{ argmin }_{T_1,...,T_m} S_T(T_1, .., T_m)$$

The procedure is then repeated for all possible number of breaks. Having estimated the breakpoints for each m, it is now time to select the optimal number of breaks. In this paper, we use the Schwartz Bayesian Information Criterion (BIC) for doing so, since it is robust to trending series. The method consists of finding the number of breaks m that — given the optimal partition — has the lowest associated residual sum of squares. Since increasing the number of breaks necessarily reduces the residual sum of squares, however, a simple comparison of these would bias the choice towards too high a number of breaks. To address this problem, the BIC includes a penalty for choosing additional breaks:

$$BIC(m) = ln[T^{-1}S(\hat{T_1}, ..., \hat{T_m})] + [(m+1)q + m + p]\frac{ln(T)}{T}$$

where m is the number of breaks, q is the number of explanatory variables whose coefficients are subject to shifts, and p is the number of explanatory variables whose coefficients are assumed constant. Since we do not consider partial structural breaks in this paper, $p = 0$. The optimal number of breaks is then chosen by minimizing $BIC(m)$.

A.2.2 The case of changes in the trend

As described in the main text, in some cases (especially net lending by households) we also tested for changes in the trend of the series. In those cases, the baseline model was specified as

$$\begin{aligned} Y_t &= a_1 + b_1 t + \epsilon_t, \quad t = 1, ..., T_1 \\ Y_t &= a_2 + b_2 t + \epsilon_t, \quad t = T_1 + 1, ..., T_2 \\ &\vdots \\ Y_t &= a_{m+1} + b_{m+1} t + \epsilon_t, \quad t = T_m + 1, ..., T \end{aligned} \tag{2}$$

where b denotes a linear trend. The more general model in (2) allows for breaks both in the trend and in the intercept. The testing procedure was conducted as described above.

All the structural break tests were conducted using the R package *strucchange* (Zeileis et al., 2003).

Table A.3: European Countries: Decomposition of Net Lending by Component of Financial Sector

	Total						**Aggregates of Missing Sectors**	
	Financial Corporations	Monetary Financial Institutions	Insurance and Pension Funds	Other Monetary Financial Intermediaries	Financial Auxiliaries	Central Bank	Central Bank, Auxiliaries and Monetary Financial Institutions	Central Bank and Financial Auxiliaries
	(1)=(2)+(3)+(4)+ +(5)+(6)	(2)	(3)	(4)	(5)	(6)	(2)+(5)+(6)	(5)+(6)
United Kingdom								
1990-2002	-0.31	-	-0.70	-0.82	-	-	1.21	
2003-2006	1.21	-	-0.61	-0.09	-	-	1.90	
2007-2011	3.05	-	-0.40	0.31	-	-	3.13	
Netherlands								
1990-1993	0.16	0.48	-0.23	-0.08	.	-		0.00
1994-2000	1.01	0.79	0.02	0.19	.	-		0.00
2001-2011	1.23	0.38	0.74	-0.05	0.10	0.06		-
Germany								
1995-1997	0.28	-	-0.04	-0.04	-	-	0.35	
1998-2001	0.14	-	-0.16	-0.01	-0.02 (memo)	-	0.31	
2002-2011	1.10	-	0.21	0.02	0.05 (memo)	-	0.87	

Note: Notes: A discrepancy in average net lending by Financial Corporations with respect to Table 5 in the main text may occur due to the fact that the present table was obtained with Financial Transactions, as opposed to Capital Transactions data. The "aggregates of missing sectors" column shows the aggregate figures (calculated as a residual) of the sectors for which individual data was not available for the periods shown. **Monetary Financial Institutions** include primarily deposit-taking institutions engaged in financial intermediation (e.g. commercial and savings banks). **Other Monetary Financial Instermediaries** include primarily institutions engaged in financial intermediation by incurring liabilities in forms other than currency, deposits or close substitutes for deposits (e.g. security and derivative dealers and financial vehicle corporations). **Financial Auxiliaries** include institutions primarily engaged in activities closely related to financial intermediation but which are not financial intermediation themselves (e.g. non-issuing security, loan and derivative brokers). For more detailed definitions, see European Comission (1996)