

# CORPORATE BALANCE SHEET ADJUSTMENT: STYLIZED FACTS, CAUSES AND CONSEQUENCES

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## 1. Introduction

There is now ample evidence that deep economic crises are associated with stress in public and private sector balance sheets and followed by protracted periods of balance sheet adjustment<sup>1</sup>. However, while economists have recently spent much time assessing sovereign debt and the financial health of banks, the balance sheets of non-financial corporations have been subject to less scrutiny. This paper endeavours to fill the gap by analysing the causes and sometimes substantial and persistent macroeconomic consequences of balance sheet adjustment processes in the non-financial corporate sector.

Balance-sheet adjustment can be captured by changes in corporate net lending or borrowing (NLB). Corporate NLB measures corporations' net needs in terms of external finance (if negative) or, alternatively, their net financial investments (if positive). In the euro area, corporate NLB increased significantly following the downturn of the early 2000s, rising by more than 3 percentage points of GDP between 2000 and 2004 before decreasing again during the recovery (see Graph 1). The global economic crisis has left a similar footprint on euro-area corporate net lending which surged again by more than 3 percentage points between its pre-crisis trough and its recession peak, entering into positive territory. NLB has fallen somewhat with the recovery but remains high by historical standards. Similar cyclical developments can be observed in the US where corporate net lending has remained firmly in positive territory since the global financial crisis.

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**Graph 1: Net lending / borrowing of non-financial corporations, euro area and US**  
(1999Q1 to 2011Q2; in % of GDP)

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**Graph 2: Corporate debt, euro area and US**  
(1)  
(1999Q1 to 2011Q2, % of GDP)

Based on a combination of case study and panel econometrics, this paper analyses the typical pattern of corporate balance sheet adjustment episodes, their main drivers and their macroeconomic impact. A better understanding of these patterns will inform policy makers regarding the speed and shape of the recovery. Moreover, corporate balance sheet adjustment has been an important driver of current account surpluses in some euro-area Member States over the past decade<sup>2</sup>. Understanding the determinants of corporate balance sheet adjustment is therefore critical for a better understanding of the factors driving current account divergences within the euro area.

An important strand of the finance literature investigates the determinants of corporate balance sheets. This literature offers two competing models of financing decisions and balance sheet structure. In the trade-off model, firms identify their optimal leverage ratio by weighing the costs and benefits of additional debt. The benefits of debt include, for example, the tax deductibility of interest and the disciplining effect of debt in case of agency problems between managers and shareholders (Jensen, 1986). The cost of debt includes potential bankruptcy costs and others. In the pecking order model (Myers and Majluf, 1984), equity issuance and, to a lesser degree, debt issuance comes with a cost due to asymmetric information between managers and investors. In this model, companies prioritise their sources of financing, using internal funds first before resorting to debt and ultimately equity. The pecking order model predicts that a firm's debt issuance is an inverted function of its net cash flows (cash earnings minus investment layouts). Fama and French (2002) test both models with firm-level data and find supporting and contradicting evidence for both models, suggesting that both of them may partially hold.

Our paper is partially related to the literature on optimal capital structures. Indeed, we test if balance sheet adjustment processes are more likely to occur when corporate debt is high, corporate liquidity is low or asset prices are falling. Implicitly, we thus assume that the corporate sector targets optimal balance sheet ratios. However, our paper differs from the corporate finance literature insofar as we do not study firm level data but macroeconomic aggregates. In particular, the paper relies on flow-of-funds data that have recently become popular (Be Duc and Le Breton, 2009; Bezemer, 2009; and Castren and Kavonius, 2009). Moreover, we do not specify specific balance sheet items as targets but rather focus on the more general net lending/borrowing of the aggregate non-financial corporate sector. This allows us investigate the macroeconomic consequences of balance sheet adjustment processes, notably in terms of GDP growth, and to shed some light on the linkages between finance and the business cycle.

Several factors could explain the current high level of corporate NLB. First and foremost, non-financial corporations showed signs of high indebtedness before the onset of the financial crisis. Corporate debt increased rapidly in the euro area in the late 1990s and, after a pause over 2002-04, picked up again in the run-up to the global financial crisis pushing the ratio of debt to GDP up by almost 40 percentage points between 1999 and 2009 (see Graph 2). A pick up in corporate debt was also visible in the US in pre-crisis years but on a much lower scale, with an overall increase of the debt ratio of only 5 percentage points over the same period. These figures are suggestive of an unsustainable debt dynamics, particularly in the euro area. Sorensen et al (2009) actually estimate that by the end of 200

euro-area corporate sector was as much as 15 percent (ie corporate debt was as much as 15 percent above its estimated equilibrium level). Judging by intra-area differences in the pace of debt accumulation over the past decade, the overhang could be considerably larger in some Member States. Since the mid-1990s the ratio of (non-consolidated) debt to GDP has increase by about 70-80 percentage points in countries such as Belgium, Portugal and Spain.

Graph 3: **Equity prices in the euro area**  
(1987Q1= 100, 1987Q1 to 2011Q3) (1)

Graph 4: **House prices in selected euro-  
area countries**

euro area<sup>3</sup>. A persistent downshift in the economy's growth path would make corporate strategies involving high leverage more risky and could lead to an overall lower level of corporate debt.

Beyond the causes of the ongoing balance sheet restructuring, it is also important to assess its broader economic consequences. A considerable body of empirical literature has examined the impact of firms' financial structure on investment. Starting with the seminal paper by Fazzari et al. (1988), much of this literature has focused on whether and how the importance of credit constraints could be assessed on the basis of the sensitivity of investment to changes in the cash flow. In recent years, a number of studies have also looked into the impact of leverage and other balance sheet measures on capital formation (see for instance Martinez-Carrascal and Ferrando, 2008).

However, it is important to stress that balance sheet adjustment affects the economy and growth not only through the investment channel but also through an income channel. Faced with the need to consolidate balance sheets, corporations can also squeeze labour and intermediate costs in order to raise the required cash. To the best of our knowledge, this income channel has remained little discussed in the literature, despite its potentially important macroeconomic consequences.<sup>4</sup>

The remainder of this paper aims to shed more systematic light on these factors. Section 2 studies two important episodes of balance sheet adjustment in the recent history namely Japan in the 1990s and Germany in the early 2000s. Section 3 characterises the pattern of typical balance sheet adjustment episodes in a sample of 30 countries. Section 4 offers an econometric analysis of the main drivers of past episodes of balance sheet adjustment. The last section concludes and draws lessons for the ongoing recovery.

## 2. Balance sheet adjustment: lessons from Japan and Germany

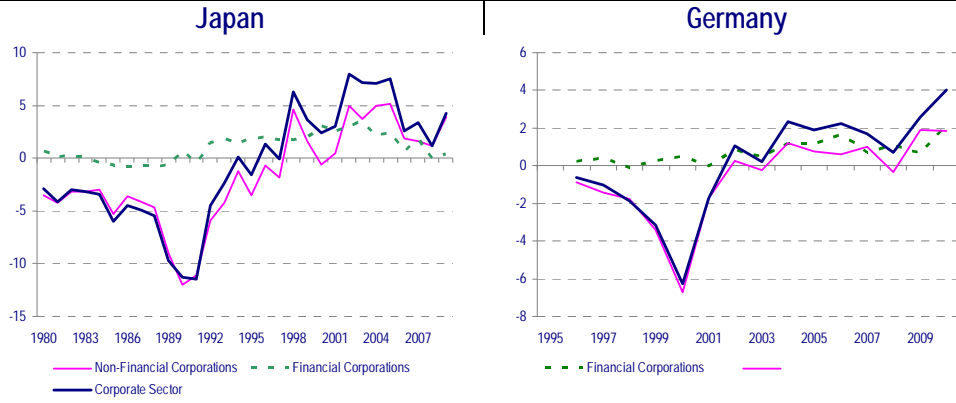
As shown in Graph 5, Japan and Germany experienced episodes of substantial rises in corporate NLB starting, respectively, around the mid-1990s and in the early 2000s. These shifts in the level of NLB have proved to be particularly persistent: in both countries, corporate NLB currently remains in positive territory and has not yet returned to its normally negative territory. Most of the increase took place in the non-financial corporate sector although the financial corporate sector also played a role. During these episodes, changes in NLB in the corporate sector had a strong impact on macroeconomic aggregates and were in particular key drivers of demand, GDP growth and the external balance. For example, the current account balance in Germany increased by 8.8 percentage points of GDP between 1999 and 2007, of which 5 percentage points are attributable to the corporate sector (see Wolff 2010 for a discussion).

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<sup>3</sup>See, for instance, European Commission (2009).

<sup>4</sup> Exceptions include Benito and Hernando (2007) and Hernando and Martinez-Carrascal (2008).

Graph 5: Corporate net lending/borrowing  
(% of GDP)





and the availability of credit from banks deteriorated. The increasing relative costs of bank loans due to the restructuring of the German financial system could have increased the pressure on the non-financial corporate sector (Schumacher, 2006) Finally, Germany introduced a major tax reform in 2001, which affected corporate as well as income taxation. This likely influenced the saving decisions of the German non-financial corporate sector. Changes in the corporate tax law favoured internal relative to external financing. In particular, the quantitatively most important reduction in tax revenue due to the tax reform stems from a decrease of the tax rate on retained profits from 40 to 25 percent while the reduction in distributed profit taxes was smaller falling from 30 to 25 percent. The Bundesbank highlights





### BOX 1: SOME ACCOUNTING IDENTITIES AND CONCEPTS

National accounts distinguish between five institutional sectors (households, financial corporations, non-financial corporations, government and the rest of the world). For each sector the following concepts are available:

GOS: gross operating surplus  
VA: value added  
GS: gross savings  
GBPI: gross balance of primary income  
GDI: gross disposable income  
GS: gross savings  
NLB: net lending or borrowing

These concepts are linked by the following identities:

$$\text{GOS} = \text{VA} - \text{labour compensation} - \text{production taxes} + \text{production subsidies} \quad (1)$$

$$\text{GBPI} = \text{GOS} - \text{Net property income} \quad (2)$$

$$\text{GDI} = \text{GBPI} + \text{net current transfers received} - \text{current taxes on income and wealth} \quad (3)$$

$$\text{GS} = \text{GDI} - \text{Adjust. for the change in net equity of households on pension funds} \quad (4)$$

$$\text{NLB} = \text{GS} - \text{investment} - \text{other capital expenditure} \quad (5)$$

$$\text{NLB} = \text{net acquisition of financial assets} - \text{net incurrence of liabilities} \quad (6)$$

Net lending or borrowing (NLB) can be derived from two sets of accounts. In the income accounts of the institutional sectors, it corresponds to the difference between savings (after tax profits minus dividend payments) and investment (see equations (1) to (5)). But NLB is also the balancing variable of the financial transactions accounts. It is then the difference between the acquisition of financial assets and the incurrence of new liabilities (equation (6)).

Corporate NLB is normally negative, reflecting the fact that the corporate sector is a net recipient of financial capital from other institutional sectors. Corporations tend to issue more liabilities than they acquire financial assets because the additional financial capital is also used for physical investment (machines, buildings, etc). But NLB may also move temporarily into positive territory when the corporate sector becomes a net acquirer of financial assets or pays back its debts. This may reflect unexpected shocks (eg a decrease in the income tax rate or a reduction in investment opportunities) to which corporations will adapt quickly (eg by increasing distributed profits and thereby reducing savings) or a deliberate attempt to alter balance sheets. In the latter case, the move into positive territory can be lasting. Balance-sheet adjustment can indeed turn out to be rather long processes due to the larger size of stock variables (balance-sheet variables) relative to flow variables (NLB). For instance, with a level of corporate debt close to 100 percent of GDP in the euro area, a 10 percent cut in debt would require an increase in NLB of 2 percent of GDP during 5 years.

Finally, it is also worth mentioning that national accounts now also include detailed accounts on both the financial transactions and balance sheets of institutional sectors. These allow to analyse developments in typical balance-sheet ratios (eg the debt to equity ratio, debt to GDP ratio) and to identify the financial transactions that are the counterpart to a changes in NLB (eg whether the additional internal funds from an increase in NLB have been used to pay back debt or swap external capital with internal capital).

Table 1 characterises the observed episodes of corporate balance sheet adjustment for those countries, for which financial account stock data are available<sup>12</sup>. We show the development in time of a number of central variables, starting from the year prior to the balance sheet adjustment episode ( $t=0$ ) up to the year  $t=4$ . The set of countries is kept constant during this period so that changes in the values are not driven by changing samples. For different variables, the data availability is different and this explains the different number of observations per variable considered.

**Table 1: Consequences of corporate balance sheet adjustment (1)**

	t=0	t=4	Actual change (2)	Average change in entire sample	Effect of balance sheet adjustment	Number of episodes
	(A)	(B)	(C)=(B)-(A)	(D)	(E)=(C)-(D)	(F)
Debt / GDP	60.3	58.4	-1.9	5.2	-7.1	12
Leverage (3)	101.2	85.3	-15.9	-1.2	-14.7	12
Liquidity / VA (4)	30.0	33.4	3.4	0.9	2.5	10
Investment / VA	26.1	23.2	-2.9	-0.2	-2.8	16
Savings / VA	17.2	22.3	5.0	0.4	4.6	16
Compensation of employees / VA	60.2	55.6	-4.6	-0.9	-3.7	20
Real growth			6.6	9.9	-3.3	24

(1) To ensure a constant size of the sample for every year, the table covers only those events which lasted more than 4 years and for which the respective data are available. The number of observations per variable differs due to data availability reasons. Period.  $t=0$  is the year prior to the balance sheet adjustment. "VA" is value added.

(2) In the case of "real growth" the actual change is the difference between the cumulated growth during the 4-year adjustment period and the cumulated growth in the broader sample during an average 4 year period.

(3) Leverage is measured by the ratio of debt to equity (data from the balance sheet section of national accounts).

(4) Liquidity is measured by corporations' holdings of "currency and deposits" (data from the balance sheet section of national accounts).

A number of interesting stylised facts on corporate balance sheet adjustment processes can be derived from the table.

(1) The Debt to GDP ratios are significantly reduced, in particular when compared to the overall sample, in which debt tends to follow an upward trend. Similarly, corporate leverage (ie the ratio of debt to equity) is reduced significantly by almost 16 pp.

(5) Investment in percent of corporate value added equally falls substantially by around 3 percentage points.

The descriptive evidence from a large sample of corporate balance sheet adjustment episodes thus confirms that corporate balance sheet adjustments have very large and significant effects on wages, investment, savings and corporate balance sheets themselves. Indeed, the descriptive evidence supports the notion that corporate balance sheet adjustments have strong income effects as they are associated with persistent periods of wage moderation. The rise in corporate gross savings is therefore mostly achieved by weakening labour remuneration. Moreover, the results highlight that investment is subdued during episodes of corporate balance sheet adjustment. Corporate balance sheets are thus adjusted by reducing investment and increasing savings on the back of falling labour cost, with the latter channel of adjustment being at least as large as the former. Hence, looking at the overall growth effect of balancing sheet consolidation only via the investment channel – as is frequently done in forecasting exercises – means ignoring half of the picture, ie the effect of consolidation on the income distributed by corporations and ultimately on private consumption. Finally, corporate balance sheet adjustment is found to be associated with significant decreases in leverage and debt as well as sizeable increase in liquidity held by the corporations.

Understanding the drivers of corporate balance sheet adjustment will be of large policy relevance as the consequences of balance sheet adjustment are substantial. An econometric study in the next section aims to discern a number of key drivers.

#### 4. Determinants of balance sheet adjustment: panel econometric evidence

We have defined balance sheet adjustment episodes in the last section. To capture the triggers of the balance sheet adjustment, the balance sheet adjustment variable is set to one only when the adjustment starts<sup>13</sup>. The variable takes on a value of one or zero and is our dependent variable. As the dependent variable is binary, a probit estimation approach is warranted. Put in simple terms, the probit equation uncovers to what extent the right hand side variables increase the probability to observe an episode of balance sheet adjustment.

More formally:

$$P\{y=1 \mid x\}=F(x)$$

where the probability to observe a balance sheet adjustment is a function of the vector of explanatory variables  $x$ , which reflect economic fundamentals. For  $F$  a standard normal distribution function is chosen so that a probit model is chosen.

As explanatory variables  $x$  for the corporate balance sheet adjustment we include the main factors identified in the case studies. In particular, we include the first difference in the real GDP growth variable and capital shocks to economic growth (see Appendix 2.2.7 for details). We have also included the first difference in the real interest rate and the first difference in the real exchange rate. We have also included the first difference in the real interest rate and the first difference in the real exchange rate. We have also included the first difference in the real interest rate and the first difference in the real exchange rate.

equity. Finally, we include the first difference of the main national stock market index (Dax, Cac40 etc.). All variables are included with the first lag to avoid reverse causality problems.

#### 4.1 Main results

Table 2 presents our main estimation results. A number of variables turn out to significantly increase the likelihood of observing a corporate balance sheet adjustment event. First, we find that a negative shock to economic growth will significantly increase the likelihood of the corporate sector to perform a balance sheet adjustment in the next year. We also find a significant role of negative stock market shocks. However, due to the relatively large correlation with economic growth, the effects of the two variables cannot clearly be

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Table 2: Determinants of balance sheet adjustment

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A

B

C

D

E

F

G

H

I

J







Table 5: Results with country specific fixed effects

	A	B	C	D	E	F	G	H	I	
Change in real GDP growth (t-1)	<b>-22.72</b>	<b>-29.12</b>	<b>-26.64</b>	<b>-18.29</b>					<b>-16.62</b>	
	-4.07	-3.39	-3.02	-1.55					-1.35	
Corporate debt/VA (t-1)		<b>0.04</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.06</b>	<b>0.07</b>	<b>0.09</b>	<b>0.06</b>	<b>0.07</b>
		3.19	3.42	3.26	3.55	4.12	3.78	3.29	3.56	
Corporate liquidity/VA (t-1)			<b>-0.10</b>	<b>-0.10</b>	<b>-0.11</b>	<b>-0.12</b>	<b>-0.10</b>	<b>-0.11</b>	<b>-0.11</b>	
			-1.91	-1.84	-1.98	-2.3	-1.65	-1.84	-1.95	
Change in stock market index (t-1)				<b>-0.67</b>	<b>-1.56</b>			<b>-0.68</b>	<b>-1.47</b>	
				-0.72	-2			-0.69	-1.82	
Long term real interest rate (t-1)							<b>0.15</b>			
							1.36			
N	330	204	204	198	198	204	181	171	171	

Note: Probit estimation. VA stands for value added.

In a different robustness check, we propose an alternative approach to identifying balance sheet adjustment. We define balance sheet adjustment as an episode, where the corporate sector increases its gross savings by 0.2 percent of GDP while at the same time it reduces gross investments by 0.2 percent. Such a definition might be particularly suited to capture deliberate decisions by the corporate sector to adjust balance sheets. This definition excludes all those events, where shocks drive both, investment and savings in one direction but with different strength so that it would falsely appear as a balance sheet adjustment. Such a situation can arise for example in a business cycle downturn, where investment falls more strongly than savings leading to an increase in corporate net lending. This alternative definition excludes such episodes and focuses on those events where in fact corporations deliberately increase savings and decrease investments.

Table 6 presents the estimation results for this different definition of balance sheet adjustment periods. We find our previous results again confirmed. There is both a role for the macroeconomic conditions as well as balance sheet variables in determining balance sheet adjustments.

	A	B	C	D	E	F	G
Change in real growth (t-1)	<b>-11.02</b>	<b>-17.06</b>	<b>-16.33</b>	<b>-11.38</b>			
	-2.72	-2.63	-2.46	-1.4			
Corporate debt/VA (t-1)		<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>	<b>0.01</b>
		2.33	2.72	2.47	2.65	2.93	2.63
Corporate liquidity/VA(t-1)			<b>-0.02</b>	<b>-0.02</b>	<b>-0.02</b>	<b>-0.02</b>	<b>-0.02</b>
			-2	-2.01	-2.09	-2.15	-1.94
Change in stock market index (t-1)				<b>-1.02</b>	<b>-1.42</b>		
				-1.7	-2.63		
Long term real interest rate (t-1)							<b>0.01</b>
							0.17
N	430	259	259	250	250	259	235

Note: A balance sheet adjustment episode is defined by a simultaneous increase in savings and decrease in investment. VA is value added.

Overall, the robustness checks confirm that balance sheet adjustment processes are triggered by macroeconomic downturns as well as high debt, low liquidity of the corporate sector and falling stock markets.

## 5. Conclusion

The global economic crisis has put banks' balance sheet in the spotlight, showing the strong potential impact of imbalances in the financial sector on the functioning of the real economy. The analysis presented in this paper suggests that the balance sheets of non-financial corporations should also feature prominently in macroeconomic surveillance because of the possible large effects of balance sheet adjustments in that sector on domestic demand, GDP growth and the current account.

We identify balance sheet adjustment episodes as periods during which corporations raise significantly their net lending (NLB). Our analysis of a sample of adjustment episodes in

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