

Focus

I. Balance sheet adjustment in the corporate sector

The global economic crisis is associated with a significant adjustment of corporate balance sheets. This focus section presents an analysis of past episodes of large balance sheet adjustments in the corporate sector of advanced economies. Based on a sample of 31 episodes, adjustment is found to last on average 8 years. It is associated with sizeable macroeconomic consequences, including losses in GDP growth and strong falls in investment. Moreover, balance sheet adjustment translates into weaker growth of the wage bill, which in turn weighs on domestic demand and economic growth, a channel not so far explored in the economic literature. Case studies from Japan and Germany together with an econometric analysis show that adjustment episodes can be triggered by corporate over-indebtedness, stock market declines, business cycle downturns and negative shocks to GDP growth. Moreover, a deterioration of financial intermediation as well as changes in the tax system may cause or prolong adjustments. Due to its likely impact on risk attitudes and on the growth potential, the current crisis is likely to be associated with significant balance sheet adjustment weighing on economic growth, in particular in euro-area countries with large corporate debt overhang. Fixing banks' balance sheets and frontloading growth reforms under the Europe 2020 initiative will lessen the negative consequences of the adjustment.

The global economic and financial crisis has been associated with significant adjustments of private-sector balance sheets. Whereas economists' attention has generally focused on households' efforts to deleverage in the wake of falling house prices, there is also evidence that corporations have been going through an important adjustment process. This focus section presents an analysis of past balance sheet adjustment processes in the corporate sector of advanced economies. It discusses both the implications of the adjustment for the real economy and its likely causes. On the basis of the analysis of past trends, it then assesses potential risks to the recovery posed by the ongoing corporate deleveraging process in the euro area.

I.1. Assessing the macroeconomic effects of changes in corporate balance sheets

Corporate balance sheets depict the structure of assets as well as liabilities such as debt and equity holdings. The structure of the balance sheets of individual corporations responds to changing economic and financial conditions, including growth prospects, asset prices, taxation and interest rates. For example, large shocks to asset prices may significantly alter balance sheets, thereby triggering a balance sheet adjustment process. In normal times, changes in balance sheets of individual firms have little effect on the economy. Occasionally, when the economy is hit by major shocks, the sum of these micro-transformations may, however, be sufficiently large to have significant macroeconomic consequences.

Under very strict assumptions (perfect capital markets, no bankruptcy costs and a neutral tax system), changes in the structure of balance sheets should leave the value of the firm unaffected and should not influence output decisions (Modigliani and Miller 1958).⁽¹⁾ When these assumptions do not hold, however, the structure of balance sheets depends on economic conditions and firms' financial decisions can no more be separated from their output decision. Modern finance theory has emphasised the possible interactions between balance-sheet structure and the non-financial side of the economy when capital markets and information are imperfect.⁽²⁾ In a world of imperfect access to equity and debt markets, deleveraging may require a period of cost cutting aimed at raising internal funds. This paves the way for a possible impact of major episodes of balance-sheet restructuring on GDP growth.

Measuring balance sheet adjustment at the macroeconomic level

National accounts provide a range of data to analyse developments in corporate balance sheets at the macroeconomic level. In particular, Eurostat's financial accounts include a balance sheet section which makes it possible to track developments in a number of aggregate indicators for the corporate sector, including debt to equity ratios, debt to GDP ratios and liquidity measures.

(1) Modigliani, F. and M. Miller (1958), 'The cost of capital, corporation finance and the theory of investment', *American Economic Review*, Vol. 48, pp. 261-97.

(2) See for instance Hubbard, G.L. (1998), 'Capital-market imperfections and investment', *Journal of Economic Literature*, Vol. 36 (March), pp. 193-225.

These stock data have their counterparts in flow data, particularly in income accounts for the corporate sector. In this focus section, episodes of significant balance sheet adjustment at the macroeconomic level are identified by large and persistent increases in a variable extracted from income accounts: 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). A persistent rise in NLB marks corporations' efforts to raise internal funds in order to restructure balance sheets either by reducing debt or by accumulating financial assets.

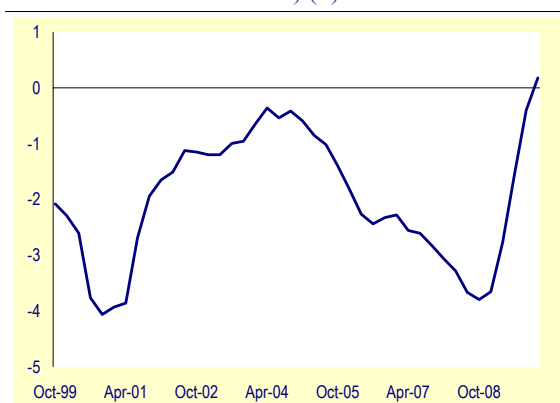
Balance sheet restructuring does not necessarily imply an increase in NLB. For instance, deleveraging can be achieved by raising new funds on equity markets. In a world of integrated global capital markets, such an operation should have only limited short-term effects on real activity. In contrast, deleveraging achieved by raising internal funds will have a measurable short-term impact on demand. NLB is indeed the difference between savings and investment (see Box I.1 for a description of the underlying accounting). An increase in corporate NLB can therefore be achieved either by raising corporate savings or by reducing corporate investment. In both cases the impact on demand is negative, either directly via lower corporate investment or indirectly via a cut in the corporate income distributed to workers and capital holders. NLB is therefore a key variable to monitor when assessing the short- to medium-term impact of balance sheet adjustment on GDP growth.

1.2. Past episodes of balance sheet adjustment

Corporate NLB has fluctuated substantially in the past in the euro area. As Graph I.1 shows, there is a strong cyclical element to these movements. Following the bursting of the dot-com bubble and during the ensuing recession, euro-area corporate NLB increased from -4% to -0.5% of GDP in 2004. It then fell steadily up to the beginning of the current crisis. During the current crisis, corporate NLB has again moved upwards sharply and has now reached a positive level. The corporate sector is therefore now a net provider of finance to the rest of the economy. Similar sharp rises in NLB have also been observed in a range of EU countries in the aftermath of big recessions.

Notwithstanding these recent cyclical movements of NLB in the euro area, historical evidence shows that corporate balance sheet adjustment can also be very protracted in advanced economies. Box I.2 describes two typical examples of balance sheet adjustments in Germany and Japan that have lasted 10 to 15 years. In Japan, the adjustment started in 1991 and is still ongoing. In Germany, the adjustment began in 2001 and is probably also still ongoing.

Graph I.1: Corporate NLB, euro area (in % of GDP) (1)



(1) Corporate net lending or borrowing (NLB). Based on quarterly national account data. 4 quarters backward moving average. Latest observation is 2010Q1.

Source: Eurostat, non-financial quarterly sector accounts, Commission services.

To go beyond the German and Japanese examples and shed more systematic light on balance sheet adjustment and its consequences, this focus section draws on the analysis of a broad sample of balance sheet adjustment episodes. The sample includes the 27 EU countries together with the US and Japan and covers the last three decades. A balance sheet adjustment event is defined as an increase in corporate NLB larger than 2% of GDP, which lasts for more than one year.⁽³⁾ In the sample, 31 episodes were identified. On average, the adjustment episodes lasted for 8.3 years but there is substantial variation in the length of the adjustment, with a standard deviation of more than 5 years. Overall, the analysis of these episodes confirms that balance sheet adjustments can be very protracted.

⁽³⁾ More details are presented in Ruscher and Wolff (2010), 'Corporate balance sheet adjustment: stylised facts, causes and consequences', *European Economy — Economic Paper* (forthcoming).

Box I.1: Some useful accounting identities and concepts

National account data provide a full set of income accounts for the corporate sector. The following concepts can be useful when assessing balance sheet consolidation processes:

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

These concepts are linked by the following identities:

$$\begin{aligned} \text{GOS} &= \text{VA} - \text{labour compensation} - \text{production taxes} + \text{production subsidies} & (1) \\ \text{GBPI} &= \text{GOS} - \text{Net property income} & (2) \\ \text{GS} &= \text{GBPI} + \text{net transfers received} - \text{taxes on income and wealth} - \text{other} & (3) (*) \\ \text{NLB} &= \text{GS} - \text{investment} - \text{other capital expenditure} & (4) \\ \text{NLB} &= \text{net acquisition of financial assets} - \text{net incurrence of liabilities} & (5) \end{aligned}$$

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 and investment (equations (1) to (4)). 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 (5)).

Corporate NLB is normally negative, reflecting the fact that the corporate sector is a net recipient of financial capital from other sectors of the economy (e.g. households). Corporations tend to issue more liabilities than they acquire financial assets because they need to raise financial capital to finance 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. As can be seen from equations (1) to (4), corporations can mostly increase NLB by reducing wages, investment and capital payments (i.e. net property income) or by increasing value added (i.e. raising output prices). Government can affect corporate NLB via transfers and taxes.

National accounts also include detailed accounts on both the financial transactions and balance sheets of the various sectors of the economy (corporations, households etc...). These allow to analyse developments in typical balance-sheet ratios (e.g. the debt to equity ratio, debt to GDP ratio) and to identify the financial transactions that are the counterpart to a changes in NLB (e.g. whether the additional internal funds from an increase in NLB have been used to pay back debt or swap external capital with internal capital).

(*) The "other" category covers the "adjustment for the change in net equity of households in pension fund reverses" and is generally small.

1.3. Consequences of balance sheet adjustment

Balance sheet adjustment episodes can have important macroeconomic consequences. For Germany and Japan, Box I.2 presents evidence that the balance sheet adjustment was used to reduce the debt burden of the corporate sector. It also had a strong impact on aggregate demand, with a combination of weaker investment and higher gross savings in both countries. The increase in savings was achieved on the back of either wage moderation (Germany) or a reduction in net property income (Japan).

To assess more systematically the consequences of episodes of balance sheet adjustment, Table I.1

shows the development of a number of key variables for the larger sample of 31 balance sheet adjustment episodes described above. It shows the value of the variables in the year prior to the adjustment and in year 4 of the adjustment. To gauge the effect of the adjustment, the change during the balance sheet adjustment is compared to the change that typically happens in the entire sample (i.e. all years for which data are available irrespective of the existence of a balance sheet adjustment).

A number of results stand out. First, changes in corporate NLB are associated with major changes in a number of balance sheet variables. Corporate indebtedness falls by around 2 percentage points

Table I.1: Consequences of 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 for 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).

Source: Commission services.

of GDP. This stands in contrast to the average increase of 5 percentage points of GDP occurring in the sample during a four-year period. Compared to the entire sample as a benchmark, the balance sheet adjustment has an effect of 7 percentage points of GDP on corporate debt. Similarly, corporate leverage (i.e. the ratio of debt to equity) is reduced by almost 16 percentage points. There is also a small build-up of corporate liquidity.

Adjustment can have significant effects on growth ...

Second, the adjustment is associated with significant macroeconomic effects. Real economic growth during the four-year adjustment period is significantly below the average growth in the sample. While in the full sample cumulated growth over four years is almost 10%, growth in the adjustment episodes amounts to only 6.6%, leaving GDP 3.3% lower than it could have been without the adjustment.⁽⁴⁾

... via investment and the wage bill

The analysis identifies two principal drivers of the weaker growth performance. First, the adjustment is achieved by significantly lowering investment. Lower investment in turn leads to losses of aggregate demand and economic growth. Second, there is a strong reduction in the share of labour compensation in value added. In the adjustment

sample, corporate wage payments decrease by 4.6 percentage points of value added. To raise the internal funds needed to fix balance sheets, corporations tend to cut their wage bill by reducing either wages or the labour force. The resulting curb on the wage share puts a drag on disposable income and ultimately on private consumption. In terms of aggregate demand, this wage bill channel actually emerges as more important for aggregate demand than the investment channel. It has so far been little discussed in the economic literature, which has tended to focus on the impact of changes in balance sheets on investment.

I.4. Causes of balance sheet adjustment

As corporate balance sheet adjustments can have significant effects on the economy, understanding their drivers is critical. There is a rich literature which explores the determinants of the structure of corporate balance sheets.⁽⁵⁾ For example, transactions costs of debt issuance as well as managers' superior information about the firm's prospects may lead to increased reliance on retained earnings for new investments thereby lowering leverage ratios.⁽⁶⁾ On the basis of firm-level data, the microeconomic literature generally finds that corporations adjust their balance sheets in response to changes in balance sheet ratios such

⁽⁴⁾ These numbers obviously reflect a two-way causality as balance sheet adjustment can affect GDP growth but changes in GDP can also trigger changes in balance sheets.

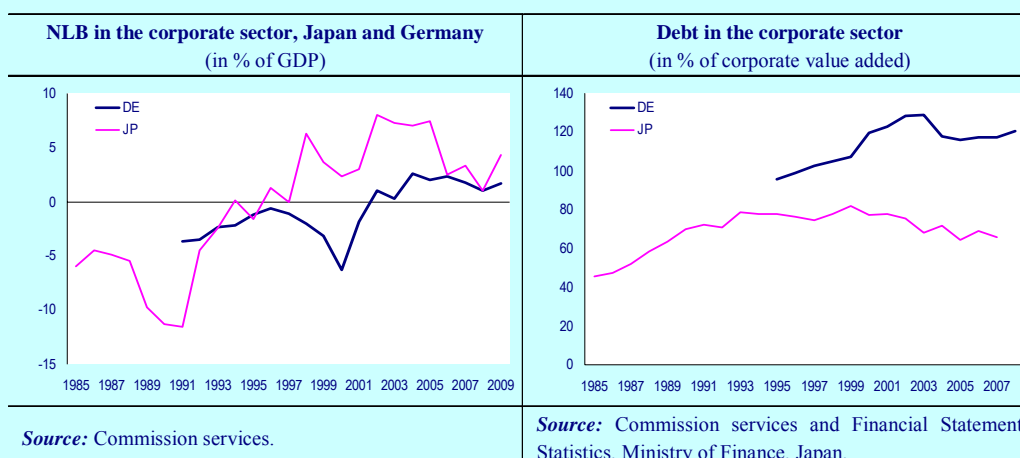
⁽⁵⁾ For example, Fama, E.F. and K.R. French (2002), 'Testing trade-off and pecking order predictions about dividends and debt', *The Review of Financial Studies*, Vol. 15, No 1, pp. 1-33.

⁽⁶⁾ For example, Myers, S.C. (1984), 'The capital structure puzzle', *The Journal of Finance*, Vol. 39, pp. 575-592.

Box I.2: Balance sheet adjustment in Germany and Japan: similarities and differences

Both Germany and Japan have experienced very protracted and significant episodes of balance sheet adjustment in the corporate sector (see left panel of graph below). In Japan, the balance sheet adjustment started in 1991, lasted for around 15 years and involved an increase in corporate net lending/borrowing (NLB) by more than 15 percentage points of GDP. In Germany, there was an upward shift in corporate NLB around the turn of the century. While its magnitude was far smaller than in Japan, it was nevertheless very significant in economic terms, amounting to a shift of around 3 percentage points of GDP.

In both countries, the balance sheet adjustment process significantly transformed corporate balance sheets. As the right panel of the graph shows, in Germany as well as Japan, corporate indebtedness increased rapidly in the years preceding the balance sheet adjustment. In contrast, the consolidation process was associated with phases of stabilisation and/or fall of indebtedness. This suggests that part of the internal funds made available by the rise in NLB was used to reduce debt stocks. In the case of Germany, there is also evidence of corporate liquidity build-up (i.e. an accumulation of liquid assets). However, there is no evidence of a similar trend in Japan.



In both countries, the increase in corporate NLB resulted from both a fall in corporate investment and an increase in corporate savings (see the table below). Interestingly, both countries had, however, different strategies to achieve the rise in corporate savings. In Japan, in a situation of falling gross value added, the compensation of employees was held fairly constant and savings increased thanks to a sharp fall in net property income, with lower interest and/or dividend payments. In contrast, in Germany, corporate savings were raised by reducing the compensation of labour. The investment rate fell significantly in both countries.

Corporate balance sheet adjustment in Germany and Japan (changes in pp of GDP during the adjustment period) (1)					
	Investment	Savings	Wages	NFC wages	Net property income
DE	-1.8	4.0	-2.9	-6.5	0.2
JP	-4.9	8.8	N/A	0.8	-6.6

(1) Changes for the total corporate sector in percentage points of GDP except for 'NFC wages', where changes refer to changes in wage share in percent of value added of the non-financial sector. For DE, the change refers to 2000-2007 while for Japan it is 1990-2005.

Source: Ameco; for NFC wage share: Eurostat and Japanese Ministry of Internal Affairs, Statistics Bureau.

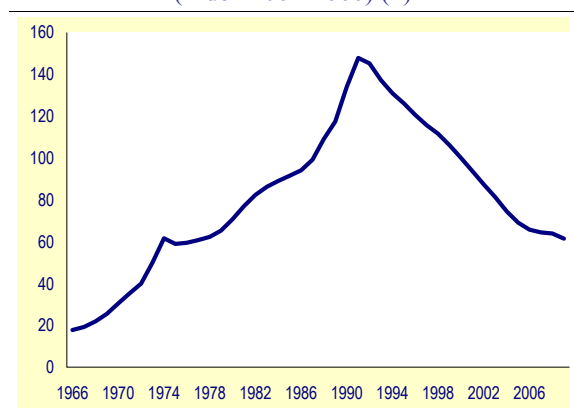
as leverage. There is, however, little empirical evidence on the causes of large balance sheet adjustments at the macroeconomic level. The detailed analysis of the specific episodes in Japan and Germany as well as an econometric analysis of the 31 episodes described above (see Box I.3) point to a number of factors that contribute to triggering large balance sheet consolidations.

First, **large shocks to asset prices** can trigger corporate balance sheet adjustment. In Japan, the collapse of the housing bubble (see Graph I.2) as well as the accompanying collapse of stock markets in the early 1990s put a large burden on Japanese corporate balance sheets. Also in Germany, there was a sharp stock market decline, which was particularly pronounced in the new

market segment that was actually closed in June 2003 (NEMAX, see Graph I.3).⁽⁷⁾

According to Koo (2003), Japanese corporations responded to the massive shock in asset price values in the 1990s by adjusting their balance sheets.⁽⁸⁾ As the companies were generating reasonable cash-flows, bankruptcy was rejected by many chief executives and instead the earnings from the core business were used to repay outstanding debt and improve balance sheets.⁽⁹⁾ This translated into a massive increase in corporate NLB. The econometric evidence presented in Box I.3 corroborates these results. It shows that balance sheet adjustments are more likely to occur following a drop in the stock market.

Graph I.2: Land prices in Japan (Index 100= 2000) (1)



(1) Index covers total average of urban land in Japan.

Source: Ministry of Internal Affairs and Communications, Statistics Bureau, Japan.

Second, **corporate indebtedness and high leverage** are a further factor determining corporate balance sheet adjustment. In the so-called trade-off model, firms target an optimal leverage ratio which depends on the costs and benefits of additional debt.⁽¹⁰⁾ In an uncertain and changing environment, this process may lead to periods of overshooting in the debt level. To the

⁽⁷⁾ The index continued to be computed up to 17 December 2004 to assure the continuity of derivatives transactions. For an in-depth analysis of the Neuer Markt, see von Kalckreuth, U. and L. Silbermann (2010), 'Bubbles and incentives: a post-mortem of the Neuer Markt in Germany', *Deutsche Bundesbank Discussion Paper* No 15.

⁽⁸⁾ Koo, R.C. (2003), 'Balance sheet recession: Japan's struggle with uncharted economics and its global implications', John Wiley and Son, Hoboken, USA.

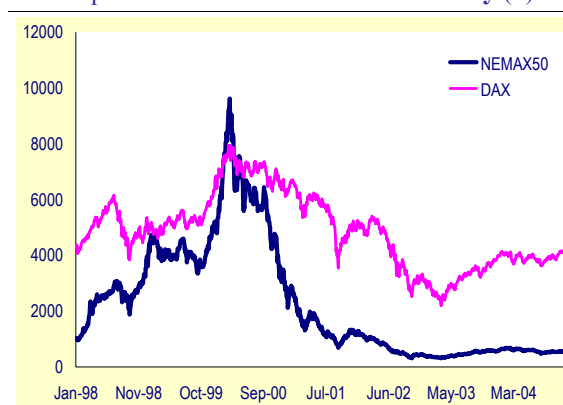
⁽⁹⁾ An alternative interpretation is that banks continued to roll over loans since they wanted to avoid realising large losses, see Caballero, R.J., T. Hoshi and A.K. Kashyap (2008), 'Zombie lending and depressed restructuring in Japan', *American Economic Review*, Vol. 98, No 5, pp. 1943-77.

⁽¹⁰⁾ See for example: Fama and French (2002), op. cit.

extent that they signal a deviation from the optimal leverage ratio, large debt levels or high leverage ratios should increase the likelihood of corporate balance sheet adjustments. This is confirmed by the econometric evidence in Box I.3. Balance sheet adjustments are significantly more likely to occur when the ratio of debt to GDP or leverage ratios are high.

Third, a **significant fall in economic growth** is also likely to trigger a phase of balance sheet consolidation. The econometric evidence presented in Box I.3 shows that a negative shock to growth in the year prior to the adjustment increases the likelihood of balance sheet adjustment. This seems to reflect a response of corporations to both cyclical and structural factors. On the one hand, faced with a temporary slump in activity, corporations tend to adopt more prudent financial behaviours. They postpone debt issuance and accumulate precautionary buffers in the form of liquid financial assets. This cyclical effect was successfully tested in the regressions using the output gap as a regressor. On the other hand, changes in the long-term growth potential alter the expected future income streams of corporations. This changes the optimal level of investment but also the optimal level of debt. Moreover, it also changes the time profile of financing needs, rendering a switch to internal finance more likely. The econometric evidence indicates that a fall in the long-term growth potential also increases the likelihood of balance sheet adjustments.

Graph I.3: Neuer Markt in Germany (1)



(1) Index NEMAX50 and DAX.

Source: Bloomberg.

Fourth, **changes in the cost of financing** can also trigger balance sheet adjustments in the non-financial corporate sector. There is some evidence

Box I.3: Determinants of balance sheet adjustments – Evidence from a large panel of countries

To get a better understanding of the macroeconomic factors that can trigger balance sheet adjustments, this box presents a probit analysis of past episodes of balance sheet adjustment in advanced economies. The probit estimation approach allows to test whether a range of explanatory macroeconomic variables increase the probability to observe an episode of balance sheet adjustment.

The sample of balance sheet episodes covers the 27 EU countries together with the US and Japan with data going as far back as the 1970s for some countries. A balance sheet adjustment event is defined as an increase of corporate net lending/borrowing (NLB) larger than 2% of GDP, which lasts for more than one year. Altogether, 31 episodes were identified in the sample. On average, the adjustment episode lasted for 8.3 years but there is substantial variation in the length of the adjustment with a standard deviation of more than 5 years.

The table below presents the main regression results. All explanatory variables were included with the first lag to mitigate reverse causality problems. *

Determinants of balance sheet adjustment (1)							
	A	B	C	D	E	F	G
$\Delta(\text{growth})(t-1)$	-7.80	-31.65	-31.44				
	-3.11	-4.57	-4.56				
debt/VA(t-1)		0.005		0.005	0.009		
		1.98		1.73	2.2		
liquidity/VA(t-1) (2)		-0.01	0.00	-0.01	-0.03	-0.01	0.00
		-0.82	-0.67	-1.39	-1.87	-0.6	-0.64
$\Delta\text{stock}(t-1)$				1.89	-1.70		
				3.1	-2.67		
leverage(t-1) (3)			0.01			0.00	0.01
			2.16			1.93	2.17
$\Delta(\text{sentiment})(t-1)$						-0.05	
						-3.31	
Output gap							-0.16
							-3.25
$\Delta(\text{potential growth})(t+1)$							-0.63
							-2.81
N	795	315	315	251	224	237	278
Pseudo R ²	0.04	0.21	0.21	0.14	0.16	0.15	0.17
Obs. excluded					Japan		

(1) Δ represents the first difference operator. Z-values below the coefficients

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

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

Source: Commission services.

The Probit estimations allow identifying several drivers of balance sheet adjustment episodes, including negative shocks to growth, high leverage and falls in equity prices. A fall in the rate of real GDP growth significantly increases the probability of observing a balance sheet adjustment (Column A). High indebtedness in the corporate sector also significantly raises the likelihood of balance sheet adjustments. This is true whether indebtedness is captured via the ratio of debt to value added (Column B) or via a measure of leverage (Column C), with the latter regressor showing a slightly stronger explanatory power. Regressions were also run using the first difference of the main national stock market index (Dax, Cac40 etc.) as regressor. They show that a negative shock to equity prices increases the probability of balance sheet adjustments (Column D). However, this variable is correlated with the growth variable which then becomes insignificant. The ratio of liquidity to valued added generally comes out as statistically insignificant. If, however, Japan (where liquidity developments have been very different from the typical pattern observed in other countries) is excluded from the sample, the liquidity coefficient becomes significant (Column E): a low level of liquidity raises the probability of occurrence of a balance sheet adjustment episode. Finally, tests were also carried out to assess the respective effects of the business cycle and long-term

(Continued on the next page)

Box (continued)

changes in potential growth. Regressors in regression F include the economic sentiment indicator to capture the business cycle. Results show that a drop in economic sentiment increases the probability of balance sheet adjustment. In regression G, the output gap and the expected change in potential growth (as proxied by estimates of potential growth for the next year) are both added as regressors. While this exercise should be taken with a grain of salt due to possible serious endogeneity problems, the results nevertheless suggest that balance sheet adjustments not only react to cyclical downturns but also to changes in long-term trends in potential growth.

Overall, results show that corporate balance sheet adjustments happen in response to bad balance sheet fundamentals, negative shocks to equity markets, sharp growth downturns as well as reductions in long-term growth potentials. Policies that facilitate balance sheet adjustment and improve bad balance sheet ratios therefore appear to be key factors in reducing the negative effects of protracted balance sheet adjustments on the economy.

* More detailed results and robustness checks are described in: Ruscher, E and G. Wolff (2010), "Corporate balance sheet: stylized facts, causes and consequences", *European Economy – Economic Paper*, forthcoming.

that changes in bank lending conditions could have contributed to the balance sheet adjustment in Germany.⁽¹¹⁾ In the regression analysis, no effect is found for the impact of the interest rate⁽¹²⁾ but, as noted earlier, financing costs as captured by stock market prices were found to be a significant determinant.

Fifth, a further factor influencing non-financial corporate balance sheet adjustments is the **functioning of the financial sector**. The NLB adjustment in Japan started before the Japanese credit crunch of 1997-98. So it is unlikely that the adjustment was triggered by difficulties in the financial intermediation sector. However, it was clearly aggravated by the credit crunch as evidenced by a surge in NLB of 7.5 pp of GDP in 1998. The negative effects of a dysfunctioning financial sector are, however, not restricted to episodes of credit crunch. Corporate NLB remained at high levels even after the credit crunch in Japan, pointing to continued reliance on internal finance despite an easing of credit conditions.

The literature on the Japanese crisis helps to understand how persistent difficulties in the financial sector can aggravate the negative macroeconomic impact of balance sheet adjustment in the non-financial corporate sector. Peek and Rosengren (2005)⁽¹³⁾ document that

credit continued to be extended to corporations with balance sheet difficulties by those banks that were closely affiliated to the respective companies (keiretsu), thereby locking capital into less productive incumbent firms. Caballero, Hoshi and Kashyap (2008) argue that subsidised lending to firms (i.e. lower requested interest payments) kept 'zombie' firms alive, slowed down adjustment and significantly weakened productivity and employment growth.

This 'zombie' story can be linked to a high level of NLB. Japanese corporations with severe balance sheet problems increased NLB to repair balance sheets. Instead of bankruptcy, they continued to survive as banks were willing to roll over outstanding debt in order to avoid acknowledging large losses.⁽¹⁴⁾ The 'special' relationship between banks and corporations in Japan thus slowed adjustment in the corporate sector with negative consequences for productivity growth while at the same time putting a drag on demand via higher corporate NLB. While stable bank-corporate relations can be beneficial during crisis times, interrelated linkages can also stifle adjustment and innovation after crisis. There is a need to investigate this in greater detail for euro-area countries.

Overall, a weak banking sector can therefore matter for adjustments in the non-financial corporate sector via two channels. First, a "credit crunch", i.e. a lack of external credit, forces companies to rely on internal finance. This will show up in rapidly rising NLB and weak growth of the credit constrained companies. Second, in the "zombie" case, rapid adjustment of balance

⁽¹¹⁾ Schumacher, D. (2006), "Capital markets and the end of Germany Inc", Goldman Sachs, *Global Economics Paper*, No. 144.

⁽¹²⁾ This may be due to the fact that, in the absence of proper series of corporate debt yields, only government bond yields were tested as a regressor.

⁽¹³⁾ Peek, J. and E.S. Rosengren (2005), 'Unnatural selection: perverse incentives and the misallocation of credit in Japan', *American Economic Review*, Vol. 95, No 4, pp. 1144-66.

⁽¹⁴⁾ Corporate defaults would have burdened the balance sheets of banks and increased stress in the financial system.

I. Balance sheet adjustment in the corporate sector

sheets in the non-financial corporate sector via bankruptcy is held back by continued bank lending to weak companies in the fear of credit losses if lending is terminated.

Finally, the **corporate governance system as well as the tax system** can influence corporate balance sheet behaviour. Corporate governance issues can influence the decision to rely on internal finance instead of debt. For example, in the absence of appropriate equity markets, small and medium-sized companies have stronger incentives to rely on internal finance than large companies. Corporate NLB could therefore be influenced by firm governance structures. ⁽¹⁵⁾

Tax issues could explain some of the German developments in NLB. In 2000, Germany passed a new tax law affecting corporations and households after 2000. ⁽¹⁶⁾ The reform included changes in income as well as corporate taxation. The Bundesbank in an article in its monthly bulletin of August 2000 discusses the allocation effects of the law. It is shown that corporate taxes on profits are reduced. The reduction is particularly significant for those profits that are retained in the company. An important conclusion drawn by the Bundesbank is therefore that this 'clear favouring of self-financing will tend to interfere with the allocation function of capital markets and will put young firms at a disadvantage.' ⁽¹⁷⁾ It is therefore plausible to relate part of the increase in corporate NLB after 2000 to the effects of the law. Moreover, it appears likely that this tax law actually weighed on the growth performance of the German corporate sector as a whole since it favoured incumbent firms.

Overall, this section has highlighted a number of drivers of corporate balance sheet adjustment based on two case studies and econometric evidence. The results show that corporate balance sheets are adjusted in response to large asset price shocks and high debt or high leverage in the corporate sector. Moreover, a fall in growth and growth potential can contribute to triggering an adjustment. The results also indicate that problems in the financial system can aggravate non-financial corporate balance sheet adjustment

processes. Finally, although the tax system usually favours debt financing, some changes in the tax system may alter economic incentives so as to increase firms' reliance on internal finance.

I.5. Implications for the recovery

Part of the recent rise in corporate NLB is probably cyclical ...

As documented at the beginning of this focus section, corporate NLB has surged in the euro area since the beginning of the global recession. Part of the increase is probably of a cyclical nature. The analysis of past episodes of balance sheet adjustment presented earlier shows that balance sheets respond to the business cycle. In the euro area, a cyclical pattern was clearly visible in NLB data during the downturn of the early 2000s and is likely to be repeated in the current business cycle. If the previous downturn is to be of any guidance, balance sheets could, however, be a relatively persistent source of cyclical pressures on aggregate demand: in the first half of the decade, corporate NLB reached its peak only 2.5 to 3 years after the beginning of the downturn and several quarters after the output gap began to close.

... but lasting balance sheet effects could weigh on the recovery

In addition to cyclical effects, there are also several reasons to worry about more protracted structural forces that could weigh on corporate balance sheets and aggregated demand in the euro area during the recovery. These include the existence of a debt overhang in the private sector, changes in risk attitudes and medium-term downside risks to potential growth. There is evidence that the euro-area corporate sector entered the global recession with a **debt overhang** that was both significant and higher than at the beginning of the previous downturn. According to estimates by Kok Sørensen et al. (2009), corporate debt was close to the level suggested by fundamentals in the early 2000s but about 15% above equilibrium on the eve of the global recession. ⁽¹⁸⁾

To the best of our knowledge, estimates of equilibrium credit levels are not available for individual Member States but in some of them, where booming credit in pre-crisis years has led to

⁽¹⁵⁾ See also Schumacher (2006), op. cit. Corporate NLB might increase more strongly following a negative shock in those countries where the average firm size is rather small.

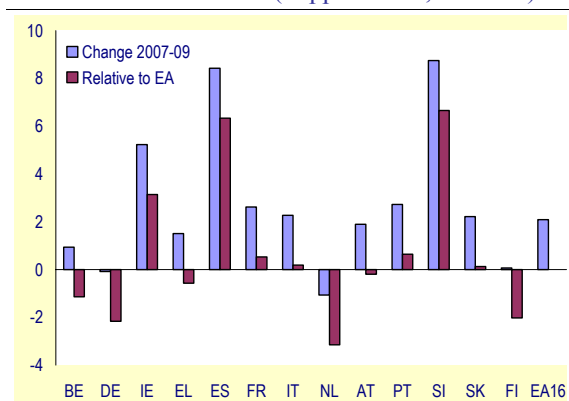
⁽¹⁶⁾ NLB in the non-financial corporate sector in Germany fell steeply in 2000, a year in which corporate tax payments were exceptionally high. Taxation already played an important role for NLB prior to the tax reform.

⁽¹⁷⁾ Deutsche Bundesbank, Monthly Report, August 2000, p. 61.

⁽¹⁸⁾ Kok Sørensen, C., D. Marqués Ibáñez and C. Rossi (2009), 'Modelling loans to non-financial corporations in the euro area', ECB Working Paper Series No 989 (January).

very high leverage, the overhang is in all likelihood considerably higher than for the euro area as a whole. In fact, during the current recession corporate NLB has increased much more strongly in some countries than in others (see Graph I.4). Especially Slovenia, Spain and Ireland experienced a corporate balance sheet adjustment far exceeding the euro-area average. At the same time, the adjustment was lower than the average in particular in the Netherlands, Germany and Finland.

Graph I.4: Changes in corporate NLB across euro-area countries (in pp of GDP, 2007-09)



Source: Commission services.

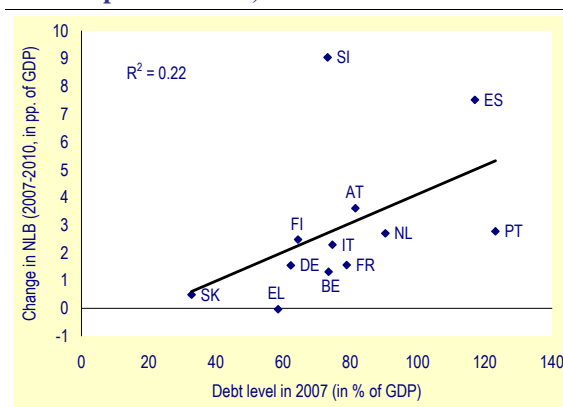
These differences are indicative of different adjustment needs across euro-area countries and corroborate the idea of the existence of pockets of excess indebtedness in the euro-area periphery.⁽¹⁹⁾ This can be further seen in Graph I.5. The financial crisis has generally triggered a much steeper rise in corporate NLB in the Member States which entered the recession with comparatively elevated levels of corporate debt. This is suggestive of the beginning of a debt consolidation process across the euro area which is unevenly distributed.

In addition to the correction of past debt excesses, the global crisis has triggered **changes in attitudes towards risks** that may also have a lasting impact on corporate balance sheets. The crisis will likely entail a general and lasting increase in risk premia that will push up the cost of capital. For corporations, this will entail an increase in the cost of external funds relative to internal funds and a strong incentive to rely more on self-finance. Furthermore, the change in risk attitudes is likely to be particularly potent in the

⁽¹⁹⁾ See also: European Commission (2010), ‘Surveillance of intra-euro area competitiveness and imbalances’, European Economy 1/2010.

case of bank lending as both banks and their customers become more aware of the risks associated with their lending and borrowing activity. Changes in bank lending practices could have a particularly strong impact on small and medium-sized companies, for which banks constitute the only source of external funding, leading to lasting deleveraging pressures in that sector.

Graph I.5: Debt levels and changes in NLB in the corporate sector, euro-area Member States



Source: Commission services.

Finally, unless appropriate policies are put in place, the crisis could have a **negative legacy for the production potential** via its impact on the accumulation of capital and knowledge, as well as hysteresis effects on the labour market.⁽²⁰⁾ The econometric work presented in this focus section has identified a strong relationship between growth (both cyclical and structural) and the probability of balance sheet adjustment episodes. Durable losses in production potential would therefore aggravate considerably the risks of a protracted phase of balance sheet adjustment in the euro area.

Policy implications and conclusion

The analysis presented in this focus section suggests that the euro area is facing a period of balance sheet adjustment in response to changes in risk attitudes brought by the crisis, a debt overhang, difficulties in the banking sector as well as weaker growth prospects. The evidence suggests that the adjustment could take several years and given the magnitude of the shock it is possible that several countries face up to a decade of balance sheet adjustment. In a world of

⁽²⁰⁾ See for instance: European Commission (2009), ‘The impact of the crisis on potential growth’, Quarterly Report on the Euro Area, Vol. 8(2).

I. Balance sheet adjustment in the corporate sector

imperfect capital markets, such an adjustment may have a protracted effect on aggregate demand – in particular in some countries – as companies strive to curb costs and investment. The negative consequences on macroeconomic demand could be magnified if the appropriate policies are not put in place. In particular, action would be needed in three areas.

First, and as advocated repeatedly by the European Commission in the past year, fixing the banking sector is essential to lay solid foundations for a sustainable recovery. As shown by the Japanese experience, persistent weakness in the balance sheets of the financial sector has a counterpart in the non-financial corporate sector, where it can aggravate balance sheet adjustment processes and their negative macroeconomic effects.

Second, it is important to put in place the policy required to mitigate the impact of the crisis on potential growth. This is needed because losses in output potential have clear welfare implications for households but also because a downshift in potential growth is likely to be associated with a protracted phase of retrenchment in aggregate demand due to corporate balance sheet consolidation. The frontloading initiative under the Europe 2020 strategy is critical in this respect as it calls for urgent implementation of significant reform measures that contribute to growth within a two to three year period. Measures that should

be considered in that context include those that support the ongoing reform of the financial sector, those that positively and rapidly impact on confidence but also structural reforms in the labour and product markets whose effects start to be felt in the short to medium term (say after some 2 years). The full and, where possible early, implementation of Community legislation (e.g. services directive, opening up of energy markets) could also contribute to support growth.

Third, policies that would ease the ongoing balance sheet process would also help to shore up the recovery. Further work is needed to identify practical policy instruments but several broad areas for policy intervention can be identified. Given that banking crises tend to weigh particularly on smaller companies, for which bank lending is the main source of external funds, measures aimed at facilitating access to equity markets by SMEs would be useful. As shown by the analysis of the past German experience, limiting the negative consequences of balance sheet adjustment on growth may also require acting on those structural features of the economy that restrict companies' access to capital markets. These may include elements of the tax system that favour financial investment by corporations, as seems to have been the case in Germany since the late 1990s. Features of the corporate governance system that hinder the use of external capital (e.g. because of corporate control considerations) could also be examined.