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Policy Analysis

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Assets and liabilities of Dutch non-financial firms

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and the Ministry of Finance*



CPB Notitie

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1 Introduction

The main purpose of this document is to analyse financial fragilities in Dutch non-financial firms, and in particular, to address policy concerns from different ministries (i.e. Economic affairs, Social affairs and employment, Finance). After consultations with these ministries, two main research questions were determined:

1. Are there financial fragilities in Dutch non-financial firms?
2. If so, in which particular type of firms?

The first question is complemented by the request for a broad overview on the balance sheet position of Dutch NFCs. The main concern is that the debt-to-GDP levels of non-financial firms are relatively high in the Netherlands and have been rising in the last years: from 106% in 2008 to 117% in 2015.¹

The second question relates to the need to look beyond averages and account for the heterogeneity of Dutch firms –with respect to size, economic activity and performance– and their particular financial situation. For instance, there are specific concerns regarding the financial situation of small Dutch firms: they face low credit supply growth (CPB, 2016) and a high percentage of loan rejections (Bezemer and Muysken, 2015; ECB, 2016), and significant higher interest rates for successful loan applications (Gelauff et al., 2014). Moreover, the fragile position for the smallest of SMEs (micro-firms) has been already confirmed by previous CPB studies (CPB, 2014; Van Veldhuizen and Van Beers, 2014).

On the other hand, the Netherlands has a sizeable current account surplus that is driven by the increase of net foreign assets by non-financial firms (cf. Jansen and Rojas-Romagosa, 2015; Rojas-Romagosa and Van der Horst, 2015). This points to a

¹ Source: StatLine database, CBS Statistics Netherlands.

strong financial position by Dutch firms that seems to contradict the increase in debt-to-GDP levels and the financial concerns regarding small firms.

Therefore, to assess the financial situation of Dutch firms and analyse these contradictory results requires an integrated approach where we analyse both firms' assets and liabilities, and firm heterogeneity. In particular, we combine the equity, assets and liabilities of firms, and look at different dimensions of the firms: size (small, medium, large), performance by quartile, and sectoral data. We use a set of financial indicators and the Dutch averages (by dimension) to compare its performance with respect to other EU-countries as a benchmark. Moreover, we look at average performance but also at firm heterogeneity and we try to identify which firm-types are vulnerable (by size, sector and performance level).

This analysis builds on previous CPB work (Jansen and Ligthart, 2014; CPB, 2014), and we employ two firm-level databases (BACH and Amadeus²) to analyse the financial position of Dutch firms using a combination of different financial indicators. We construct and analyse four different financial indicators (debt ratios, solvency, liquidity and profitability) using the BACH and Amadeus firm-level databases. The BACH database compiles and harmonises firm-level databases for different EU countries and allows for international comparisons of different financial indicators by economic sectors and firm-size. However, the BACH database only provides aggregated indicators (mean and quartile data) and it is not possible to access the underlying firm-level data. Therefore, we complement the analysis by using the Amadeus database, for which we can work directly with the firm-level data.³

2 Background and review of previous studies

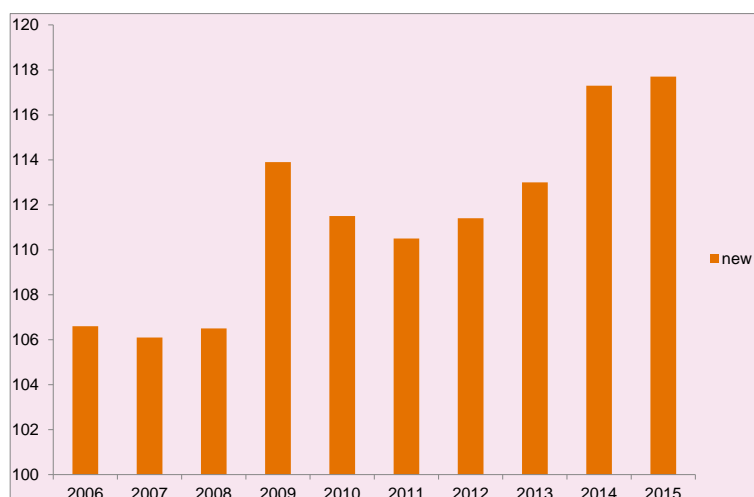
In this section we present the economic background regarding the financial performance of Dutch firms, its relation with the large Dutch current account surplus and the indicators that point to financial concerns regarding small Dutch firms. Here we also include the results of previous studies and how they relate to our research questions.

The debt-to-GDP ratio for Dutch non-financial firms (see figure 2.1) has been steadily increasing after the 2008 Financial Crisis and reached a relatively high level of 117% in 2015.

² The data from Amadeus database is downloaded from Erasmus Data Service Centre (EDSC) at Erasmus Universiteit Rotterdam (EUR). Kan Ji, one of the authors of this document, has a hospitality agreement with EUR, which gives her right of access to the scientific facilities at EUR.

³ On the other hand, the Amadeus database is not harmonised between countries and therefore, requires a series of cleaning procedures to standardise the construction of the indicators to keep the country-specific results comparable. See the Appendix for details.

Figure 2.1 Netherlands: non-financial firms debt to GDP ratios, in percentages



Source: CBS Statistics Netherlands.

However, this indicator is not very informative to assess the financial position of firms. In particular, GDP is a flow variable of the value-added generated by the economy each year, and as such, it consists mainly of wages received by workers (around 50% of total GDP in the Netherlands), profits (i.e. gross operating surplus of around 40%), plus indirect taxes minus subsidies (10%). Thus, only a fraction of each year's GDP is directly related to firm's profits. Therefore, using GDP changes as a firm-level benchmark is a very indirect indicator of the financial situation of non-financial firms, since it only has an indirect effect on firm's balance sheets.⁴

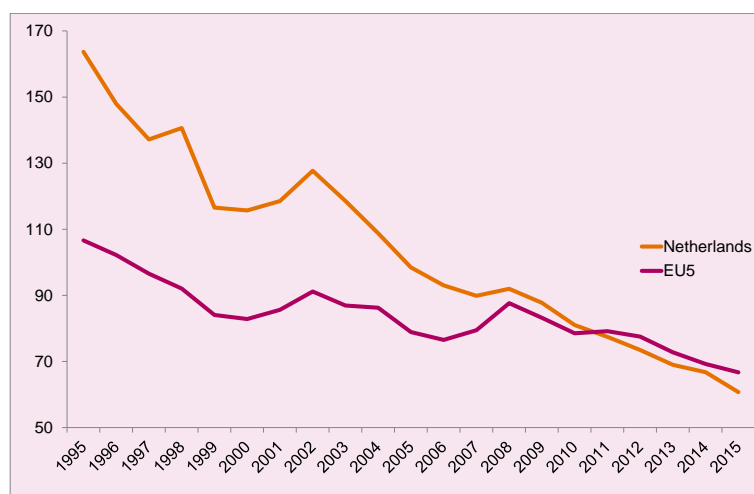
For instance, when we employ Eurostat data to estimate debt ratios for Dutch non-financial firms –defined as debt to financial assets ratios– we observe that although the debt ratios were extremely high in the mid-1990, they have been steadily decreasing in the last years(see figure 2.2).⁵ In addition, when compared with other EU countries,⁶ they are at similar levels by 2010 and around five percentage points less in 2015. This data, although not exactly comparable to our debt ratios estimated below (see section 4.7), point to the same conclusions: in the last years Dutch debt levels have been decreasing and are below the EU5 average values.

⁴ On the other hand, the share of total private debt –including household and non-financial firms– with respect to GDP is a more informative indicator, since around 90% of GDP is income received jointly by households and firms.

⁵ On the other hand, this combination of increasing debt-to-GDP and decreasing debt-to-asset ratios, points to an increase in the assets-to-GDP ratio. This increase in the balance sheet size or "financialisation" is considered by some authors to entail financial risks of their own (see for example, Bezemer and Muysken, 2015).

⁶ The EU5 group comprises Austria, Belgium, Germany, France and Spain. As explained below, we chose this group as a comparison benchmark for the Netherlands due to data availability and country characteristics.

Figure 2.2 Netherlands and EU5, non-financial firms, debt to financial assets ratios, in percentages



Notes: Debt is defined here as debt securities plus loans. Source: Eurostat.

This is also in line with the results in Jansen and Ligthart (2014). They found that the financial position of Dutch NFCs has improved in the period between 1995 and 2012.⁷ There has been a reduction in the debt-to-GDP ratio (from around 140% in 2000 to around 115% in 2012) coupled with a relatively low debt-equity ratio (85%), compared with a 95% ratio for the core-EU countries. These figures put Dutch firms in a relatively better financial position than the core-Eurozone and other EU countries. Moreover, this financial situation reflects steady profits with increased retained earnings that have financed increased foreign investments and larger liquidity holdings.⁸

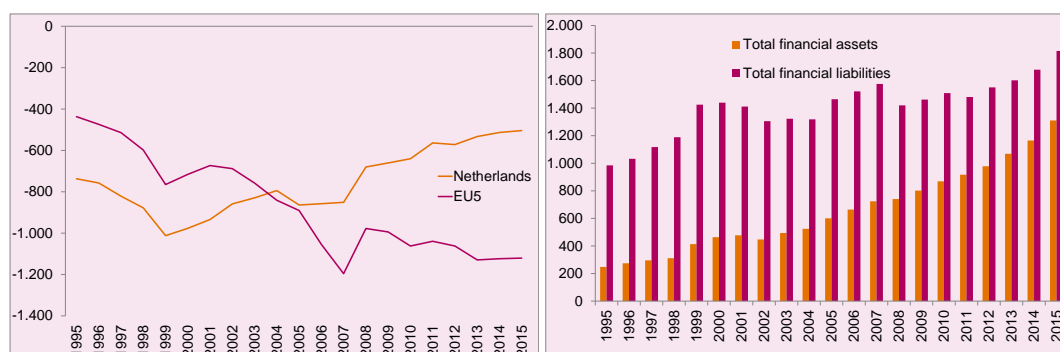
As explained above, another interesting fact is that the large and persistent Dutch current account (CA) surplus is driven mainly by the net international savings (i.e. net foreign lending) by Dutch non-financial firms (Jansen and Rojas-Romagosa, 2015; Rojas-Romagosa and Van der Horst, 2015). The current account reflects flows (changes in net foreign assets) but given that the Dutch CA surplus has been consistently high for many years, these asset flow changes will also affect the stocks. Figure 2.3 shows that the net-asset position (i.e. financial assets minus financial liabilities or net financial assets) of Dutch non-financial firms has improved significantly in the last two decades, with an increase of around 500 billion euro. This corresponds to a change in the ratio of net financial assets to GDP from around -250% in 1999 to -75% in 2015. While the level of financial liabilities has been kept at a high level, financial assets have been steadily increasing (see right-hand side graph

⁷ They used CBS national account data of the balance sheet of (aggregated) non-financial corporations (NFCs) from 1990 to 2012. They complemented this data with aggregate SFGO/SFKO data to decompose NFCs into firm-size categories: large MNEs, large non-internationals and SMEs. Furthermore, they used EuroStat national accounts balance sheet data to construct a 'core-EU' group: Belgium, Germany, France and Italy, which is used as a reference to compare Dutch NFCs internationally.

⁸ This is also reflected in a higher current account surplus, which we discuss below.

in figure 2.3). In contrast, the net financial assets of the EU5 has been decreasing –but on relative terms (i.e. with respect to GDP) it is very close to zero.

Figure 2.3 Netherlands, net financial assets of non-financial firms compared with EU5 (left) and total financial assets and liabilities (right), in billion euros



Notes: EU5 is the simple average of Austria, Belgium, France, Germany and Spain. Source: Eurostat.

This steady rise in financial assets is very significant and it is possibly related to the current account surplus. This is also reflected in the strong correlation between the net-lending of non-financial firms and the CA surplus. The data available, however, makes it difficult to establish a direct one-to-one relationship. For instance, the current account is driven by changes in foreign assets (financial and non-financial), but Figure 3 only relates to changes in total financial assets (which include domestic assets), but does not include non-financial assets. Moreover, the contribution of non-financial firms to the Dutch CA surplus is driven mainly by multinational enterprises (Jansen and Ligthart, 2014), which represent a very small share of total Dutch firms (see Table 2 below). Therefore, the changes in total financial assets might be overlooking significant firm-type heterogeneity.

The Netherlands is characterised by a relatively large share of MNEs –including both Dutch firms and foreign corporations headquartered in the Netherlands– with respect to other comparable countries. Jansen and Ligthart (2014) found striking differences between balance sheet indicators by firm size. Debt ratios are significantly higher for MNEs and other large firms (between 300 to 400% as percentage of gross value added), than for small firms (around 100%), which is determined by external financing possibilities. These debt ratios have remained relatively stable, with only MNEs ratios increasing significantly. Solvency ratios (defined as own equity to total assets) are also higher for small firms, but have been steadily decreasing, while solvency ratios for MNEs are 20 p.p. higher than for other large firms and have been increasing. The share of liquid assets to value added has been steadily increasing over the period, albeit some variability, in the whole period for all firms. Jansen and Ligthart (2014) conclude that the international financial position of Dutch firms is heavily influenced by MNEs and their particular activities related to FDI, subsidiary profits, and retained earnings.

On the other hand, the financial position of small firms seems to be less solid. The study by CPB (2014) had a deeper look into the financial position of SMEs using detailed micro-data from CBS (NFO and ABR). SMEs are further divided into micro, small and medium firms. They construct a series of financial indicators: Solvency, returns on assets, revenue growth, and the current ratio (as a measure of liquidity). In general, solvency ratios are lower than in the macro data (around 40%), but have been instead rising between 2000 and 2012, while the financial position of micro-firms is more fragile than for other SMEs.

There are other problematic financial aspects for SMEs. In particular, loan application rejection rates by Dutch SMEs are double as high (30%) as those in other Eurozone countries (Bezemer and Muysken, 2015), while SMEs that successfully obtain a loan pay significantly higher interest rates (Gelauff et al., 2014). In addition, very small (micro) firms have suffered the most after the crisis, with low solvency and return to capital ratios, when compared with other SMEs (Van Veldhuizen and Van Beers, 2014).

To sum up the literature, the average Dutch firm has relatively healthy finances, also when compared with other Eurozone firms. But firm heterogeneity is important: SMEs have a less solid financial position than large firms and MNEs.

3 Overview of the firm-level databases

In this section we describe the two databases that we use for our financial analysis: BACH and Amadeus.

3.1 BACH database

Adding to the previous research on the financial stability of the Dutch non-financial sector, we look deeper into the financial situation of the Dutch firms by analysing the distribution of the financial indicators. The BACH database provides data on the quartiles of the distribution of the various financial ratios and the financial situation of the firms by sector. In order to analyse the financial situation of Dutch firms with respect to other similar countries, we compare the Dutch firms' financial data with the financial data of firms in five EU and Eurozone countries: Austria, Belgium, France, Germany and Spain.⁹ To obtain a broad view on the financial situation of firms, moreover, we analyse four financial indicators: debt ratios, solvency, liquidity and profitability (see Section 4.1 for details).

⁹ These countries were selected because of data availability and comparability with the Netherlands. In particular, within the European Union, they represent countries with a similar financial development and country characteristics to the Netherlands.

We use aggregated data from BACH database that contains the balance sheets, income statement, some financial, technical and profitability indicators. The BACH database has some differences from the non-financial sector firms data provided by the CBS.¹⁰ Firstly, BACH is based on the unconsolidated data while CBS uses consolidated data.¹¹ Also, the number of Dutch firms included in the BACH database is a bit smaller than the number of Dutch firms in the CBS database (table 3.1). The data in BACH –as well as the CBS data– is also disaggregated by the size of the firm and by economic activity (see Section 3.3 below).

The historical data is limited and the data for the Netherlands in BACH starts in 2008. Therefore we use 2008-2014 data for the analysis. Finally, the BACH database provides data not only on the weighted mean but also on the 1st, 2nd and 3rd quartiles (i.e. percentile 25, percentile 50 and percentile 75), so we can get some information about the distribution of the non-financial firms by the financial indicators.

3.2 Amadeus database

Amadeus is a European subset of ORBIS database, which is compiled by Bureau van Dijk Electronic Publishing, BvD. Several unique features make Amadeus suitable for our research purposes. First, Amadeus provides comprehensive information on financials, stock prices, ownership, and subsidiaries for 19 million firms across 34 European countries. Second, it retained firm’s information for a rolling period of 8 years (and for the Netherlands, the data can be traced back to 1993). Finally, the firm-level data allows us to analyse firm-level heterogeneity and the distribution of financial indicators for different firm types.

We retrieve information from Amadeus so as to be comparable with BACH database in terms of sample period, sample group and financial indicators. As the data for the Netherlands in BACH starts in 2008, we also use 2008-2014 data in Amadeus.¹² Accordingly, we also compare Dutch firms with the same five European countries (Austria, Belgium, Germany, Spain, France) as before.

Table 3.1 Total number of Dutch firms by database

Database:	2008	2009	2010	2011	2012	2013	2014
BACH	191,645	204,287	227,192	234,106	244,961	270,389	261,572
CBS				270,241	279,293	289,665	300,089
Amadeus	156,454	201,075	213,293	227,788	240,280	251,732	257,217

¹⁰ http://opendata.cbs.nl/dataportaal/portal.html?_la=nl_catalog=CBS_tableId=81837NED_theme=56

¹¹ Consolidated data aggregates individual firms under a same firm conglomerate and/or group to create one balance sheet for the whole group. If different individual firms in the group have divergent balance sheet situations, the differences between the consolidated and unconsolidated data will be most pronounced.

¹² See Appendix for details on the downloading and cleaning procedures required.

An important limitation from both the BACH and Amadeus databases is that they are not representative of the full sample of Dutch (or other countries') firms.¹³ To analyse how this issue may affect our results, in section 4.7 we compare our results to those constructed by Eurostat using a representative sample of firms.

3.3 Firm size classification

The firm size classification follows the European Commission guidelines (cf. European Commission, 2015). Table 3.2 provides the classification thresholds.

Table 3.2 European Commission firm-size classification thresholds

	Number of employees	<i>AND</i>	Annual turnover	<i>OR</i>	Annual total assets
Large	≥ 250		> 50 million euro		> 43 million euro
Medium	<250		≤ 50 million euro		≤ 43 million euro
Small	<50		≤ 10 million euro		≤ 10 million euro
Micro	<10		≤ 2 million euro		≤ 2 million euro

Notes: Firm classification is based on the number of employees and one of the other criteria: either turnover or total assets (i.e. balance sheet total). European Commission (2015). The BACH database classifies firms using the annual turnover criteria, while the Amadeus database (as well as CBS) use the annual balance sheet total (i.e. total assets).

In table 4.1 we provide the distribution of the Dutch firms in BACH database by firm size category. In the CBS non-financial sector firms database large firms are considered the firms with the total assets value higher than 40 million euro. Another disaggregation is possible by the activity using NACE classification.

¹³ In other words, we do not have the sample expansion factors that can be used to extrapolate the data from individual firms to the national levels used in national accounts.

4 Financial analysis of Dutch firms

In this section we first define the financial indicators that we use, then we present the overall financial situation of all non-financial firms and then three different classifications: by firm size (e.g. small, medium and large), by indicator performance (using the quartile data by indicator) and by economic sector.

4.1 Financial indicator definitions

To assess the financial situation of Dutch firms we employ four financial indicators, which can be all calculated using the BACH database:

1. Debt-to-assets ratio = (total debt / total assets) *100
2. Solvency = (equity / total assets)*100
3. Liquidity = (liquid assets / total assets)*100
4. Profitability = (net profits / equity)*100

Table 4.1 Number of the Dutch firms in each database by firm size

	2008	2009	2010	2011	2012	2013	2014
BACH:							
Small firms	186,596	199,796	222,605	229,074	239,955	265,028	256,356
Medium firms	4,263	3,804	3,853	4,222	4,184	4,429	4,353
Large firms	786	687	734	810	822	932	863
CBS:							
SMEs				268,351	277,402	287,797	298,087
Large firms				1,890	1,891	1,868	2,002
Amadeus:							
Small firms	152,437	195,790	207,649	221,397	233,510	244,582	249,776
Medium firms	3,120	3,983	4,263	4,759	4,978	5,222	5,440
Large firms	897	1,302	1,381	1,632	1,792	1,928	2,001

The BACH database provides indicators for short-term debt and long-term debt.¹⁴ We sum both terms to estimate the debt-to-assets ratio.¹⁵ Note that this debt ratio will be close (but not equal) to one minus the solvency ratio. This is because there are non-debt items in firms' balance sheet liabilities (e.g. other accounts payable).

Liquid assets in BACH include the amount available in cash, demand deposits and other deposits in financial institutions plus financial assets held for trading and

¹⁴ Short term debt (up to one year) includes: bonds, and other debt securities issued, debt to financial institutions, other debt and accounts payable, and all trade payables and payments received on account of orders. Long-term debt (more than 1 year, non-current) includes: bonds, and other debt securities issued, debt to financial institutions, other debt and accounts payable.

¹⁵ This also means that we do not have quartile data for total debt ratios, but only for the short and long-term debt ratios that are directly provided by the BACH database.

derivatives, that are very small. For the profitability indicator we use the net profit or loss for the period (after taxes) provided by BACH.

Using the Amadeus database we can calculate the first three financial indicators, but we cannot analyse the profitability indicators. This is because the Amadeus database has limited observations on the income statement and thus, few data on firms' returns.

The definitions of the indicators using the Amadeus database are:

1. Debt-to-assets ratio= $[(\text{current liabilities} + \text{non-current liabilities}) / \text{total assets}] * 100$
2. Solvency ratio= $(\text{Shareholders funds} / \text{Total assets}) * 100$
3. Liquidity ratio= $[(\text{cash and cash equivalent}) / \text{Total assets}] * 100$

Note that the debt ratio from Amadeus is very close but not exactly the same as the debt ratio from the BACH database. The solvency ratio is directly available from Amadeus, and 'shareholders funds' corresponds to equity. The other two ratios we need to calculate on our own. According to the correspondence table in Amadeus, "cash and cash equivalent" refers to liquidity assets (in Dutch: Liquide middelen).

4.2 Overall results with full sample

Figure 4.1 shows our four indicators when all firms are considered. From this figure we can observe that the overall financial situation of Dutch firms is positive, and favourably compared with other EU countries. Debt ratios are decreasing, and below the EU5 average. Solvency indicators are increasing and significantly higher than the EU5 average. Liquidity has also been increasing and profitability is up in 2014 after several years decreasing in the Netherlands, but with overall higher values than the EU5 in the whole period.¹⁶ Finally, the only indicator that is below the EU5 average is the liquidity indicator calculated from the Amadeus database.

¹⁶ Because we use a definition of debt-to-assets ratio, that is not calculated by the BACH Database, then we only have information on the debt ratio mean, but not on the median (nor on the quartile data).

Figure 4.1 Netherlands and EU5, main indicators for all firms, in percentages

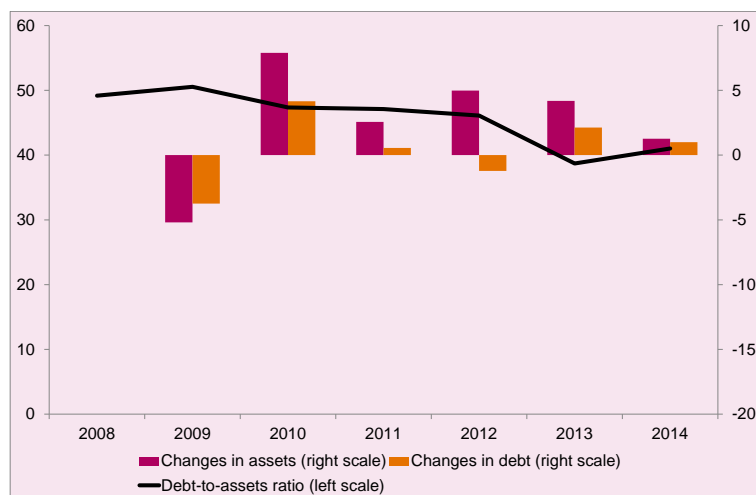


Notes: EU5 is the simple average for Austria, Belgium, France, Spain and Germany. Debt-ratios are given in weighted means, the other three indicators use median values. Source: Own estimations using the BACH and Amadeus databases.

Regarding the composition of the debt ratio, figure 4.2 presents the decomposition of the debt ratio between changes in assets and debt.¹⁷ We observe that in 2010-2014 both debt and assets were increasing, but assets were increasing faster causing a decrease in the debt-to-assets ratio. When looking at the Amadeus data the Netherlands has higher debt levels than with the BACH data although well below the EU5 average. The different indicator levels between databases can be explained by different definitions, data collection and firm samples. Even though these differences are common for different indicators and classifications, both data sets convey a very similar message.

¹⁷ Some changes in the debt-to-assets are also due to a change in the sample of firms

Figure 4.2 Netherlands: Debt to GDP ratios and changes in debt and assets, in percentages (different scales)



Source: Own construction using BACH database.

From figure 4.2 we also see that the average solvency in the Netherlands is relatively high and increasing between 2008 and 2014.¹⁸ In general, banks consider that a solvency indicator above 40% is healthy (cf. CPB, 2014) and Dutch firms (on aggregate) are well above this benchmark. Another indicator that is important in assessing the financial situation of the Dutch firms is the liquidity indicator (liquid assets-to-total assets), from figure 4.2 we observe that the Dutch firms are relatively liquid, with liquidity ratios around five percentage points higher than for the EU5 average. In addition, the indicator levels are very similar for both databases. Note that even though the debt and solvency ratios are closely related indicators, in figure 4.2 the debt ratio is given in weighted mean values and the solvency ratio as the median value.

Using the BACH database we see in figure 4.2 that the Dutch firms are significantly more liquid than the EU5 average (around five percentage points higher). High liquidity reduces the risk that the firm may have trouble in financing its activities. However, with Amadeus data liquidity in the EU5 is very similar to that in the Netherlands, and even higher for some years. In both cases, the indicator has been improving slowly over the period.

To analyse profitability we use the return-to-equity indicator.¹⁹ The Dutch firms profitability has been declining since 2008 with a sharp recovery in high 2014. Even though this decline, profitability has been above the EU5 average.²⁰

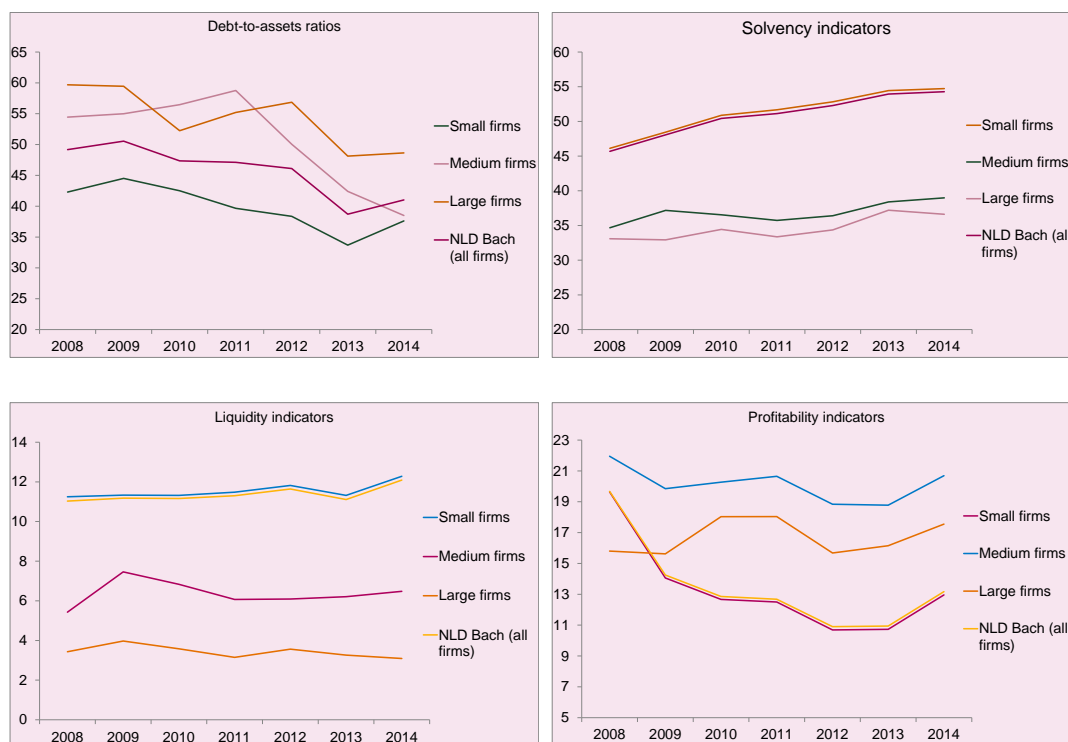
¹⁸ The study by Braaksma et al. (2014) finds lower solvency ratios – of around 10 points lower than our study. The differences in the results can be explained by the sample selection. Braaksma et al. (2014) only analyse firms with two or more employees, while we use the full firm sample. This allows us to analyse all firms and compare their financial situation with other European countries.

¹⁹ We also used the return-to-turnover indicator as another profitability indicator. However, the results with this indicator were very similar than the results we obtained with the return-to-equity indicator.

4.3 Results by firm size

When we look at our financial indicators by firm size, we first observe that there are significant differences for each type of firm. Debt ratios are significantly lower for small firms, and higher for larger firms, while in recent years the debt ratio of median firms has decreased from levels close to the large firms to the lower debt levels of the small firms (see figure 4.3 upper left corner). When we look at the other indicators we observe similar disparities between different firm types. Note that we use median value for the other three indicators (solvency, liquidity and profitability), so the small firms –being by far the largest number of firms in the sample (see table 4.1) have values very close to the median. The medium and large firms have significantly lower solvency and liquidity levels, but much higher profitability levels. This points to clear heterogeneity between firm types. Figure 4.3 presents the results only using BACH database, but very similar results are obtained using the Amadeus database. Nevertheless, the positive financial outlook for Dutch firms also holds when we analyse the pattern of change of the indicators over time and we compare firm types with respect to other EU5 countries. In the following sections we analyse each firm type in turn.

Figure 4.3 Netherlands, main indicators by firm size, in percentages



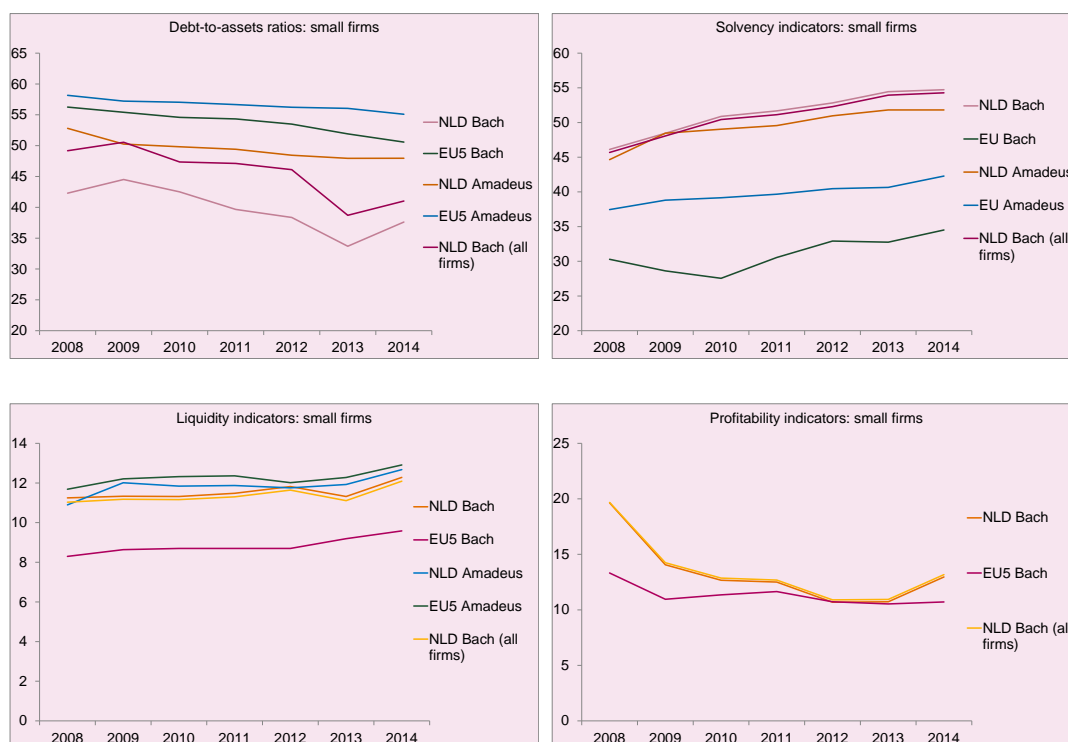
Notes: Debt ratios are in mean values, other three indicators are in median values. Source: Own estimations using the BACH database.

²⁰ Recall that the Amadeus database has very limited data on firms' income statements, so we could not construct a profitability indicator using these data.

4.3.1 Small firms

The financial indicators for small firms are presented in figure 4.4 Here we observe that –given the relatively high representation of small firms in the total sample– the median values for solvency, liquidity and profitability indicators are very close to the full sample values. However, the debt ratio –which uses the weighted mean of the sample, instead of the median, does show that small firms have a significantly lower debt level than the Dutch full sample (between 5 and 10 percentage points less) and an even lower debt ratios than the small firms in the EU5 (between 10 and 15 percentage points).

Figure 4.4 Netherlands and EU5, main indicators for small firms, in percentages



Notes: EU5 is the simple average for Austria, Belgium, France, Spain and Germany. Debt-ratios are given in weighted means, the other three indicators use median values. Source: Own estimations using the BACH and Amadeus databases.

Thus, compared to the other European countries Dutch firms have quite low debt level in general (see upper right corner in figure 4.1). This is strongly driven by the relatively low debt ratios by the small firms (see upper right corner in figure 4.4 and also, by the sharp decrease in the debt ratios of medium sized firms (see figure 4.5). From the BACH database, moreover, we know that most of the debt is short-term debt (more than half of the firms do not have long-term debt).

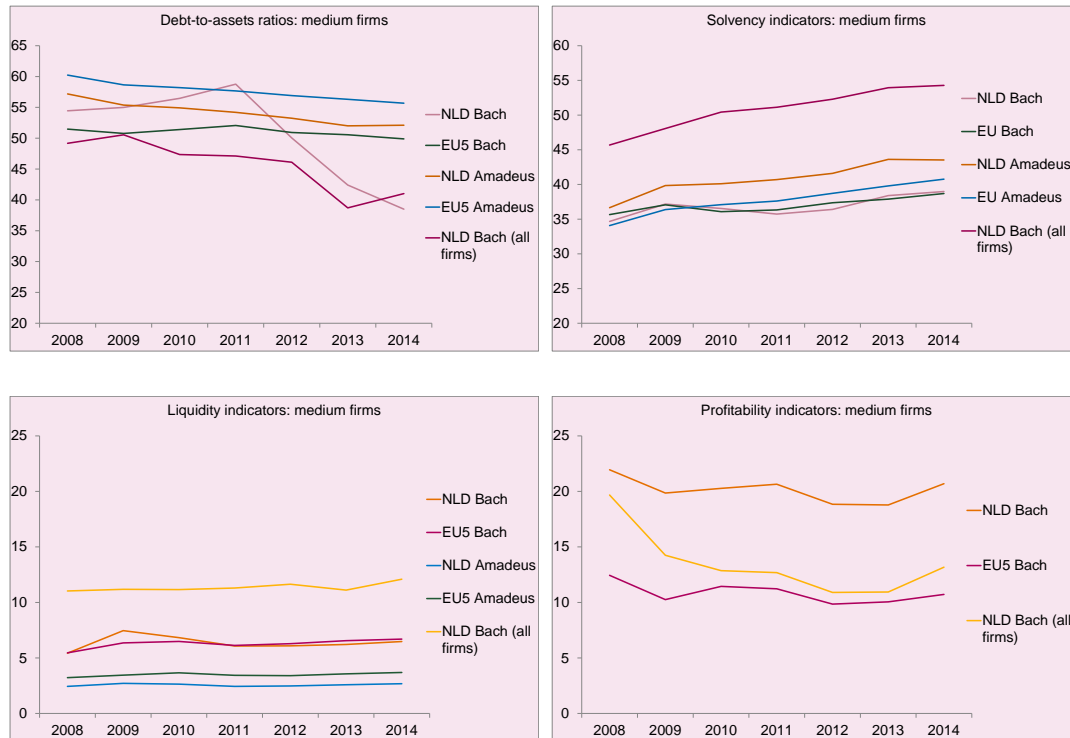
Using the Amadeus data we observe that debt ratios are higher (again) than with the BACH data, but still decreasing and below the EU5 average. The same applies with the solvency ratios of both databases. Once again, only the liquidity indicator using the

Amadeus database shows very similar values between the Netherlands and the EU5 average.

4.3.2 Medium and large firms

The financial indicators for medium-sized firms are presented in figures 4.5 and 4.6 respectively. Large and medium firms have in general higher debt levels, and lower solvency and liquidity indicators than small firms. In general, the median values for these larger firms are much closer to the EU5 average. Only the profitability indicator is significantly higher for Dutch medium and large firms, and also much higher than for the small Dutch firms.

Figure 4.5 Netherlands and EU5, main indicators for medium firms, in percentages



Notes: EU5 is the simple average for Austria, Belgium, France, Spain and Germany. Debt-ratios are given in weighted means, the other three indicators use median values. Source: Own estimations using the BACH and Amadeus databases.

Figure 4.6 Netherlands and EU5, main indicators for large firms, in percentages



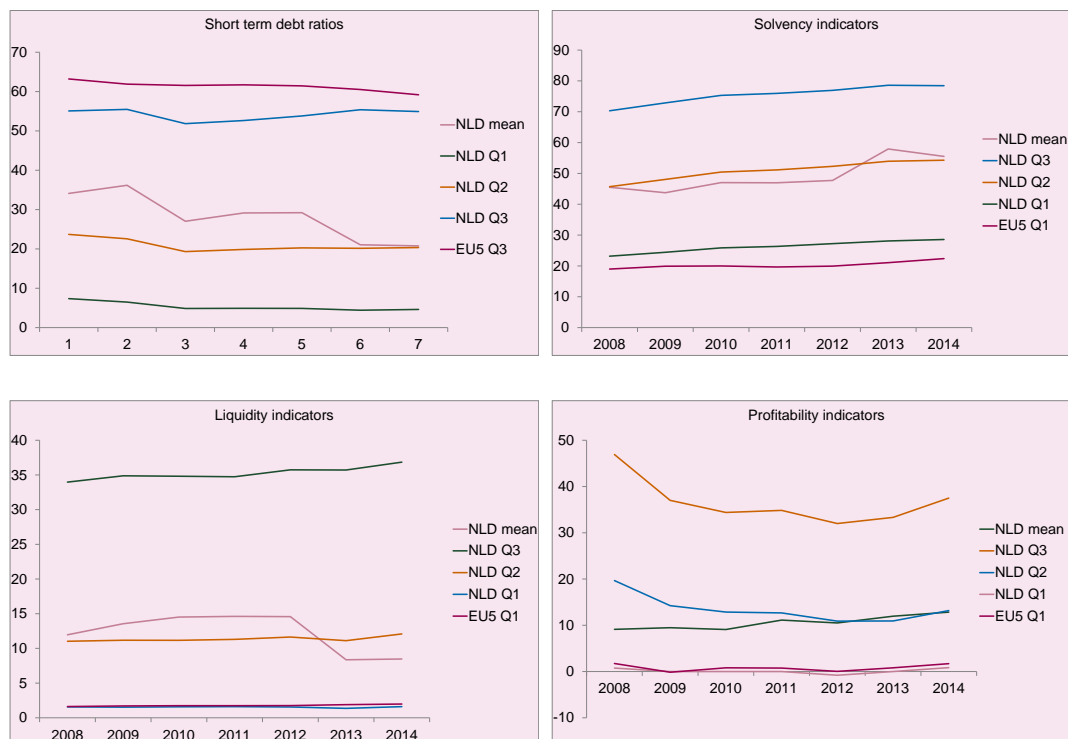
Notes: EU5 is the simple average for Austria, Belgium, France, Spain and Germany. Debt-ratios are given in weighted means, the other three indicators use median values. Source: Own estimations using the BACH and Amadeus databases.

4.4 Analysis by indicator performance

In this section, we use the BACH classification of indicator by quartile performance, which provides some information on the distribution of the individual firms' indicators within the total sample. figure 4.7 shows the quartile of Dutch firms with the highest value (NLD Q3), the median value (NLD Q2), the lowest value (NLD Q1) and the weighted mean (NLD mean). Note that depending on the indicator, Q3 will denote the quartile with the best performing firms for the solvency, liquidity and profitability indicator, while Q3 will represent the worst performing firms for the debt ratio. Finally, we include the average EU5 value for the worst performing quartile to compare it with the worst performing Dutch firms.

In general, we observe a wide variation in the performance of firms within indicators. For instance, the quartiles of the short-term debt distribution, show that the best performing Dutch firms (NLD Q1) have the short-term debt lower than 10%, while the worst performing Dutch firms (NLD Q3) have the short-term debt higher than 55%. However, these worst performing firms in the Netherlands still have debt level below the average for the worst performing firms in the EU5 (EU5 Q3).

Figure 4.7 Netherlands and EU5, main indicators by quartiles for all firms, in percentages

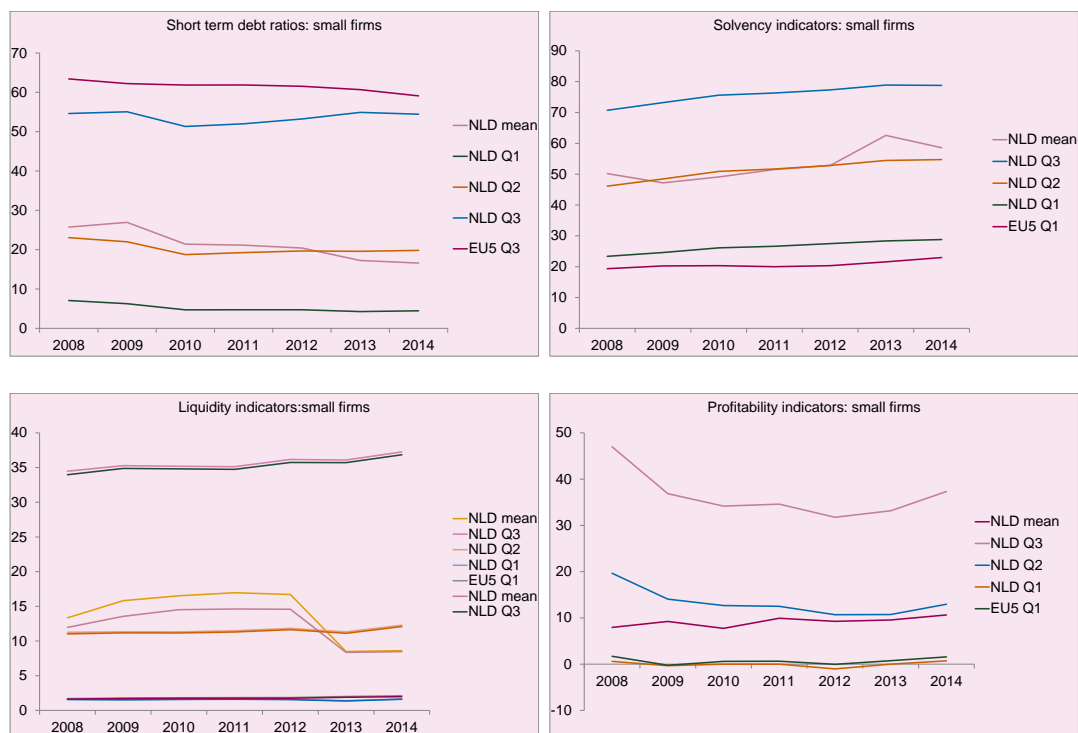


Notes: EU5 is the simple average for Austria, Belgium, France, Spain and Germany. Q1 is the first quartile (the worst performing firms for the solvency, liquidity and profitability indicators), Q2 is the median, and Q3 is the third quartile (the worst performing firms for the debt indicator). The BACH database provides quartile data for only short and long-term debt, not total debt. Source: Own estimations using the BACH database.

A similar conclusion can be drawn by analysing the solvency indicator, where here the worst performing Dutch firms (NLD Q1) have solvency levels around 50 percentage points below the best performing firms (NLD Q3), but still higher than the worst performing EU5 firms (EU5 Q1). However, note that there is a large number of firms (at least 25% of them) that are below the 40% solvency benchmark. The distribution of the liquidity and profitability ratios is somehow different. First, the best performing Dutch firms (NLD Q3) have indicators that are well above the median, with around three times higher values. However, the worst performing Dutch firms (NLD Q1) have liquidity and profitability levels that are the same or worse than for the EU5 average.

When we conduct the same quartile analysis, but only for small firms, we find a very similar pattern that for the full sample. Wide variation in the indicators, but still the worst performing small Dutch firms have lower debt ratios and higher solvency ratios than the worst performing EU5 firms, while the liquidity and profitability indicators are very similar for this particular group of firms (see figure 4.8)

Figure 4.8 Netherlands and EU5, main indicators by quartiles for small firms, in percentages



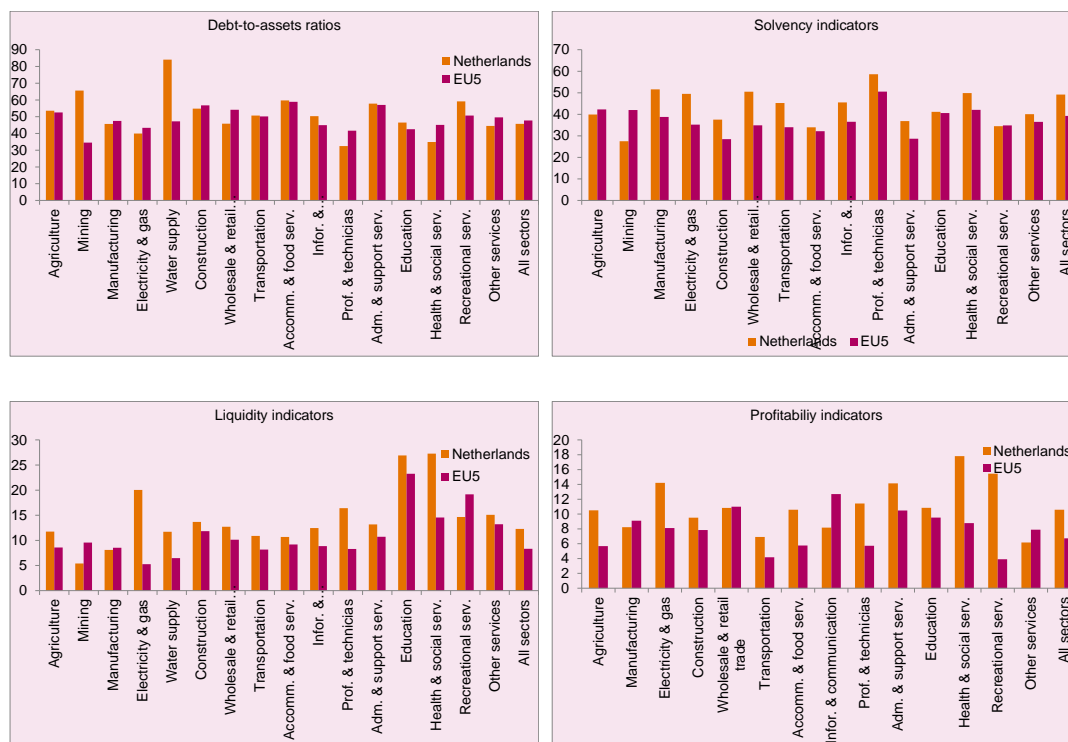
Notes: EU5 is the simple average for Austria, Belgium, France, Spain and Germany. Q1 is the first quartile (the worst performing firms for the solvency, liquidity and profitability indicators), Q2 is the median, and Q3 is the third quartile (the worst performing firms for the debt indicator). The BACH database provides quartile data for only short and long-term debt, not total debt. Source: Own estimations using the BACH database.

4.5 Analysis by economic sectors

Figure 4.9 shows the average by sector between 2008 and 2014 for all indicators for the Netherlands and the EU5. We find that the Dutch firms' debt in the main sectors is in line with the debt in the other countries. The level of debt is very dependent on the activity of the firm. We can see that the debt level in the water supply sector is rather high in the Netherlands, which is due to the exceptional increase in debt in 2011-2012. However, this is a rather small sector, so it has little impact on the whole debt level in the Netherlands.

Looking at the assets-to-equity ratios by sector and comparing them to the other countries shows that all sectors' solvency indicators are in line with the other countries' solvency indicators. Dutch companies' solvency in the large sectors is higher than the average solvency of the other 5 EU countries' firms. The only exception is the mining sector. However, in 2013-2014 the solvency of this sector increased (also the representation of the sector is better in 2013-2014, and this caused the average solvency in this sector to increase).

Figure 4.9 Netherlands and EU5, main indicators for all sectors, average values between 2008 and 2014, in percentages



Notes: EU5 is the simple average for Austria, Belgium, France, Spain and Germany. Debt-ratios are given in weighted means. The other indicators use median values. Source: Own estimations using the BACH- and Amadeus databases.

Sectoral liquidity comparison proves that the wide liquidity distribution is partly attributable to sectoral differences. When we look at the sectoral differences in liquidity, we can see that the main sectors firms in the Netherlands have higher or comparable liquidity level. The only exceptions are the mining and the recreational sectors, which are relatively small sectors in the Netherlands.

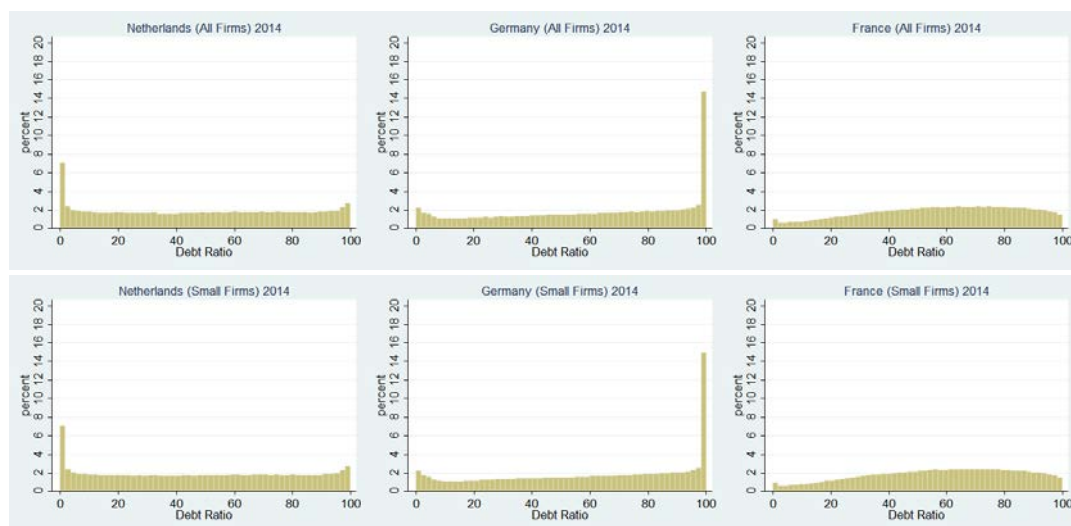
Looking at the sectoral averages for the profitability indicator, we can see that return-to-equity was higher or about the same as in the other five EU countries in all main sectors. The situation in the information and communication sector in the Netherlands looks worse than in the other countries, however low average profitability in this sector is due to a one-time negative return in 2012; in other years profitability was in line with the profitability level in other countries.

Also it is not likely that higher profitability and solvency is caused by the differences in the sectoral structure of the economy. Looking at the sectoral differences shows that in most sectors Dutch firms profitability is higher. This may be one of the factors causing higher solvency of the Dutch firms.

4.6 Histograms using Amadeus data

An advantage of using the Amadeus database is that we can calculate the financial indicators for each individual firm. This provides valuable information that complements the mean and quartile data used so far. Figure 4.10 shows the histograms for the debt ratios for three different countries and for the total sample of firms and the sub-sample of small firms.

Figure 4.10 Netherlands, Germany and France, histograms for debt ratios for all firms and small firms in 2014



Source: Own estimations using the Amadeus database.

The pattern present in figure 4.10 is very consistent over time and across firm types. For instance, in figures A.1 and A.2 in the Appendix we show the corresponding data for medium and large firms in 2014 and for the total and small firms sample in 2008.

The histogram information shows that a large number of firms might be in financial trouble, with debt ratios close to 100. On the other hand, this pattern seems to be normal over time and across countries. When comparing the firm distribution of debt ratios, the French and German data is slightly skewed to higher debt ratio values than for the Dutch firms.

However, it is unclear how a large proportion of firms can operate over time with relatively high debt ratios and why this is a common feature of the data, not only in the Netherlands but also in other EU countries. This is an issue that requires further investigation in the future.

4.7 Comparison with Eurostat financial indicators

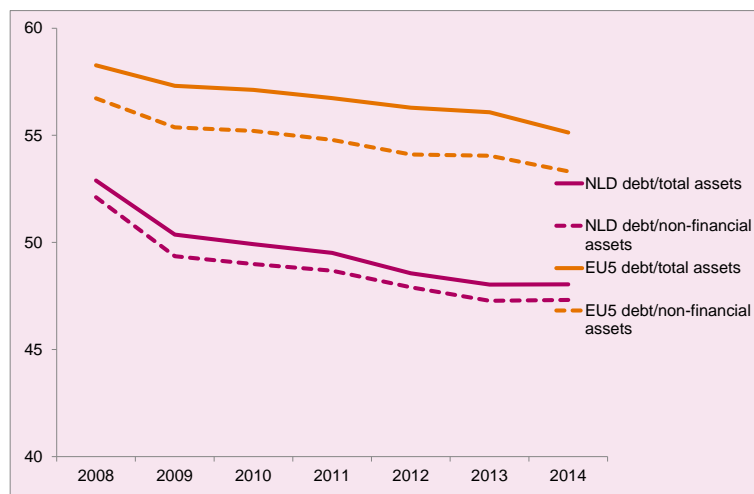
As explained before, the BACH and Amadeus databases are not representative of the full sample of firms in each country. Therefore, to assess how much this could affect our results, in this section we compare our results to the national accounts data from Eurostat, which are constructed using representative sample of firms.

The financial data collected by Eurostat also provides information on debt ratios, as already discussed in Section 2 and figure 2.2 although using total financial assets instead of total assets. The use of financial assets, instead of total assets, is an important difference between the definition of the debt ratios taken from Eurostat and the debt ratios we constructed using the BACH and Amadeus database. Figure 2.2, for instance, uses financial assets instead of total assets (i.e. financial and non-financial assets). Another potential difference may be sample size and representation,²¹ while the data we use is not consolidated –i.e. the balance sheets of firms that are part of a bigger conglomerate and/or are subsidiaries are not aggregated.

When we use the comparable debt ratios using non-financial assets as denominator from the Amadeus database (see figure 4.11 and compare to figure 2.2) we find that the debt levels are lower with the Amadeus database than using the Eurostat data, but the pattern is the same: decreasing debt ratios that are below the EU5 average. Note however, that the debt ratio using non-financial assets is higher – instead of lower – than using total assets, as should be expected. This inconsistency is due to different sample sizes when estimating each indicator. In particular, only around two-thirds of the Dutch firms in the Amadeus sample have data to distinguish non-financial assets from total assets, and therefore, the sample size for both ratios in figure 4.11 is different.

²¹ The BACH and Amadeus database do not provide expansion factors that can be used to extrapolate the samples to be representative of the full sample of firms in a country.

Figure 4.11 Netherlands and EU5, debt to financial and total assets ratios, in percentages



5 Conclusions

In this section, we summarise our results by providing answers to the research questions defined in the introduction.

To answer our first research question, we provided a comprehensive picture of Dutch firms' balance sheet characteristics over time, firm type/size, sectors and how they compare internationally. Our financial indicators analysis show that the Netherlands compares favourably with respect to other European countries in all four indicators, while the general trend has been for an improvement of each financial indicator over time. In particular, the comparison with the average EU5 groups shows that Dutch firms are in quite stable and relatively good financial situation: debt levels are relatively lower and solvency is relatively high – i.e. Dutch companies rely more on equity as a form of financing (equity is higher, debt is lower than in other countries). Therefore, although the debt of non-financial firms with respect to GDP increased after the global financial crisis, we find that the financial position of Dutch firms has improved significantly during this period.

To address the second research question we focused our analysis on small firms. However, here we also find that small Dutch firms are performing favourable with respect to the EU5 group and the overall level and trend of the indicators shows a healthy financial situation. Although the lowest quartile by indicator (i.e. financial performance) does show more fragile financial positions –as expected from the construction of the indicator– the comparison with respect to the EU5 is still positive. This favourable financial situation also extends to medium and large firms, and also to our sectoral analysis. Moreover, the financial position of the worst performing firms by indicator (first or third quartile) is also relatively good when compared to

the EU5 average. However, note that the positive financial situation of the average small firm does not extend to the micro-firms, which have been found in CPB (2014) to have a financial position that is more fragile than for other SMEs.

We find that the overall positive financial picture also fits with the general performance of Dutch non-financial firms with respect to the Dutch current account surplus. In particular, the increase in net international assets by non-financial firms is one of the main drivers of the current account surplus and this reflects a strong financial position by Dutch firms. However, as explained in Jansen and Ligthart (2014), this strong international financial position is mainly a consequence of the activities of MNEs and has little relation to the financial position of the (mostly) domestic medium and small firms.

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Appendix

Amadeus download procedures

Downloading data from Amadeus is a *nontrivial* issue. As mentioned before, Amadeus is a subset of the ORBIS database, and there are three ways to download Amadeus/ORBIS data:

- Through BvD's proprietary web platform available by the direct subscription
- Through BvD's historical vintages, where a vintage corresponds to the release date of the disk or the time of online access, respectively. These are available on historic CD-ROM disks.
- Through WRDS archives (only Amadeus available)

For our research, we used the last method to download the data. The raw data contains missing information for many firms, and may not be a national representative sample. The following is a list of possible reasons for these limitations: The ORBIS database for European regions has a wider coverage than Amadeus. Although Amadeus drops firms from the database if they did not report anything during the last five years while ORBIS keeps the information for these companies as long as companies are still in the business register.

There is a reporting lag of financial data of usually 2 years (it varies by country), and information is updated over time and some variables that were not available in early disks is made available in later vintages. All the access methods will cap the amount of information one can download in one run (the number of firms and the number of variables). This cap unfortunately translates into missing observations in the resulting download instead of termination of the download job. In particular, if researchers want to have full information on a set of variables (in our case to calculate debt ratio, we need information on total assets, current liabilities and non-current liabilities), then a single shot download from WRDS will deliver a bad firm size distribution. Therefore, it is generally recommended to use the second method to construct a national representative sample, and a researcher should use both ORBIS and Amadeus and several vintages from both databases in order to maximise data coverage. However, despite the limitations with the Amadeus database, we still use it due to time limitations. ²²

²² After downloading raw data, merging different vintages and cleaning, some authors estimate how much of the official gross output data from EuroStat is covered by the firms in their data for the total economy. With the exception of Germany, UK, Ireland, and the Netherlands, their data can account more than 50 percent of the aggregate output in all countries and around 80-90 percent in most countries.

Amadeus data cleaning procedures

After downloading the raw data from Amadeus, we apply the following cleaning procedures to the raw data²³:

- We exclude firms from the financial sector (sector K) and public firms (sector O).
- Drop duplicates in terms of BvD ID number and account closing year.
- Drop company-years with missing information on total assets and operating revenue and sales and employment (simultaneously).
- Drop the entire company (all years) if total assets are negative in any year.
- Drop the entire company if employment (in persons) is negative or larger than 2 million in any year.
- Drop the entire company if sales are negative in any year.
- Drop the entire company if tangible fixed assets (such as buildings, machinery, etc.) are negative in any year
- Drop if total assets are not equal to total share holders funds plus liabilities.
- Keep only active firms.
- Keep the firms which have unconsolidated account reporting.
- Drop if equity (shareholders funds) is negative.
- Drop if total liabilities are negative.

Table 3.1 shows the total sample size for the Netherlands over the period 2008 to 2014 after these cleaning procedures.

²³ Our cleaning procedures follow Kalemli-Ozcan S., B. Sorensen, C. Villegas-Sanchez, V. Volosovych, S. Yesiltas, "How to Construct Nationally Representative Firm Level data from the ORBIS Global Database", NBER working paper (21558), 2015.

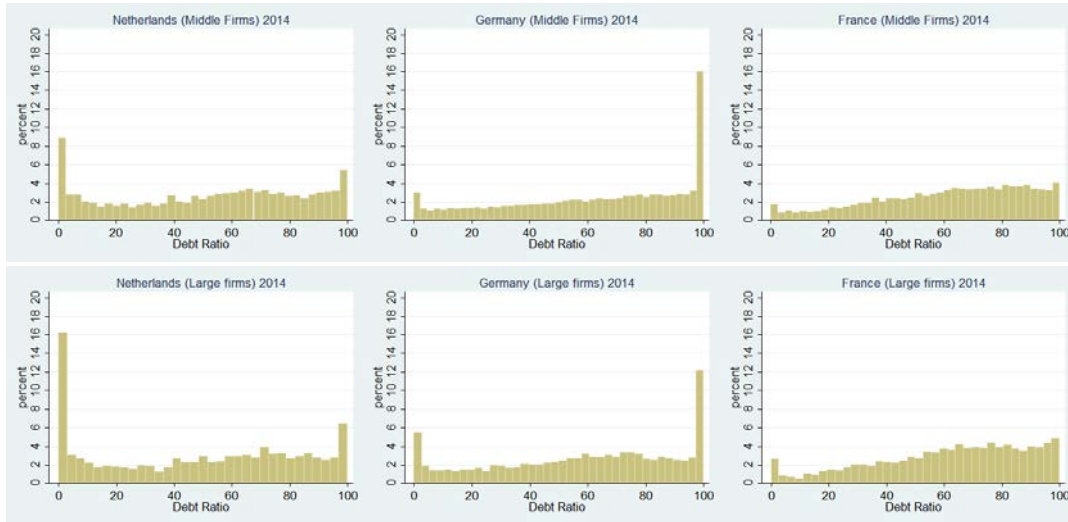
Industry classification

Tabel A.1 NACE industry classification

Section	Title
A	Agriculture, forestry and fishing
B	Mining and quarrying
C	Manufacturing
D	Electricity, gas, steam and air conditioning supply
E	Water supply, sewerage, waste management and remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M	Professional, scientific and technical activities
N	Administrative and support service activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
R	Arts, entertainment and recreation
S	Other service activities
T	Activities of households as employers
U	Activities of extraterritorial organisations and bodies

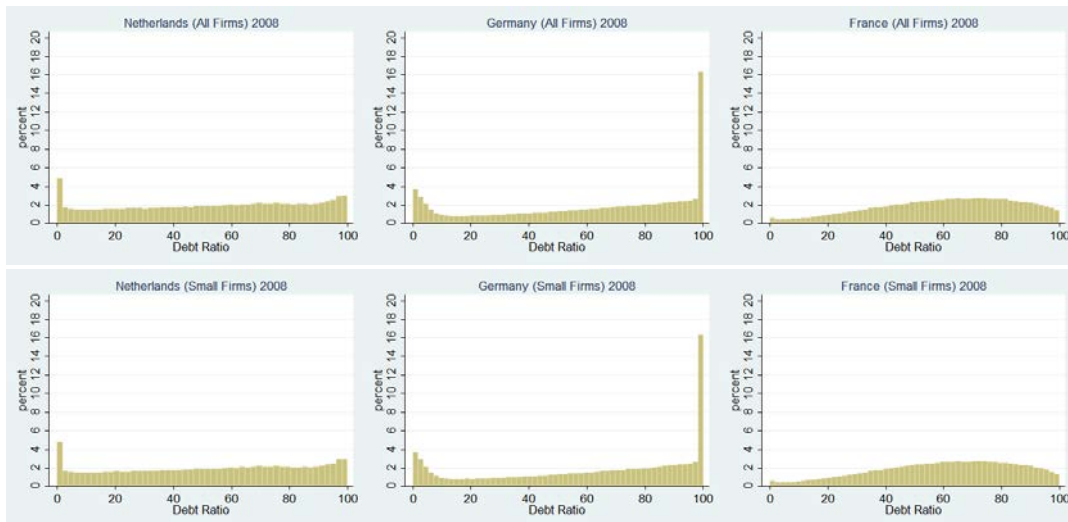
Additional figures

Figure A.1 Netherlands, Germany and France, histograms for debt ratios for medium and large firms in 2014



Source: Own estimations using the Amadeus database.

Figure A.2 Netherlands, Germany and France, histograms for debt ratios for all firms and small firms in 2008



Source: Own estimations using the Amadeus database.



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