The determinants of trade payables of Dutch SMEs

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ABSTRACT: This paper studies the determinants of trade payables and whether the recent crisis may have influenced all of this. From theory, several determinants were selected. The results show that determinants that have significant impact, are: asset structure, the liquidity, trade receivables, the asset size the type of industry and the crisis itself. Major changes in these determinants were not seen after the crisis.

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1. INTRODUCTION

The recent financial crisis (with the financial crisis, the 2008 financial crisis is meant) has left its marks worldwide, almost every economy and country has been affected by it. The influence of this crisis on banks has been great, some banks went bankrupt, others were able to continue, but not under the same circumstances. This all has influenced the financing by banks, bank loans has been harder to receive. The rate of rejection for a bank loan has increased from 6.1% in 2004 to 16.3% in 2008 (Sannajust, 2014). Due to the increasing of bank loan rejection, firms have to find other sources of financing. The financial structure has changed because of that. This paper focusses on small and medium-sizes enterprises (SMEs). SMEs form an important part of the private sector in developed and developing countries (Beck & Demirguc-Kunt, 2006). They are seen as the growth engine of many economies. In the UK for example, SMEs form 60% of the private sector employment (Lee, Sameen & Cowling, 2013). The gross national product of the USA is for 40-60% produced by SMEs, these SMEs employing for 50% of the working force (Neubauer and Lank, 1998). It is not a lie when stating that SMEs form a major role in today's economy. The SMEs of today are the big firms of tomorrow.

In The Netherlands, a developed country, the SMEs are important too. However, the financial crisis has hit hard in The Netherlands too. It is harder to obtain bank loans for example. The main reason for starting businesses to fail is inadequate financial resources (Gregoy, Rutherford, Oswald & Gardiner, 2005). Giving this, and the fact that 32% of the Dutch starters in 2009 are out of business only three years later, according to the Dutch newspaper NRC, the importance of investigation of the finance of Dutch SMEs has been clear.

The existing knowledge, papers and theories about financing after a crisis are mainly based on countries outside Western Europe. However, there are many sources of financing that SMEs are using. It is too much to imply all these sources, which is why one dominant source will be chosen. Given the available data, the dominant source that will be investigated is *trade credit*. As you will see in the theoretical framework, trade credit is for SMEs an important financing source. With trade credit as a financing source, trade payables is meant. The focus lies on the demand of finance, the demand for trade credit, which is trade payables. There is also a supply side of trade credit; trade receivables. However trade receivables will be mentioned in further sections of this thesis, as this paper is about the financing part of SMEs, it is logic to focus on trade payables.

The goal of this paper is to investigate the determinants of trade payables and if these determinants may have been influenced by the recent crisis.

This leads to some sub questions which are attempted to be answered:

- To what extent is trade payables used by SMEs as a financial source?

- What are the determinants of the usage of trade payables?

- Did the crisis changed the usage of trade payables, if yes, to what extent?

- Did the determinants changed because of the crisis?

To answer these questions, some hypotheses will be made. They are based on the existing theory, which will be given in the next section. In the methodology, the sub questions and the hypotheses will be made measureable. With data from Dutch SMEs, collected from the database Orbis, the determinants of trade payables will be analyzed and see how they interact with the level of trade payables used by the SMEs. The level of trade payables is measured as a percentage of the total assets of a SME. After the data analysis, were the data will be analyzed and discussed, conclusions will be made. The sub questions will be answered here. The thesis ends with a discussion/limitations section were the limitations of this thesis and suggestion for further research will be told.

2. THEORETICAL FRAMEWORK AND HYPOTHESES

The theoretical framework is structured as followed: first, finance in general will be explained so that it is clear where trade payables will stand in the whole financing aspect, theory about the financial crisis will be mentioned after that to see how the crisis has influenced the financing world. After that, the focus will be on trade payables (what is trade payables, where does trade payables appear on the balance sheet of firms, why firms are using trade payables) and its determinants (what are the possible and expected determinants of trade payables). Further, information about the recent financial crisis will also be provided, what the influence was of this crisis, how it changed the financing world and what this means for the usage of trade payables.

2.1 The financial crisis

With the recent crisis, the financial crisis from 2008 is meant. It started in the summer of 2007, at the end of 2008.

What was the effect of the financial crisis on banks? It all stared in the USA where mortgages were put into obligations and these were decreasing in value in a high pace. Financial institutes came in trouble and in the end, many billions were depreciated on those obligations. It was unclear which institutes would have troubles with it, so the money-market ran out of money, banks did not lend each other money. Many banks went bankrupt, others were nationalized or taken-over (Mody & Sandri, 2012)

As the economic growth was declining in the Netherlands, in 2009 and 2010 there was an economic contraction, banks received a higher risk on bank loans. Therefore, loan restrictions were made, banks are using stronger standards when granting credit (Kremp & Sevestre, 2013). It is more difficult to obtain a bank loan, especially for the smaller firms. Think about the theory of Berger and Udell (1998): information availability was an important factor for financing, but after the crisis, the role has been even more important, since banks and investors have lost their confidence in repayment of a loan.

This has far-reaching implications for SMEs and their financing since they are more bank dependent than large firms (Muñoz, Norden & Van Kampen, 2015). SMEs are characterized by a lack of information availability and are more risky than large firms (Muñoz et all, 2015) After the crisis they have more trouble obtaining a bank loan, SMEs face a high rate of rejection of bank loans since the financial crisis. The rate of rejection increased from 6.1% in 2004 to 16.3% in 2008. In The Netherlands, the rate of loan rejection in the first six months of 2012 was 33.9%. With this rate, the Netherlands are in the top 3 of the eleven countries from Europe and the USA, of loan rejection behind Ireland and Spain (Sannajust, 2014).

Dutch SMEs are having problems with their financing, since bank loans are rejected more often. Other finance sources should be found by the SMEs, trade payables for example: credit-rationed firms use trade credit (Casey & O'Toole, 2014) or informal lending; constrained firms use informal lending or loans from other companies.

2.2 Finance in general

Berger and Udell (1998) came up with the *financial growth cycle*. The financial growth model shows how the size, age and the available information about a firm influences the sources of finance. Size, age and information availability are all related with each other. Bigger firms are older and have more information available. They have more choices to choose from for their financial sources. Trade credit is one of the most used financial source. It is used by all firms (from very small firms to large firms). However, where large firms have more options to finance their business activities, smaller firms are much more limited in their choice. That is why trade payables is much more important for SMEs than it is for large firms.

2.3 Explanation of trade payables

Trade credit is the collective term for both trade payables and trade receivables. As this paper is about the financing of firms, the focus is on the demand side of financing, which is why the focus lays on trade payables. Trade receivables will also be discussed in the further parts as it seems to be a determinant of trade paybles. But more on that later.

Trade payables is financing which is provided by the suppliers of a firm in the form of delayed payments due on purchases made by the firm (Leach & Melicher, 2012).Trade payables has a major role in the finance of firms; Trade payables is one of the most important sources of short-term finance for most business Berry & Jarvis (2006) and Leach & Melicher (2012) say that accounts payables is an important source of funding. Accounts payables is a different term for trade payables.

Trade payables is a source of financing, a quite important one since most firms are using it. On the balance sheet of firms, the usage of trade payables can be seen on the side of liabilities and (owners') equity. It is under the liabilities of a firm, to be more specific; it can be seen under current liabilities. Which is quite logic, since current liabilities are due within a year of a firm's balance sheet date. Trade payables will often be paid within 30 or 60 days (the most common periods of time). Berry & Jarvis (2006) described trade credit as *financing provided by suppliers in the form of delayed payments due on purchases made by the venture*.

2.4 Benefits and drawbacks of trade payables

Why are firms using trade credit? That question can be viewed from different points, namely the supply side and the demand side. Since this paper is about trade credit as a financial source, only the demand side of trade credit (which is trade payables) will be taken into account.

Benefits
- Firms that are denied finance by other financial sources can still gain access to finance (Petersen & Rajan, 1997) (Seifert, Seifert & Protopappa-Sieke, 2013).
- Trade payables reduces transaction cost, which makes it more lucrative for the buying (and for the selling) firm (Petersen & Rajan, 1997) (Seifert et all, 2013)
- With trade payables, firms have quality guarantees. If the products or services do not meet a certain standard, they have the power to do something about it, since they have not paid yet. It gives the buying firm some advantage and power (Petersen & Rajan, 1997) (Seifert et all, 2013).

Drawbacks
- The demanding firms can be controlled through trade payables. It can give leverage to the supplying firms. Firms can be denied for trade payables, they are forced to buy large quantities or their terms of payments are denied and should be paid immediately. These are some possible things the supplier can do.
- The effective order quantity may not be achievable since the supplier has a different optimal quantity to produce (Soni, Shah & Jaggi, 2010).
- Price discrimination is in some cases not legal. However, with trade payables there are constructions possible which are very close to price discrimination (Petersen & Rajan, 1997).
- Another drawback which is related to the previous one is that the supplier has information about their customers. If a customer has less sales and/or is going to a though time, the supplier knows this since payments are delayed, the firm is buying less etc. This can lead to new terms of payments (like paying immediately). A firm who has its difficulties can get in more trouble with such actions. Suppliers have an informational advantage, which can lead to restrictions for the buying firms (Petersen & Rajan, 1997).
- Growing firms can remain loyal to their suppliers in times when they were a smaller firm (Petersen & Rajan, 1997). This is not a problem per se, but being loyal to a certain supplier can mean that a better and/or cheaper alternative is ignored.

2.5 Determinants of trade payables

In this sections, the determinants of trade payables will be discussed. These determinants are based on theory. The hypotheses will also be made when discussing the determinants of trade payables. The determinants which were found and will be investigated to see the relation it has with trade payables are: the asset structure of a firm (the ratio of current assets to total assets), the level of liquid assets, the level of trade receivables, the size of a firm, its profitability, its age, the growth a firm is having, the type of industry and the financial crisis.

2.6 Hypotheses

2.6.1 Current assets (asset structure)

Current assets are assets which are on the balance sheet for less than a year. They are used within a year for the firm's business. Firms with a high ratio of current assets to total assets (they have a high amount of current assets) are facing the fact that their assets will be renewed in a short amount of time. So, within a year, a big part of their total assets will have to be renewed. That is a fact. To do so, financial sources are needed. For current assets, trade payables is a good way to finance it. The ratio is measured as follow: ratio = current assets/total assets.

Current assets last less than a year, current assets includes cash and trade receivables (Powers & Needles, 2007). Cash and trade receivables are also determinants of trade payables, they will be discussed later. Since they are related, a correlation between current assets and cash and trade receivables on the other hand can be expected. But that will be handled in the other sections. For now, the following hypothesis will be taken into account.

The asset structure is how the assets of a firm are made up. The ratio current assets to total assets is one way to describe the asset structure. In further sections, when telling about the asset structure, this ratio is meant.

Niskanen & Niskanen (2006), Niskanen & Niskanen (2000) and Li (2011) found out that the ratio current assets to total assets has an influence on the usage of trade credit. A high ratio will lead to more trade credit used by the firms.

H1: A high ratio of current assets to total assets is related positively to trade payables

2.6.2 Liquid assets

Firms with a high level of liquid assets use less trade payables since they do not have the need to postpone payments. The level of liquid assets is calculated by the level of cash and cash equivalent divided by the total assets. Since liquid assets is part of current assets, this variable will be more includes as a control variable.

The theory on this is conflicting; Van Horne (1995) states that holding of liquid assets have a positive influence on accounts payables. Deloof and Jegers (1999) saw no such relation for Belgian firms. Cunat (2007) however describes a negative influence of liquid assets. He saw that when the level of liquid assets dropped, the level of accounts payables rised (Vaidya, 2011).

H2: High level of liquid assets will lead to a low level of trade payables

2.6.3 Trade receivables

Trade receivables is a type of short-term financial assets (Power & Needles, 2007). It is a form of current assets. Since the ratio of current assets to total assets is also included (see Hypothesis 4), correlation between these two determinants can happen. Trade receivables will be includes more as a control variable to see whether the asset structure or trade receivables (perhaps in combination with the level of liquid assets) influences the level of trade payables.

Firms with high levels of trade receivables also have a high level of trade payables (Bastos & Pindado, 2012). The reason is that firms do not have the resources available to pay their suppliers, since their customers postpone their payments. Love, Preve & Sarria-Allende (2005) found out that firms with a high proportion of short-term debt are significant providers of trade credit. Given the fact that providers of trade credit (firms with high account receivables) having a high level of account payables too, short-term debt is related to account payables according to these theories (Bastos & Pindado, 2012; Love et all, 2005).

H3: High level of trade receivables correspondents with a high level of trade payables

2.6.4 Size

The size of a firm tells something about how big a company is. The size will be measured as the natural logarithm of the total assets of a firm. The size of a firm can have an impact on their financing and on the usage of trade credit. Larger firms do not have the need to use trade credit (or other short-term debt) since they have the resources for financing available. Therefore, bigger firms are using less trade payables.

Where growing firms are using more trade payables, larger firms are using less trade credit (Niskanen & Niskanen, 2006; García-Teruel & Martínez-Solano, 2006; Li, 2011; García-Teruel & Martínez-Solano, 2009; Khan, Tragar & Bhutto, 2012; Niskanen & Niskanen, 2000). Basically, size is negatively related to trade credit, and growth, or growth opportunities, is positively related to trade credit.

H4: Size is negatively related to the usage of trade payables

2.6.5 Profitability

The profitability of a firm says something about the risk the supplier of trade credit has when granting credit to a firm. A profitable firm has a smaller chance of not be able to repay the credit. Therefore, the profitability of a firm is positively related to trade payables.

Tang (2014) found a direct relationship between trade payables and profitability. Trade payables is positively related to the profitability of a firm, according to the study of 71 SMEs from the Netherlands.

H5: Profitability is positively related to trade payables

2.6.6 Age

I expect that age will have a negative relationship with trade payables, since trade payables is a form of short-term debt, and because I expect that size and age are related; older firms are bigger and younger firms are relatively smaller (in most cases). Since I expect a correlation between size and age, age will be included as a control variable; maybe size is not the causing variable but age is. Another option is that both are causing the level trade payables and that size and age are not related. I can even imagine that age is positively related to the level of trade payables; older firms have a better reputation which means less risk. But since Hall et all (2000) found a negative relation between age and short-term debt, I expect that age is also related negatively to trade payables but that there is a correlation between the variables size and age.

As already mentioned before, Hall et all (2000) found out that short-term debt was influenced by size and age; both have a negative relationship with short-term debt. Size also has a negative relation with trade payables (see *hypothesis 3*).

H6: The age of a firm is related negatively to trade payables

2.6.7 Growth

Growth is also an indicator of the financial status of a firm (a growing firm has a better financial position, which makes it more likeable to grant credit for finance). Firms need finance to support their growth, a firm cannot just expand their activities. So, a growing firm has a good financial position and is seeking for finance. Therefore: growth and trade payables are related positively.

Bigger firms, with greater growth opportunities and greater investment in current assets, are receiving more finance from their suppliers. The amount of trade payables also increases with a raised investment in cash holdings, trade receivable and inventories (García-Teruel & Martínez-Solano, 2010; Niskanen & Niskanen, 2006; García-Teruel & Martinez-Solano, 2006 ; Li, 2011; Garciá-Teruel & Martínez-Solano, 2009).

Note, Niskanenen & Niskanen (2000) found out that the growth of sales is negatively related to trade payables. With growth is the growth in assets meant. The negative relation between trade payables and growth in sales can be explained easy: with more sales, more cash or other financial sources are within the firm. The need to use some source of financing will be reduced.

H7: Growth in asset size is positively related to trade payables

2.6.8 Type of industry

Hall, Hutchinson & Michaelas (2000) found out that there was a clear relationship between the capital structure of a firm and the type of industries it operates in. The average debt ratio's will vary from industry to industry since asset risk, asset type and requirements for external funds vary by industry; asset risk and asset type are the most important determinants of capital structure (Harris & Raviv, 1991).

Hall, Hutchinson & Michaelas (2000) did their research on the effects on short-term debt. They found out that size, age and asset structure are negatively related to short-term debt and that growth was positively related to short-term debt. They found differences between industries.

Garciá-Teruel and Martínez-Solano (2009) found out that the level of trade payables varies between the different sectors a firm operates in. Manufacturing has a lower level of trade payables

than wholesale trade (0.18 and 0.23 respectively). Services has the lowest (0.15) level of trade payables. These three sectors are the sectors that are included in this research. Other sectors were left out or combined in a logic way to have enough firms from every sector. The average level of trade payables was around 0.19 in the data results from Garciá-Teruel and Martínez-Solano (2009).

H8: There are industrial effects noticeable; services and manufacturing have both a negative effect on trade payables, wholesale and retail trade a positive impact.

2.6.9 The crisis
The expectation I have about the influence on the level of trade payables as a financial source and its determinants is that the level has inclined after the crisis. The theory states that *during* a crisis, the usage has increased, but after the crisis the level of trade payables will drop to the same level as before the crisis. However, I do not expect that the level of trade payables will be as high as it was before the crisis. Bank loans for example, has been harder to achieve for most firms, especially the smaller firms. Bank loans are an important financial source. When this is not an option for SMEs anymore, other sources are needed. Trade payables is a great alternative, since it is used frequently already, using it more is a simple step. As can be seen before, the advantages of trade payables show that it is an easy step for SMEs to use trade payables.

Trade credit can be an alternative for bank loans, when bank loans are declining. Gregory et all (2005) found out that during a financial crisis, trade credit is a substitute for bank credit. Firms denied credit for working capital tend to turn to trade credit (Casey & O'Toole, 2014). However, in Japan there was no evidence that trade credit was used more during and after a crisis (Taketa & Udell, 2007). There was some evidence that trade credit and the financial institution lending move in the same directing during the banking crisis. Trade credit and financial lending channels are complements.

H9: The level of trade payables has increased since the recent financial crisis

3. METHODOLOGY AND DATA
The theory states that the usage of trade credit as a financial source is determinate by several determinants (see *Theoretical Framework*). However, some suggested determinants may not have an influence on trade payables. On the other hand, the determinants may also influence each other, so the correlation between the determinants will also be checked.

A logic way to show and measure the relationship between the dependent variable and the independent variables and the control variables is to use a multivariable linear regression model:

Trade payables$_{it}$ = β$_0$ + β$_1$Asset structure$_{it1}$ + β$_2$Liquid assets$_{it2}$ + β$_3$Trade receivables$_{it3}$ + β$_4$Size$_{it4}$ + β$_5$Profitability$_{it5}$ + β$_6$Age$_{it6}$ + β$_7$Growth$_{it7}$ + β$_8$Type of industry$_{it8}$ + β$_9$Crisis$_{it9}$ + ϵ$_{it}$

3.1 Methodology
As can be read in the previous section, there are variables that influences the level of trade payables. To determine that influence, the relationship between the dependent variable (trade payables) and the independent variables will be investigated. The expected relation can be read within the hypotheses.

3.2 Variables
The dependent variable is the variable that is influenced by the independent variables, it is the variable on which this whole paper is based: trade payables (see Table 1 how trade payables is measured).

With trade payables$_i$ being the dependent variable, i and t are number of the firm and the year of measurement respectively, β$_1$Asset structure$_{it1}$; β$_2$Liquid assets$_{it2}$; β$_3$Trade receivables$_{it3}$; β$_4$Size$_{it4}$; β$_5$Profitability$_{it5}$; β$_6$Age$_{it6}$; β$_7$Growth$_{it7}$; β$_8$Type of industry$_{it8}$ and β$_9$Crisis$_{it9}$ are the independent variables. ϵ is the error term, β$_0$ is the constant term in this model. β$_1$, β$_2$, β$_3$, β$_4$, β$_5$, β$_6$, β$_7$, β$_8$ and β$_9$ are the coefficients on which this research is based, they presenting the relationships between the dependent variable and the independent variables (and perhaps the control variables)

3.2.1 Dependent variable
The dependent variable is the variable on which this paper is based. It is the part of trade credit that is used as a financial source by firms, namely trade payables. Trade payables is measured as the ratio of trade payables (in Orbis it is named as *creditors*) to the total assets (Zubair, 2015).The value can vary between zero and one.

3.2.2 Independent variables
The independent variables are the variables which I assume influence the dependent variable, according to the theory. These variables are known as the determinants of trade payables. In Table 1 is an overview of these determinants and how they are measured, in the next paragraph a more briefly explanation of the variables and how they are measured will be given.

The asset structure (level of current assets) is the ratio of current assets to total assets. It can have a value between zero (no current assets at all) or one (all assets is made up by current assets).

The size is measured as the logarithmic of the total assets of a firm (Tang, 2014). The logarithmic is used to avoid the symmetric distribution of the total assets (Tang, 2014; Garcia-Teruel and Martinez-Solano, 2014).

The profitability is measured as the per unit of assets return (Tang, 2014), measured as the ratio of the EBIT (earns before interest and taxes) to total assets. In Orbis, the value of the EBIT of a specific firm can easily be selected.

The growth is measured as the growth in total assets. However, data from 2005 was not available, so the growth of 2006 could not be measured.

The type of industry are provided by the database of Orbis. They are based on the major sector a firm operates in and the main section. The trade description tells the business activity of a firm and is also used to determine the industry. To have enough firms per industry, only three industries are included (manufacturing, services and wholesale & retail trade). In a logic way, the firms will be assigned to one of these three industries.

The variable crisis can have a value of zero (not having a crisis) and one (having a crisis). The years 2006 and 2007 are the period pre-crisis, the years 2012 and 2013 are known as the period post-crisis.

3.2.3 Control variables
The control variables are includes since they may influence the dependent variable, but it is possible that their influence is already covered by another variable. In the rest of this paper, the variables will be mentioned in the same order as in the hypotheses. This has been done this way since I assume that order makes the most sense and gives the best overview of the results.

Liquid assets is the ratio of liquid assets (in Orbis named by Cash and cash equivalent) to total assets. This ratio is pretty common to calculate the liquidity of a firm. Angora & Roulet (2011) uses this ratio to calculate the liquidity of banks. Values between zero and one.

Trade receivables is measured as the ratio of trade receivables (trade receivables goes by the name *debtors* in Orbis) tot total assets (Tang, 2014). Value varies between zero (no trade receivables) or one (all is made up by trade receivables).

The age is simply measured as the year of measurement (2006, 2007, 2012 or 2013) minus the year of incorporation.

The table below shows a summary of the variables and the definition. The definition is how the variables are measured with the data from Orbis. For example; trade payables is defined as creditors/total assets. Creditors and total assets are both terms used by Orbis (creditors is how Orbis has named trade payabables). Further, there is a column with the abbreviation of the variables which are used in some tables, formulas etc. Most abbreviations are quite logic, some needs an explanation why I choose that specific abbreviation. The abbreviation of size is SA, which stand for Size in Assets. The type of industry has more abbreviations, since there are three types of industries being used in this paper. The current assets to total assets ratio is mentioned as AS (Asset structure) since that ratio can also be seen as the asset structure. Control variables are also included, they are shown with the independent variables since they are shortly related to each other and this way a better overview can be given.

Variables	Definition	Abbreviation
Dependent variable		
Trade payables	Creditors / Total assets	TP
Independent/Control variables		
Asset structure	Current assets / Total assets	AS
Liquid assets	Cash and cash equivalent / Total assets	LA
Trade receivables	Debtors / Total assets	TR
Size	LN (Total assets)	SA
Profitability	EBIT / Total assets	PR
Age	Year of measurement - year of incorporation	AGE
Growth	(Total assets$_{t1}$ - Total assets$_{t2}$) / Total assets$_{t1}$	GR
Type of industry	Three types of industries	MA (manufacturing) SE (services) WH (wholesale)

Table 1: Variables

3.3 Data

This research has used the data from the database Orbis, the data is collected from the years 2006 and 2007 (these years are known as the period before the crisis) and the years 2012 and 2013 (period after the crisis). The data is collected from Dutch SMEs, this means that each firms has less than 250 employees and an annual turnover with a maximum of of €50 million (Article 2 of the Annex of Recommendation 2003/361/EC) SMEs can be divided into three categories: micro (<10 employees and <€2 million turnover), small (10-50 employees and a turnover with a maximum of €10 million and a minimum of €2 milion) and medium-sized (50-250 employees and a turnover between €10 million and €50 million). The complete definition also includes a limited amount of total assets (below €43 million). However,

the definition shows that one can use turnover and/or total assets. Since most of the variables are based on the total assets, I do not want to be limited in the amount of total assets. That is why I choose to use only the variables employees (less than 250) and turnover (less than €50 million yearly) as my indicators for SMEs.

This results in the following steps in database Orbis:

	Step result	Search result
1. All active companies and companies with unknown situation	1,696,888	1,696,888
2. World region/Country/Region in country: Netherlands	46,315	32,873
3. Number of employees: 2013, 2012, 2007, 2006, min=0, max=250, for all the selecter periods	124,09	2,224
4. Operating revenue (Turnover) (th EUR): 2013, 2012, 2007, 2006, min=0, max=50,000, for all the selected periods	234,359	346
	TOTAL	346

Table 2: Data procedure

There are 346 selected firms. However, some firms did not had all the data available, so they were removed from the data sample. Further, some firms had no data available in a specific year. Firms that were missing data in the years 2006 and 2007 or 2012 and 2013 were also removed. This means that a certain firm can have data for 2006, 2012 and 2013. This will lead to more observations in the second period, the period after the crisis (2012-2013). After removing the firms that had no data in one or both periods, calculations were made. After this, strange values (like negative results for age, trade payables, asset structure, liquid assets and trade receivables) and outliers were removed from the sample. In table 3 and table 4 an overview of the primary description of these data can be viewed.

4. RESULTS

The following tables (table 3 and table 4) shows the description of all the variables. There are two tables, one for the period before the crisis (the years 2006 and 2007), and one after (the years 2012 and 2013).

Table 3 and table 4 represent the minimum, the maximum, the average, the median, the standard deviation and the number of observations of the variables. In table 4 there is also a column with the differences between the average between the two tables (diff1) and the differences between the medians of the two tables (diff2). Since not every variable is normally distributed, I choose to show both differences which gives a better view of how the data may have changed since the crisis.

There were some data that had to be removed. Some data did not make any sense (like negative age, values that cannot be reached in reality; like an asset structure above 1), and some data had outliers that were too big and will have a big influence on the results. Outliers that had too much of an impact on the database were removed. In practice, values which were more than four standard deviations away from the mean were eliminated. Also some other negative values (for trade payables for example) were removed.

Trade payables was on average 0,10. This means that 10% of the total assets is trade payables. All trade payables ratio's lay between the 0 and 0,59. The size was on average 9,86 with a minimum of 7,38 and a maximum of 15,80. Note that these are the natural logarithm of the total assets. Profitability varies between -2,41 and 0,82 with an average around zero (0,02). The age is between 1 and 124 years. Liquid assets has an average of 0,14, meaning that 14% of the total assets is liquid assets. Trade receivable made up for 36% of the total assets on average (and varies between 0% and 100%). The asset structure varies between 0,01 and 1,00 with an average of 0,64 meaning that 64% of the total assets is accounted for current assets. The growth has an average slightly above the zero, meaning that there was a small growth in total assets. The observations in the first period is different than other observations, this is because only for 2007 the growth could be calculated.

In table 4 the differences between the averages (diff1) and the medians (diff2) of the variables is also shown. Only the growth had a significant difference between the averages. For the significant of the differences in median, a Mann-Whitney U test has been done. As can be seen, there was a significant difference between the profitability in both periods, between the age and between the growth. The difference in age is logic since the same firms are being used in the two samples.

06/07	Min	Max	Av.	Med.	SD	Obs.
TP	0,00	0,59	0,10	0,07	0,11	305
AS	0,01	1,00	0,64	0,72	0,31	305
LA	0,00	0,89	0,14	0,07	0,19	305
TR	0,00	1,00	0,36	0,34	0,26	305
SA	7,38	15,80	9,85	9,71	1,10	305
PR	-2,41	0,82	0,02	0,06	0,37	305
AGE	1	124	31,80	21	26,85	305
GR	-0,59	13,22	0,19	0,05	1,15	155

Table 3: Primary description of variables from 2006 and 2007

12/13	Min	Max	Av.	Med.	SD	Diff1	Diff2
TP	0	0,45	0,09	0,06	0,1	-0,01	-0,01
AS	0,01	1	0,64	0,73	0,31	-0,01	0,01
LA	0	0,86	0,15	0,06	0,2	0,01	-0,01
TR	0	1	0,35	0,33	0,25	-0,01	-0,01
SA	7,55	13,4	9,98	9,85	1,12	0,13	0,14
PR	-0,78	1,62	0,06	0,04	0,17	0,03	-0,02*
AGE	6	130	38,55	28	26,88	6,75	7*
GR	-0,73	1,79	0,04	0,01	0,27	-0,15*	-0,04*

Table 4: Primary description of variables from 2012 and 2013 (N = 301)

* means the difference is significant for a 95% confidence interval

Table 1 in the Appendices (see Appendices) shows how the variables are correlated with each other. The asset structure is highly correlated with trade receivables, as expected (0,689). It is also a little correlated with the size in assets (-0,539). This means that either the asset structure or the level of trade receivables has to be removed from the model, because of multicollinearity. The different models in table 5 are having the asset structure or the trade receivables as one of the independent variables and not both.

Table 5 represents the main research of this paper. It shows different models with varying independent variables. Model 1 and 2 are with the independent variable *growth.* This has led to

less observations since 2005 has been left out because of missing data. As can be seen, the impact of growth was quite small and since these values were not significant for the variable growth, growth will not taken any further into account to have a dataset with more observations.

Model 3 and model 4 are models with the crisis included. These models shows what the influence of the crisis was on the level of trade payables. Model 5 and model 6 is the same as the two previous models, but the crisis as an independent variable has been left out. As can be seen, the adjusted R^2 has decreased slightly (from 0,201 and 0,184 to 0,199 and 0,183 respectively). This means that the variance which can be explained by the crisis only, is pretty small.

Model 7 is the model with the asset structure and level of liquid assets included, since that combination has led to a higher adjusted R^2 in previous models. Further, the profitability has been left out since that results was only significant when increasing the confidence interval to around 50%. Model 8 is the same as model 7 but the crisis has been included again.

This section gives an explanation of the meaning of the values in table 5. These values are leading to the rejection or acceptation of the hypotheses. If a hypothesis is rejected, a possible explanation will be given. The values in table 5 are the β-coefficients from the multivariable linear regression model which has been given earlier in this paper.

The *asset structure*, or the level of current assets to total assets, seems to have the highest impact of all the variables. With a positive coefficient (of around 0,07), the conclusion can be made that a higher level of current assets has a positive influence on the level of trade payables. This agrees with the theory and with hypothesis 1.

The *liquidity* of a firm has a positive influence on the level of trade payables. A higher level of liquid assets will led to a higher level of trade payables. With coefficients that vary between 0,03 and 0,09, the impact is quite high compared to other. Another interesting thing is that the value is higher when trade receivables is included in the model (and/or the asset structure has been excluded). These results are conflicting with hypothesis 2. The level of liquid assets is not negatively related with the level of trade payables, but positive. A reason for this is that firms with more liquidity is less of a risk for firms that provide trade credit. The theory on this is also conflicting. Van Horne (1995) saw a positive relation, Cunat (2007) saw a negative one and Deloof and Jegers (1999) saw no relationship at all.

Trade receivables was highly correlated with the asset structure. It is no surprise that trade receivables also has a positive relation with trade payables, which is in line with hypothesis 3 and the theories that supported that hypothesis.

The *size*, measured in the total assets of a firm, has a negative impact on trade payables. This results could also be found in existing theory and in hypothesis 4.

The variable *profitability* seems to have conflicting results. When using the first two models, a negative relation can be seen. However, this is the results of a smaller dataset. In the other models, with a larger dataset, the relation between the profitability and trade payables is positive. Since I focus more on the larger database, I conclude that the relation is positive, although these results were not significant. A positive relationship agrees with hypothesis 5 and with the theory.

The impact of the *age* is quite small, but positive. When a firm is one year older, the level of trade payables has increased with a small but positive number. Hypothesis 6 is conflicting with these theory, the relation is not negative but positive. A possible reason

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
AS		,061* (,00)	,074* (,00)		,073* (,00)		,073* (,00)	,074* (,00)
LA	,070* (,00)	,033 (,14)	,046* (,03)	,094* (,00)	,045* (,03)	,093* (,00)	,046* (,02)	,047* (,02)
TR	,030 (,11)			,047* (,01)		,046* (,01)		
SA	-,029* (,00)	-,024* (,00)	-,023* (,00)	-,027* (,00)	-,023* (,00)	-,028* (,00)	-,023* (,00)	-,023* (,00)
PR	-,004 (,76)	-,004 (,79)	,008 (,52)	,007 (,59)	,008 (,56)	,006 (,63)		
AGE	,000 (,15)	,000 (,09)	,000* (,03)	,000* (,05)	,000* (,04)	,000 (,07)	,000* (,03)	,000* (,02)
GR	-,003 (,64)	-,003 (,55)						
MA	,031* (,00)	,022* (,03)	,023* (,01)	,035* (,00)	,023* (,01)	,035* (,00)	,023* (,01)	,023* (,01)
WH	-,020 (,08)	-,032* (,01)	-,039* (,00)	-,024* (,02)	-,039* (,00)	-,024* (,02)	-,038* (,00)	-,038* (,00)
CRISIS			-,011 (,15)	-,010 (,17)				-0,01 (,16)
Adj. R2	,179	,194	,201	,184	,199	,183	,200	,201
#N	456[1]	456	606	606	606	606	606	606

Table 5: Different models
* significant at 95% interval

can be that older firms has built up a more intensive relationship with their suppliers who are granting more trade credit to their regular customers.

Growth has a negative impact on trade payables, as can be seen in table 5. Although growth is a difficult variable since the data was not always available, the results do show a negative impact. A possible reason can be that growth is often financed by other sources. However, these results were not significant so this conclusion is quite questionable.

Type of industry: Manufacturing has a positive impact and wholesale and retail trade a negative one. The theory and hypothesis 8 were saying exactly the opposite. Reasons for this can be that the alignment of firms to a certain type of industry was not done correct, or the assumptions from the theory could not be made for Dutch firms, since the theory was not about Dutch firms in particular. Further research can be needed to specify these conflicting results.

As can be seen in table 5, a firm that has suffered from *the crisis* has a lower level of trade payables. In table 3 and 4 there was also a difference in the level of trade payables, so the results in table 5 does not come as a complete surprise. The hypothesis that was made states that the level of trade payables has increased since the crisis and thus that the influence of the crisis was positive. This is not the case. The theory states however that the level of trade payables decreases *during* a financial crisis and will

go to the same value as before the crisis. It is possible that firms are still in crisis mode, or that the level is almost at the same level as before. Another reason can be that it is harder for firms to receive credit from their suppliers.Note that the difference in the primary description (table 3 and table 4) and the coefficients in table 5 are not significant.

5. ROBUSTNESS CHECKS
The level of trade payables varies between industries, which can be seen in the results. But the type of industry may also influence other variables. For example, firms that provide services are different than manufacturing firms. The last one is in most cases older (takes years to set-up a manufacturing firm), have less growth opportunities, less liquid assets and less current assets (their assets last longer). So, it is quite logic to think that the independent variables of this paper vary between industries.

To check for the differences between industries, some tests were made. Table 2 in the Appendices (see the Appendices) represents the results of these tests. The β-values in this table varies. However, big changes cannot be seen (with a significant results). Given these data, I cannot say that there are major differences between industries and before and after the crisis. Further research with a more detailed dataset and significant results can accept or reject the conclusion I made. This conclusion is: there are no major differences in the determinants

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[1] Growth was not available in 2006. That is why the number of observations is less compared to the other models.

of trade payables between industries (however the level may vary) and in the period before and after the crisis.

Further, I have checked if there were differences between the two periods (2006/2007 compared to 2012/2013). Table 3 and 4 show almost no (significant) differences). Table 3 in the Appendices (see Appendices) shows different models for the two periods. There are no major differences noticeable between these periods.

6. CONCLUSION

The Dutch SMEs are using trade payable around 10 percent of their total assets. This number is quite consistence before and after the crisis. There was not a significant difference between these two periods.

According to theory, the determinants of the usage of trade payables were: the asset structure/current assets to total assets ratio, level of liquid assets, trade receivables, the size of a firm, its profitability, the age, the growth in total assets, the type of industry and the crisis.

With the research, I cannot say that growth and the profitability is a (major) determinant. The determinants which had the highest impact were: the asset structure, the level of liquid assets, trade receivables, the size and the type of industry.

The recent financial crisis has changed the usage of trade payables slightly. However, the difference between the level before and after the crisis were nog significantly different. The usage has been decreased since the crisis.

As can be seen in table 3 and 4, there were differences, but those differences were not significant. I can conclude that there were no changes noticeable. Table 3 in the Appendices (see Appendices) are in line with this conclusion. The models from the years 2006/2007 do not differ much with the models from the years 2012/2013.

7. LIMITATIONS AND RECOMMENDATIONS

Some results were not significant, further research is therefore needed. Also the variable *growth* is not measured in the period before the crisis since there was no data available. Further research should also cover that up. Also, the differences between industries was not significant, and since there were only three types of industry used, a more detailed research on this part should clear the insecure issues on this part out. I still have the feeling that there are differences between industries, since there are so many differences (in financial terms) between industries. Further research should include more firms from more industries so that more industries can be investigated. Another limitation is that the R square shows that the model is not perfect, it does not represent a large part (around 20 %). This means that there are possible more determinants. Another thing is that it is possible that trade payables is not only related to those determinants, but that the determinants are also influencing each other. That is the reason why it is hard to come up with a *perfect* model, or impossible. A reason for this may be that a lot of the variables are asset based, it is all related to the total assets. If there is more research about this topic, an idea is to have different variables which are not all related to the total assets of a firm. The level of trade payables has decreased, which can mean that the firms are still in a crisis. Further research should investigate the levels of trade payables in years after 2012 and 2013 to see how the level of trade payables has changed after those years. Perhaps different conclusions can be made. Also, this research is based on SMEs. This means a cut-off at a certain number of employees ($<$250) and a value of yearly turnover ($<$€50 million). Firms that met these criteria in 2006 could have grown in the years after that, but they are not included anymore since they do not meet the requirements for being a SME. This means that firms that have grown hard were excluded. This could have influenced the factor *growth*.

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APPENDICES

	TP	SA	PR	AGE	LA	TR	AS	GR
TP	1	-,348**	,027	-,025	,156**	,165**	,329**	-,062
SA		1	-,015	,213**	-,090*	-,404**	-,539**	,108*
PR			1	,059	,073	,011	,036	-,015
AGE				1	-,131**	-,222**	-,240**	-,004
LA					1	-,226**	,302**	-,058
TR						1	,689**	,081
AS							1	-,004
GR								1
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Table 1: Correlations between the (in)dependent variables

	Period before crisis						Period after crisis					
	Manufacturing		Services		Wholesale		Manufacturing		Services		Wholesale	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
Constant	,163	,298	,299	,000	-,056	,828	,184	,201	,311	,000	-,061	,723
SA	-,015	,310	-,025	,000	,006	,786	-,014	,308	-,027	,000	,005	,749
PR	,000	,981	,014	,580	,154	,359	-,055	,341	,056	,174	-,036	,673
AGE	,000	,244	3,024E-05	,919	,000	,627	,001	,044	,000	,429	,000	,770
LA	,094	,173	,106	,224	-,100	,407	,053	,301	-,077	,179	-,100	,276
TR	,146	,025	,003	,968	-,102	,342	,020	,778	-,091	,096	-,202	,021
AS	,053	,358	,042	,613	,138	,263	,042	,426	,142	,010	,235	,014
GR							-,045	,226	,033	,211	-,017	,689

Table 2: Differences between industries

	2006/2007	2006/2007	2012/2013	2012/2013
AS	,079*		,070*	
LA	,075*	,137*	,022	,060*
TR		,073*		,021
SA	-,022*	-,024*	-,024*	-,030*
PR	,009	,007	,004	,009
AGE	,000	,000	,000*	,000
MA	,032*	,044*	,015	,026*
WH	-,036*	-,021	-,041*	-,027*
Adj. R^2	,193	,188	,195	,170
#N	305	305	301	301

Table 3: The models before and after the crisis
* significant at 95% interval