

# Finance and Growth: Dutch Independent SMEs

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## ABSTRACT

**This paper studies the effect of financing methods on growth of Dutch independent SMEs. It analyzes the effect of internal and external financing on growth using multiple regressions model accounting for various control variables. How growth is financed during financial crisis years and after the crisis years is investigated. The results show that growth is apparent in the years during the crisis years (2009-2012) and practically non-existent during the post crisis years (2013-2015). However, access to finance is available during both periods and it is found that Dutch independent SMEs finance their growth during the crisis according to the pecking order theory.**

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## Keywords

Dutch SMEs, firm growth, pecking order theory, external finance, internal finance, financial recession.

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## 1. INTRODUCTION

We all know the big corporations such as Google, Microsoft or Apple that greatly affect our everyday life and of which we believe they are key in determining where our future is heading. But hidden behind these big corporations there is a far more important driving force of the economy; the small and medium-sized enterprises (SMEs) (Farinha & Felix, 2015). According to them SMEs have been disadvantaged the last years, illustrated by Portuguese SMEs' growth that was affected by a decrease in bank loans due to more restrictive lending standards. This is also found by de la Torre, Martínez Pería and Schmukler (2010). In the Organization for Economic Cooperation and Development (OECD) countries, SMEs account for 95% of all enterprises and generate two-thirds of employment (Muller et al., 2016). In the European Union (EU) in particular, SMEs represent 99% of all enterprises and contribute to more than half of all value-added created by businesses (Michala, Grammatikos & Filipe, 2013). The SME sector also has contributed significantly in higher employment growth, output, promotion of exports and fostering entrepreneurship (Gupta, Guha & Krishnaswami, 2013).

In the past, firm growth has been studied extensively. A different strand of literature examines the growth of companies without reference to its financial structure or access to external finance. Hart and Paris (1956), Janovic (1982) or Nelson and Winter (1982), for example. The literature regarding availability of finance for SMEs and SME growth has been getting more attention lately (e.g. Hall, Hutchinson & Michaelas, 2004; Berger & Udell, 2006; de la Torre, Martínez Pería & Schmukler, 2010; Peric & Viteciz, 2016). Chittenden et al. (1996) show that the financial structure is related to the growth of a small firm and that profitability, age, asset structure, size, and access to the capital market are related to the firm's capital structure<sup>1</sup>.

But very little research has been done in relation with the economic recession (e.g. Peric & Viteciz, 2016; He & Ausloos, 2017). According to Davidsson, Achtenhagen and Naldi (2006) most studies on business growth are based on SMEs but even though a large number of studies on SME growth has been conducted, the knowledge about the phenomenon is far from complete. This is due to the fact that many different conclusions are drawn regarding whether the amount of outstanding bank loans decreased due to more restrictive lending standards or due to a decrease in demand for capital. Secondly, there is no consensus regarding the reason SMEs' growth was affected due to a shortage of capital during the crisis or that they were not harmed by this and financed growth internally. I will add knowledge to this by adding information and data regarding growth in combination with the crisis in the Netherlands and study the growth as well as financing methods.

The global financial crisis, which started during the year of 2008 is considered by the IMF (2008) to be the most dangerous recession since the Great Depression. The financing problems became even worse than usual for SMEs (He & Ausloos, 2017). Between 2008 and 2010 the amount of outstanding loans lost its steady growth and even decreased (Dutch Banking Association, 2017) due to more restrictive lending standards, which is a consequence of the financial crisis of 2008. The financial crisis of 2008 was the biggest one since the great depression of 1929-1933 (Barrel & Davis, 2008). In 2011 only 57% percent of the Dutch small-sized businesses got a bank-loan and only 70% of the medium-sized businesses could get a bank-loan (Financieringsmonitor 2011, onderzoeksinstituut EIM), while de

la Torre, Martínez Pería and Schmukler (2010) found that SMEs are highly dependent on bank loans to finance growth. Usually SMEs are financially constrained and in this period of recession they were severely constrained (i.e. they do not obtain the capital they desire) (de la Torre, Martínez Pería & Schmukler, 2010). According to Erkens, Hung and Matos (2012) the root of this financial crisis lies in the macroeconomic factors such as loose monetary policies, and the failure of the banks resulted in a freeze of global credit markets. According to Kapan and Minoiu (2018) the bank's ability to sustain lending during a financial shock is determined by the strength of their balance sheets. Especially banks that relied more on market-based funding reduced the supply of credit more than other banks.

An important obstacle to growth is restricted access to economic capital. (Rossi et al, 2016). So, when external financing is not or less available, as was the case during the crisis according to de la Torre, Martínez Pería and Schmukler (2010), firms have to find financing elsewhere. Internal financing is often used to finance growth and according to Ross et al. (2013) this is the cheapest form of financing. However, according to He and Ausloos (2017) internal financing cannot satisfy SMEs' development. Therefore I could argue that the growth of SMEs is influenced due to a decrease in access to capital.

The combination of the facts that SMEs are financially constrained (de la Torre, Martínez Pería & Schmukler, 2010), that SMEs are highly dependent on bank finance (Beck, Demirgüç-Kunt & Maksimovic, 2005) and that SMEs form the backbone of the European economy (European Commission, 2018) makes it a worthwhile subject to study. According to Treur and van der Hei (2016) Dutch SMEs find it hard to meet the credit terms of bank loans. Thus it might be interesting to investigate whether SMEs' growth remains positively influenced (Kremp & Sevestre, 2013) by their access to capital during the crisis and post-crisis or that they were negatively influenced due to a decrease in access to capital (Dutch Banking Association, 2017). Thus, the following research question is formulated;

*Do SMEs finance their growth through internal financing during the financial crisis and post-crisis due to a decrease in access to capital?*

This thesis intends to investigate whether the effect of the decreased access to external finance (i.e. bank loans) for Dutch SMEs influenced growth during the crisis, which I define as the years between 2009 and 2012<sup>2</sup>, and the post crisis, which I define as the years between 2013 and 2015 to have sufficient data to analyze. Thus, the fact that Dutch SMEs are financially constrained, highly dependent on bank finance and that they form the backbone of the European economy (together with SMEs from other European countries) makes it interesting to study. Also very little research has been done in relation with the economic recession. Growth of SMEs combined with crisis has been studied somewhat, although limited, and not regarding Dutch SMEs. Therefore it is interesting to study this relationship for the Dutch SMEs.

The contribution to the literature is closely aligned to the motivation behind the study. To provide evidence in terms of growth during the period of crisis and post-crisis and a comparison between these two periods regarding financing methods. Next to that, given that the amount of SMEs is so large compared to large companies and that SMEs are vital for economic recovery from a financial crisis (Rossi et al, 2016), this

<sup>1</sup> Capital structure is the mixture of long-term borrowing by the firm (longer than 1 year) to finance its long-term investments. (Ross et al., 2011)

<sup>2</sup> According to The Guardian (2012) the financial crisis ended in June 2012 after the Spanish borrowings reached a record high.

study is an important contribution to provide more evidence to stimulate economic recovery after a crisis.

I deviate from existing approaches in three ways. Firstly, instead of focusing solely on SME growth and access to finance I study growth of SMEs and access to finance combined with the financial crisis. Secondly, instead of focusing on the time frame from 2008 and on, I study from 2009 and on to avoid having non-crisis data in my sample. Thirdly, while most researches focus on growth differences between countries, I try to explain how firms grew and how they financed this in the Dutch market.

The results show that Dutch SMEs were able to grow during the financial crisis. Internal financing is preferred the most by Dutch SMEs, as is according to the pecking order theory. The importance of bank loans remains the same during the crisis and post-crisis period and it seems that internal financing is more important for growth than external financing. The results do not show that financing is a restraint on growth for Dutch SMEs.

The remainder of the paper proceeds as follows. Section 2 discusses relating literature regarding growth, financing theories and growth determinants as well as the hypothesis development. Section 3 includes the data sample, the variable definition and how my sample will be analyzed. Section 4 includes the descriptive statistics of the variables, a Pearson correlation matrix and the regression results. Section 5 summarizes and concludes the paper. Section 6 contains the acknowledgement and section 7 the references. Section 8 contains some tables which are referred to in this thesis. There are referred to by the table numbers mentioned in the sections.

## 2. THEORITICAL FRAMEWORK

### 2.1 Firm growth

Marris and Wood (1971) describe two different growth concepts, following Penrose (1959). The first being of absolute nature, for example sales or output. The second is less tangible, which is about process changes or quality changes. Davidsson and Delmar (1997) also distinguish two types of growth; internal expansion and external expansion. Internal expansion being growing organically, meaning firms need to retain sufficient profits to be able to purchase new assets. This way, the total value will increase over time. The second type of growth they describe is external expansion, meaning integrating with other firms. This can be through merging, in which there is mutual agreement, or through acquisition, where one firm is purchased by the other, whether they agree or not. Penrose (1959) describes the advantages and disadvantages of firm growth. The advantages are mainly being able to capitalize on the economies of scale in purchasing, marketing and overheads and being more powerful and adaptive through the ability to influence the market price and to reach new customers. The disadvantages, however, are also not negligible. Larger businesses tend to be more complex than smaller businesses. Also, growing businesses often experience a shortage of cash due to the necessity to purchase new premises or equipment, a loss of control, compromised quality since an increased output often results in a decline of quality. Growing businesses also often experience an increased staff turnover due to a decline in moral and an increase in capital requirements, since larger businesses also need a larger workforce. Altogether, growth brings a lot of advantages but can also put pressure on staff, resources and finances.

Peric and Viteciz (2016) find that Croatian manufacturing and service industries grew during the economic recession, which they define as the period between 2008 and 2013. This is supported by Notta and Vlachvei (2014) who find that Greek food manufacturing firms did grow during the financial recession. This is also supported by Tan (2008) who finds in a

sample of 277 firms from eight different Asian countries that they still grew during the 1997-1998 Asian financial crisis. He and Ausloos (2017) also find that SMEs grew during the period of crisis. They studied 158 small and medium-sized firms in China between 2004 and 2014 and find that growth was significantly negative before 2008 and significantly positive after 2008. Hodorogel (2009) found in her research that, even though managers have a negative expectation about profitability, Romanian firms grew at a record rate of 7.8% in 2008.

Mansfield (1962) argues that slow or no-growing firms eventually exit the sample and introduce a survivorship bias in the sample. This means that while testing Gibrat's Law, the test becomes a test of growth conditional on firm survival. Since I am not testing this law, I am not subject to survivorship bias.

### 2.2 Financing theories

According to Ross et al. (2011) finance consists of three main areas; corporate finance/financial management, investments and financial markets. Financial management is basically about how to finance a firm's short-term and long-term activities. They argue that the goal of Financial management is to maximize the current value per share of the existing equity. According to Ross et al. (2013) there are two sources of finance; internal financing and external financing. Internal financing basically means that it is financed by firm owners, reinvested profits, selling off assets or reducing the amount that needs to be borrowed. External finance on the contrary, means that the financing capital comes from outside the firm. But in this study I am going to include all external financing through studying the firm's total debts.

The static trade-off theory and the pecking order theory are two financial principles that help a company choose its capital structure (Adair & Adaskou, 2014). According to Scherr and Hulburt (2011), it is vital to try to understand the capital structure of SMEs, given the fact that SME must frequently carry out adjustments regarding target debt. The static trade-off theory, proposed by Modigliani and Miller (1963) concerns the optimal debt ratio for a firm. The trade-off theory is initiated upon the strong assumptions that capital markets are perfect and there are neither tax nor agency or transaction costs (Modigliani and Miller, 1963). According to Adair & Adaskou (2014) SMEs face little to no agency costs between managers and shareholders due to confusion, unless the firm belongs to a group. They do acknowledge however, that agency conflicts do arise between owners and lenders. Kraus and Litzenberger (1973) provide a classic statement of the theory that optimal leverage reflects a trade-off between the tax benefits of debt and the deadweight costs of bankruptcy. The idea of the trade-off theory of capital structure is that a company chooses how much debt and equity finance to use by balancing the costs and benefits (Wikipedia, 2018). According to Myers (1984) a firm that operates according to the trade-off theory is setting a target for the debt-to-value ratio and tries to gradually move towards their set target. The advantage of this approach is that the debt payments are tax deductible and that it is considered to be less risky than internal financing. According to López-García and Sogorb-Mira (2008) SMEs aiming to reach optimum leverage, as the static trade-off theory aims for, are usually better trusted. One of the shortcomings is that debt costs interest, which results in higher costs for the firm. This is supported by several other studies (e.g. DeAngelo & Masulia, 1980; Fama & French, 2002), who also find that firms can benefit from debt tax shields and therefore see a positive relationship between effective tax rate and debt in SMEs.

According to Serrasqueiro and Caetano (2012) firms may be financially constrained due to information asymmetry between managers and investors. According to Chen (2005) the pecking

order theory assumes that the firms choose finance capital according to the following preference order: internal finance, debt and lastly equity. This means that financing internally is preferred, then getting a loan and selling stocks the least. This is also supported by Leary and Roberts (2004). According to Khan (2013) the firm must first go for internal resources, since this leads to zero flotation costs and does not require disclosure of information. When they decide to finance growth with external resources it has to be in this specific order; debt financing, issuing convertible securities, issuance of preferred stock and finally issuance of ordinary stock. Ang (1991) and Holmes and Kent (1991) point out that the pecking order theory applies to SMEs, excluding SMEs that belong to a group (Kremp & Phillippon, 2008). According to Adair & Adaskou (2014) SMEs prefer internal financing over external financing, as well as debt over equity. Myers and Majluf (1984) argue for the existence of information asymmetry between managers (insiders) and investors (outsiders). According to Leary and Roberts (2004) information asymmetry between the firm's well-informed managers and its less-informed investors is at the core of the pecking order theory. According to them information asymmetry can cause mispricing of new securities and a loss of wealth to the firm's existing shareholders. When a company finances itself, this problem is non-existent, but the amount of risk the firm is taking also increases. So the order of financing preference is derived from a weigh-off between information asymmetry costs on the one side and involved risk on the other. In the pecking order theory the latter is considered less problematic than the former. According to Sogorb-Mira (2005) the pecking order theory therefore expects a negative relationship between profitability and debt in SMEs. This assumption is supported by the findings of Sogorb-Mira (2005), Ramalho and Silva (2009) and Gonzalez & Gonzalez (2012). The advantage of the pecking order theory, i.e. trying to finance growth internally at first, is that it sends a powerful message to the public, namely that the company is strong because it finances itself. Next to that it shows that finance managers are keen to keep control over the company and it helps to decrease the costs of equity and agency problems (Khan, 2013). According to Khan (2013) there are also two limitations to the pecking order theory; it fails to incorporate the effect of taxes, cost of issuing new securities, agency cost and financial distress of the investment opportunities, and it allows financial managers to accumulate so much financial slack that it protects them from market discipline<sup>3</sup>. López-García and Sogorb-Mira (2008) find clear evidence that SMEs follow a funding source hierarchy, which means the pecking order theory predicts the order of financing correctly. But paradoxically, they also find that greater trust is placed in SMEs operating according to the trade-off theory.

### 2.3 Determinants of firm growth

According to Rahaman (2011) the potential for growth of a business and its staying power are at risk when there is not sufficient access to finance. According to Scherr and Hulburt (2011), it is vital to try to understand the capital structure of SMEs, given the fact that SME must frequently carry out adjustments regarding target debt. There has been a lot of research considering the access to finance and growth (e.g. Hart and Paris, 1956; Chittenden et al. 1996; Berger & Udell, 2006). Demirguc-Kunt and Maksimovic (1998) investigate the relationship between financing and growth and find that the former does influence the latter. A separate strand of literature addresses determinants of firm growth excluding financial

variables, including age and size for example. Hart and Paris (1956) find that growth is independent of the age of the firm in a classic empirical study with British companies suggesting evidence of Gibrat's law<sup>4</sup>. Many other studies find that Gibrat's law holds (Fariñas and Moreno, 2000; Audretsch, Klomp and Thurik, 2002; Lensink, van Steen and Sterken, 2005). However Dunne et al. (1988) and Evans (1987a,b) empirically find that a firm's growth rate and age are related. Dunne et al (1988) and Dunne and Hughes (1994) find that younger firms have a greater chance of going bankrupt getting rid of excess employees. Janovic (1982) finds that when size is held constant the growth rate of a firm decreases as the age of the firm increases. All things considered, to determine the relationship between finance and growth rate, variables such as size and age should be accounted for in any regression analysis, since their effect on growth is found to be significant both negatively and positively.

Liu and Li (2001) argue that the growth of national bank loans is positively related to the growth of firms. This is supported by Cheng and Degryse (2006). Aziz and Duenwald (2002), however, find no evidence that banking development spurs growth and Boyreau-Debray (2003) find that the banking sector has a negative effect on firm growth.

Capreuter and Peterson (2002) argue that internal financing is a constrain for SME growth.

### 2.4 Hypothesis development

According to Beck, Demirguc-Kunt and Maksimovic (2005) SMEs are highly dependent on external finance to finance growth. According to Khan (2013) and Leary and Roberts (2014) firms should finance their growth through internal financing since this reduces costs and information asymmetry. This is supported by the pecking order theory in which, according to Chen (2005), the financing is in this preference order: internal finance, debt and lastly equity. Access to external financing was harder for SMEs in the years of the financial crisis (de la Torre, Martínez Pería and Schmukler, 2010). SMEs were constrained by the unavailability of internal financing (Carpenter & Petersen, 2002), but according to Khan (2013) and Adair and Majluf (1984) internal financing is the cheapest form of financing and therefore preferred to finance growth. The advantage of internal financing is that it sends a powerful message to the public, namely that the company is strong because it finances itself. According to Rahaman (2011) this leads to an increased likelihood of being granted external financing as well. Therefore I formulate the following hypothesis:

*H1: Internal financing has a positive effect on the growth of Dutch SMEs during the financial crisis and post-crisis.*

Internal financing and growth should therefore have a positive relationship. When internal finance is available, this can be utilized as the cheapest form of financing. The pecking order theory suggest that the most preferred form of financing is internal financing. According to Khan (2013) the firm must first go for internal resources, since this leads to zero flotation costs and does not require disclosure of information. López-García and Sogorb-Mira (2008) find that SMEs follow a clear funding hierarchy as is described in the pecking order theory and according to Khan (2013) financing growth internally is more cost-effective. Therefore I would expect that Dutch SMEs prefer to finance growth by using internal finance, as is according to the pecking order theory.

<sup>3</sup> Market discipline is a market-based promotion of the transparency and disclosure of the risks associated with a business or entity.

<sup>4</sup> The key assumption of Gibrat's law is that the growth of a firm, in any given period of time, is independent of the size at the beginning of the period.

H2: Dutch SMEs prefer to fuel their growth by using internal finance.

### 3. METHODOLOGY AND DATA

#### 3.1 Data sample

According to Serrasqueiro and Caetano (2012) and Adair and Adaskou (2014) SME include the companies with over 10 employees and less than 250 employees, the annual revenue between €10 million and €50 million or a balance sheet total of more than €10 million and under €43 million. This is also supported by the OECD (2005). They classify small enterprises as companies with between 10 and 49 employees, an annual revenue between €2 million and €10 million and a balance sheet between €2 million and €10 million. Medium enterprises are classified as such when the number of employees are between 50 and 249, annual revenue between €10 million and €50 million and a balance sheet between €10 million and €43 million. Micro-enterprises<sup>5</sup> are excluded since they often do not provide sufficient financial data. When two of the three criteria for SMEs, according to the OECD (2005) and Mkb servicedesk (2018), are met, the company will be included in the data sample.

To measure financing and test the hypotheses, annual data on firm size are needed. The panel data will be derived from the database Reach from Bureau van Dijk, since this database is especially made for researching Dutch SMEs. Reach contains financial and non-financial information about these Dutch companies. Reach can be used to gather the data for this research since it focusses on small and medium-sized firms, as well as this thesis does. Since we do not have access to Reach anymore, but we do have datasets extracted from Reach, I am going to use that data from Reach downloaded at the University of Twente.

According to Barrell and Davis (2008) the economic recession reached its climax at the end of 2008. Therefore I want to start analyzing from the point it was the worst and see how it turned out. Since the worst period was the end of 2008 (e.g. Barrell and Davis, 2008; The Balance, 2018), I want to start analyzing from 2009, since the negative development of the crises ended in 2008. This results in that I am going to analyze the Dutch SMEs for the years 2009-2015. This contains four years of crisis and after that 3 years of post-crisis.

I only want to include SMEs that have their office in the Netherlands and provide unconsolidated statements. These filters lead to an initial sample of 763,653 companies. Next to that, only companies with at least 3 data points per variable will be included in the sample. SMEs often do not report all their data on a yearly basis. Therefore they will only be included when there are a minimum of 3 observation per variable. Furthermore, financial institutions will not be included since their capital structure and risk-taking differs from non-financial institutions (Bhagat, Bolton & Lu, 2015; Kayhan & Titman, 2011). Governmental organizations are excluded as well as non-profit organizations. Therefore organizations with a US SIC code between 6000 and 6999 and 8000 and 9999 have been removed from the sample (NAICS, 2018).

Across different types of industries target capital structures may vary (Degryse, de Goeij & Kappert, 2012). Therefore the SMEs will be classified in their respective industries for the purpose of drawing conclusions.

The final dataset consists of 3363 SMEs which will be analyzed, depicted by industry in table 1. The Agriculture, Forestry And

Fishing industry makes up 3.4% of the data sample, Mining only 1% and services and Retail Trade make up respectively 10% and 6.1% of the data sample. The bigger factors are Manufacturing with 24.6%, Transportation, Communications, Electric, Gas, And Sanitary Services with 15.7% and lastly the biggest: Wholesale Trade with 29.2%.

**Table 1: Overview of SMEs by SIC Code**

SIC	Industry	# of SMEs	% of SMEs
01-09	Agriculture, Forestry, And Fishing	114	3,4%
10-14	Mining	32	1,0%
15-17	Construction	338	10,1%
20-39	Manufacturing	828	24,6%
40-49	Transportation, Communications, Electric, Gas, And Sanitary Services	527	15,7%
50-51	Wholesale Trade	981	29,2%
52-59	Retail Trade	206	6,1%
70-79	Services	337	10,0%
	Total	3363	100,0%

Winsorizing<sup>6</sup> handles the problem of outliers in a distribution of data. According to Reifman and Keyton (2010) winsorizing gives the distribution more desirable statistical properties. They argue that there are at least two good reasons to winsorize; prevention of the presence of an outlier to have a disproportionate influence on statistical analyses and to ensure a strong statistical efficiency of parameters as they tend to take on similar values from repeated samplings. According to Reifman and Keyton (2010) Pearson correlation and according to Pallant (2005) multiple regression are very sensitive to outliers. Therefore the data will be winsorized according to Rahaman (2011) at the 1<sup>st</sup> and 99<sup>th</sup> percentile of distribution.

#### 3.2 Variable definition

##### 3.2.1 Dependent variables

Delmar (1997) distinguishes similar growth indicators in the empirical literature. Some of them are turnover/sales growth, employment growth, market share growth or assets growth. However, according to Teruel-Carrizosa (2006), even though these indicators are highly correlated, they do not react so quickly to internal or external changes. Therefore according to Kimberley (1976) and Penrose (1959) the best measure for size or growth of a firm is the number of employees. Not considering the growth in labor productivity is the only problem with using the number of employees (Teruel-Carrizosa, 2006). Therefore I will make a second calculation with the total asset growth as the dependent variable, since this dependent variable takes into account changes in labor productivity and this variable is also most apparent in my dataset, meaning it can best be used as a second measure of growth. The approach of taking these two

<sup>5</sup> Micro-enterprises are enterprises with under 10 employees and a revenue of under €10 million (Mkb servicedesk, 2018).

<sup>6</sup> Winsorization is the conversion of the value(s) of data points that are outlyingly high to the value of the highest data point not considered to be an outlier.

**Table 2: Overview of the variables**

Variable	Definition
<i>Dependent variables</i>	
Growth_A	Annual change in natural logarithm of total assets
Growth_E	Annual change natural logarithm of number of employees
<i>Independent variables</i>	
EBIT <sub>a</sub>	EBIT divided by total assets
RoA	Annual return on assets which is net income divided by total assets
B_Credit	Short-Term Bank Loans divided Total Liabilities.
D_Ratio	Leverage which is calculated by dividing the total debts by the total assets
<i>Dependent variables</i>	
Age	Natural logarithm of years of existence of company
Size	Natural logarithm of annual total assets
C_Ratio	Ratio of liquidity which is calculated by dividing the current assets by the short-term debts.
DummyCrisis	A dummy variable which equals 1 for the years 2009-2012 and 0 for the years 2013-2015.

dependent variables is also supported by Rahaman (2011), as he takes these two dependent variables in determining the growth. According to, for example Rahaman (2011) or Gopinath (2012), the size of a firm can be determined by taking the natural log differences of the size. This means employee growth ( $Growth\_E$ ) =  $\log(\text{number of employees}_{it}) - \log(\text{number of employees}_{it-1})$  and asset growth ( $Growth\_A$ ) =  $\log(\text{total assets}_{it}) - \log(\text{total assets}_{it-1})$  where  $i$  is the specific firm in time  $t$  (Rahaman, 2011).

### 3.2.2 Independent variables

#### 3.1.2.1 Internal financing

Internal financing can be measured through cash flow (Investopedia, 2018). Cash flow is the net amount of cash and cash-equivalents being transferred into and out of a business (Investopedia, 2018). Since cash flow is not available in the dataset, we can use the EBIT, which stands for Earning Before Interests and Taxes. Molinari, Giannageli and Fagiolo (2016) argue that the cash flow/EBIT should be divided by the total assets to make up for the potential correlation between cash flow/EBIT and other measures of firm size.

To measure economic profit, return on assets is used (Rahaman, 2011). This is a measure of performance which is calculated by dividing the net income by the total assets<sub>it-1</sub>.

#### 3.1.2.2 External financing

To measure a firm's access to the external credit market, a measure of bank credit facility can be used according to Sufi (2009). Sufi (2009) argues that the access to a bank credit facility is a good measure of a firm's external financing constraints. According to Sufi and Roberts (2009) it is a better measure than the traditional investment-cash-flow sensitivity measure. Following Rahaman (2011) we can determine this measure of access to bank credit facility as follows: short-term bank loans divided by total liabilities. In doing so I take short-term bank-loans as short-term loans since most of SMEs loans come from bank loans (Beck, Demirgüç-Kunt & Maksimovic, 2005).

The second measure is the debt ratio or debt-to-assets ratio. This is a financial ratio that measures the extent of a firm's leverage. It can be interpreted as to which extent a firm's assets are financed by debt. The formula is: total debt/ total assets.

### 3.2.3 Control variables

The regression analysis includes a number of control variables to account for the firm's characteristics.

Age is considered to have an influence on firm growth. Evans (1987) argues that older firms tend to grow slower and therefore age can be considered as having a negative influence on firm growth. On the other hand Diamond (1989) argues that the older firms are, the more likely they are to acquire a loan and the lower the borrowing costs are and according to Beck, Demirgüç-Kunt and Maksimovic (2005) this leads to higher growth. Since Beck et al. (2005) find that smaller firms do grow quicker when they can easily get access to capital, age can be expected to be a negative predictor for SME growth. For age I use the logarithm of years of existence<sub>it-1</sub>.

To account for the internal liquidity, to generate cash from sales, the current ratio is calculated by dividing the current assets by the short-term debts.

Size is often mentioned as one of the key determinants of growth of firms. Many researchers have found a negative relationship with the size and growth. This means when the firm size increases the growth rate decreases (Hall, 1987; Evans, 1987a, 1987b, Mata, 1994; Bechetti and Trovato, 2002). But on the contrary many have found no relationship between size and growth rate (Gibrat, 1931). Other researchers found that Gibrat's law holds. (e.g. Wagner, 1992; Kumar, 1985).

I use a logarithm of the firm's total assets from its balance sheet to determine the size of the firm. This measure is used in many growth researches using regression analyses (Rahaman, 2011; Ferrando & Mulier, 2013).

To account for the crisis period, a dummy variable is inserted which equals 1 for the years 2009-2012 (crisis) and 0 for the years 2013-2015 (post-crisis).

## 3.3 Data analysis

### 3.3.1 Regression equation

Following Rahaman (2011) the equation of the regression has the form of:

$$Y_{it} = \alpha + Z_{it-1} + X_{it-1} \epsilon_{it}$$

I will follow the approach of Rahaman (2011). Where  $i$  is the specific firm in time  $t$  and where  $Z_{it-1}$  is the set of variables depicting the various sources of external financing the firm  $i$  has access to.  $X_{it-1}$  is the set of firm characteristics control variables and  $\epsilon_{it}$  is the error term in the regression (Rahaman, 2011). The variables will consist of control variables, independent variables and the dependent variable. The control variables will be the

**Table 3: Summary of descriptive statistics for full sample**

	No of obs.	Min	Max	Mean	Median	Std. Dev.
Growth_A	18262	-1.272	1.533	.020	.016	.266
Growth_E	12799	-1.078	1.056	.009	.017	.185
EBIT <sub>a</sub>	18692	-12.890	14.029	.045	.049	.328
RoA	18707	-23.035	38.267	.023	.031	.569
B_Credit	21689	.047	1.218	.723	.806	.268
D_Ratio	22217	-10.236	324.168	.911	.569	4.585
Age	6871	1.098	4.948	3.087	3.091	.832
Size	21418	2.642	5.258	3.953	3.912	.408
C_Ratio	23541	-736.158	14006.038	5.367	1.317	125.570

All variables as defined in table 2. No of obs. is the number of observations. Std. Dev. is the abbreviation for standard deviation.

firm's characteristics (e.g. age, size, dummy variable for the crisis). The independent variables are about the way of financing, in this case we have internal and external ways of financing. The external financing is going to be measured by measuring the total debt of a company and I consider that as external financing. With these control variables and independent variables, I am going to use one model with two ways to measure size.

One being for the number of employees as dependent variable and the second one for total assets. More specifically:

$$\text{Growth}_{it} = \alpha + \beta \text{EBIT}_{it-1} + \beta \text{RoA}_{it-1} + \beta \text{B\_Credit}_{it-1} + \beta \text{D\_Ratio}_{it-1} + \beta \text{Age}_{it-1} + \beta \text{Size}_{it-1} + \beta \text{C\_Ratio}_{it-1} + \beta \text{Dummy Crisis} + \varepsilon_{it}$$

The first time growth will be measured as asset growth: Growth\_A. The second time growth will be measured as employee growth: Growth\_E.

### 3.3.2 Assumption checking

The assumptions for the multiple regression will be checked according to Pallant (2005).

Multicollinearity can be checked by looking at the tolerance level. A tolerance level of under 0.1 should be considered as a warning sign and a VIF value of over 10 also. The normality plot should be a reasonably straight diagonal line from the bottom left to the top right. The scatterplot must be concentrated in the center with a rectangular shape, showing that the data is homoscedastic. This is according to Pallant (2005).

## 4 RESULTS

### 4.1 Empirical findings

I removed extreme outliers by winsorizing the data at the 1<sup>st</sup> and 99<sup>th</sup> percentile as according to Rahaman (2011). The tolerance level of this dataset is at least 0.565 or higher, the VIF values are all under 10 (see table 8 in appendix 8.2) and none of the independent variables are highly correlated (table 5). Therefore multicollinearity is not an issue. The normality plot is a reasonably straight diagonal line from the left bottom to the right top, so the dataset is normally distributed. Lastly, the scatterplot is concentrated in the center and scattered somewhat along it, like a shotgun, so the data is homoscedastic. Endogeneity<sup>7</sup> can be checked by looking at the fixed effect model (Roberts & Whited, 2012) in appendix 8.3 table 9. For Growth\_E the coefficients of the linear regression and the fixed effect are relatively the same. However, for Growth\_A endogeneity seems to be apparent. The coefficients of the fixed effects are all more positively related to

Growth\_A than for the linear regression coefficients (EBIT<sub>a</sub>, B\_Credit, D\_Ratio, Size). So, some variables are interacting with the error term, which negatively influences the effect they have on Growth\_A.

#### 4.1.1 Summary of descriptive statistics

A univariate analysis was executed to obtain the descriptive statistics for the variables for the full sample, presented in table 3. The first thing that comes to mind is the difference in growth for employees and assets. They display an annual growth of 0.9% and 2% respectively. According to the OECD (1997) this is due to the fact that SMEs are still developing their productivity and outperforming firms with lower productivity. Thus, the employment of SMEs exceeds their share in value added, meaning that their value added per employee is lower in smaller SMEs than in larger SMEs. It can also be explained by the fact that the dataset contains more manufacturing firms than service firms which are more capital-intensive than labor-intensive (Janssen, 2009). These findings are in line with the findings of Rahaman (2011). He finds in his sample a growth of employment by 3.2% per year associated with a growth of sales of 6.1% per year for small firms and he finds this ratio to be even more extreme for medium-sized firms.

Table 4 describes the variables but differentiates the crisis and the post-crisis from the full sample. In table 4 the means of Growth\_A and Growth\_E are respectively, 2.6% and 1.2% for the crisis period (2009-2012). This growth is supported by Peric and Viteciz (2016) who conclude that Croatian SMEs grew during the times of crisis.

That the firms in my dataset still grow, despite being in an economic recession is in line with the findings of many researchers (e.g. Peric and Viteciz, 2016; Notta and Vlachvei, 2014; Tan, 2008). Peric and Viteciz (2016) find growth for Croatian manufacturing and service industries in times of recession. Notta and Vlachvei (2014) find growth for Greek food manufacturing firms during recession and Tan (2008) find this for companies from 8 different Asian countries.

SMEs are highly dependent on bank finance (Beck, Demirgüç-Kunt & Maksimovic, 2005). The external financing is defined by the bank credit ratio (B\_Credit) and the debt-to-asset ratio (D\_Ratio). As presented in table 3, both are quite high. Often, a debt-to-asset ratio of above 0.60 is considered a bad sign (Investopedia, 2018). In my dataset the average is 0.91, which is

<sup>7</sup> Endogeneity is a correlation between the explanatory variables and the error term in a regression (Roberts & Whited, 2012).

**Table 4: Summary of descriptive statistics for crisis and post-crisis**

	Crisis			Post-crisis			Difference crisis and post-crisis
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	%Δ Mean
Growth_A	.026	.016	.027	.009	.015	.261	-65,4%
Growth_E	.012	.017	.185	.003	.019	.184	-75,0%
EBIT <sub>a</sub>	.043	.047	.320	.048	.051	.339	11,6%*
RoA	.022	.029	.416	.025	.035	.731	13,6%*
B_Credit	.719	.798	.264	.730	.821	.273	1,5%*
D_Ratio	.874	.708	3.776	.960	.681	5.482	9,8%*
Age	3.050	3.045	.859	3.136	3.135	.791	2,8%*
Size	3.955	3.909	.400	3.949	3.917	.420	-0,2%
C_Ratio	5.051	1.302	139.901	5.790	1.341	103.316	14,6%*

\* Difference in mean is significant at 5%. All variables defined as in table 2.

well above what is considered healthy. This means that the firms have too much debts compared to their assets.

The difference between the mean and the minima and maxima of the variables are pretty normal. There is some difference but not out of the ordinary. They are comparable to Honjo and Horada (2006). I used RoA as a mean of measuring internal financing. The average RoA of my data sample is 2.3% during the crisis and post-crisis period. According to CSIMarket (2018) the average RoA in 2017 and 2018 is 2.5%. So the RoA I found during the crisis and post-crisis period is comparable to what it normally is. The contrast of internal financing with bank financing (B\_Credit) and the debt-to-equity ratio is enormous. This can be explained by the fact that the Dutch system is bank-based combined with the fact that SMEs are very dependent on bank finance (Beck, Demirgüç-Kunt & Maksimovic, 2005). As presented in table 4, the RoA for 2009 is 2.2% during the period of crisis and 2.5% during the period of post-crisis. This means in this period of crisis and post-crisis, the amount of internal financing did not really change.

The growth for the period of post-crisis (2013-2015) is respectively 0.9% and 0.03% for asset growth and employee growth. The difference, however, between the means of post-crisis and crisis for Growth\_A and Growth\_E is not statistically significant, so conclusions based on this difference cannot be drawn. The mean and median of the respective variables are pretty alike (table 3), this in an indicator of robustness. As presented in table 4 for the sub-samples crisis and post-crisis, the mean and median for the variables are relatively the same. That holds for the means and medians compared over time during the crisis and post-crisis period, as well. All of these are indicators of robustness.

#### 4.1.2 Pearson correlation matrix

The Pearson correlation matrix is displayed in table 5. This matrix includes the Pearson correlation coefficients which represent the linear correlation between two variables. The linear correlation between Growth\_A and Growth\_E is statistically significant (.269). EBIT<sub>a</sub> seems to correlate significantly with Growth\_A (.043) as well as with Growth\_E (.153). So an increase in growth is often accompanied by an increase in EBIT<sub>a</sub>. The means of internal financing, RoA, seems to correlate significantly with Growth\_E (.153) but not with Growth\_A. RoA

remains stable during the period from crisis to post-crisis while Growth\_A decreases significantly to almost 0. This essentially means that the assets and the return on assets remain stable during the post-crisis period. B\_Credit and Growth\_A are significantly correlated (.043). Age correlates significantly negatively with both Growth\_A (-0.044) and Growth\_E (-0.094). This means that older firms tend to grow slower than younger firms. These negative correlations support Janovic (1982) findings. He argues that the growth rate of a firm decreases as the age of the firm increases, when size is held constant. Size also significantly correlates with both Growth\_A and Growth\_E. However, it correlates negatively with Growth\_A (-0.079) and positively with Growth\_E (0.30). It is often argued that size negatively influences growth (e.g. Hall, 1987; Evans, 1987a, 1987b, Mata, 1994; Bechetti and Trovato, 2002), but we cannot make conclusions on this for growth in its entirety. Some of the independent variables also correlate, as expected since some of them measure the same concepts. The strongest correlation we see is between RoA and EBIT<sub>a</sub> (0.648), as they both measure internal financing. This is pretty high, but the VIF values are still significantly under 10 (table 8, appendix 8.2) so multicollinearity is not an issue. D\_Ratio and EBIT<sub>a</sub> (-0.292) and D\_Ratio and RoA (-0.280) also significantly negatively correlate. This means that bank lending decreases when internal financing becomes more available. This is an indicator that SMEs prefer to finance growth internally and that the pecking order theory holds.

#### 4.1.3 Regression results

Table 6 presents the regression results for the employee growth (Growth\_E) in models 1, 1a, 1b, 3, 3a, 3b, 5, 5a and 5b and table 7 in appendix 8.1 presents the regression results for the asset growth (Growth\_A) in models 2, 2a, 2b, 4, 4a, 4b, 6, 6a and 6b. To ensure a clear overview of this paper, the regression results for Growth\_A can be found in appendix 8.1. The model of Growth\_A is displayed in the appendix since the value for the adjusted R-squared<sup>8</sup> is lower. Both tables (table 6 and table 7 in appendix 8.1) include the regression results for both the full panel, for the crisis period and for the non-crisis period. The regression analyses for Growth\_A and Growth\_E are very similar except for one significant difference: the interaction of B\_Credit with the growth and its significance. B\_Credit has a significant effect on Growth\_A, but not on Growth\_E. This

<sup>8</sup> Adjusted R-squared measures the proportion of variation in the dependent variable explained by the independent variables for a

linear regression model adjusted based on the number of independent variables.



**Table 5: Pearson correlation matrix**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Growth_A	1	-	-	-	-	-	-	-	-
(2) Growth_E	.269**	1	-	-	-	-	-	-	-
(3) EBIT <sub>a</sub>	.043**	.153**	1	-	-	-	-	-	-
(4) RoA	.013	.105**	.648**	1	-	-	-	-	-
(5) B_Credit	.043**	.014	.069**	.052**	1	-	-	-	-
(6) D_Ratio	.028**	-.016	-.292**	-.280**	-.017*	1	-	-	-
(7) Age	-.044**	-.094**	.046**	.033*	.063**	-.074**	1	-	-
(8) Size	-.079**	.030**	.044**	.046**	-.146**	-.083**	0.030*	1	-
(9) C_Ratio	-.003	.001	.004	.003	.011	-.005	-.003	-.001	1

\* Significance at the 5% level. \*\*Significance at the 1% level. All variables as defined in table 2.

might be due to the fact that the additional borrowings are normally used to purchase new assets instead of new employees.

The assumptions for regression were checked and none were violated, according to Pallant (2005). The tolerance level of this dataset is at least 0.565 or higher, none of the independent variables are highly correlated and the VIF values are all under 10 (see table 8 in appendix 8.2), therefore multicollinearity is not an issue. The normality plot is a reasonably straight diagonal line from the left bottom to the right top, so the dataset is normally

distributed. Lastly, the scatterplot is concentrated in the center and scattered somewhat along it, like a shotgun, so the data is homoscedastic. The adjusted R-squared values for both the tables with Growth\_A or Growth\_E as dependent variable differ considerably. They are both quite low so the values are very scattered around the regression line. The adjusted R-squared for Growth\_E is considerable higher than for Growth\_A, which means that the model with Growth\_E as dependent variable explains more variance in firm growth. Since the regression analyses both have low R-squared values, they are both not useful when you want to make precise predictions.

#### 4.1.3.1 Firm growth and the financial crisis period

According to table 4, SMEs do grow during the period of crisis and post-crisis. The values for growth between crisis and post-crisis cannot be compared, since the difference in the means is not statistically significant. Size significantly negatively influences Growth\_E during the post-crisis and Growth\_A during the crisis. Size has a significant impact on Growth\_A and Growth\_E for the full sample. This supports the findings of Dunne et al. (1988), Evans (1987a,b) and Janovic (1982) that size has a negative effect on SME growth.

The results indicate that Dutch independent SMEs were able to grow during the period of crisis. This can be seen by the positive values for Growth\_A and Growth\_E during the period of crisis and post-crisis. This is in line with Peric and Viteciz (2016), Notta and Vlachvei (2014) and Tan (2008). They all find that firms do grow during periods of crisis.

#### 4.1.3.2 Internal financing and firm growth

The growth is influenced by the EBIT<sub>a</sub> in all models (table 6 and 7). The influence of EBIT<sub>a</sub> on growth fluctuates between .053 and .175 in all models and is significant. For model 1 and model 2 the effect on firm growth is .086 and .055, respectively. The effect increases during the period of crisis for both models (displayed in model 3 and 4).

Growth is also influenced by RoA, the other mean of measuring internal finance. RoA seems to have a stronger influence on Growth\_E than on Growth\_A and it exercises more influence during the period of crisis than during the period of non-crisis.

The effect of RoA negatively influences the growth during the period of crisis. This is because, as firms grow, they have to invest. In case firms finance this internally it results in a decline of the RoA. Also does the amount of assets increase which can also lead to a decreased RoA. As is presented in model 3, Dutch SMEs do finance their growth through internal financing during the period of crisis and somewhat during the post-crisis period (model 5). So the results illustrate that internal financing is important for SME growth, this is in line with Peterson (2002) and Rahaman (2011) and He and Ausloos (2017). He and Ausloos (2017) find that SMEs choose internal financing first.

#### 4.1.3.3 Bank financing on firm growth

D-Ratio, which represent total debt divided by total assets, seems to have a pretty significant relationship with Growth\_A and Growth\_E except for model 1a and 4. However, this relationship is very weak. Furthermore B\_Credit, which is the short-term bank loans divided by the total liabilities has a more interesting relationship with Growth\_A. It has an insignificant effect on Growth\_E in every model, but a significant effect on Growth\_A on model 2, 2a, 2b, 4, 4a, 4b and 6b. This effect fluctuates between .031 and .050. Thus, the effect of short term bank loans on Growth\_A was stronger and more significant during the crisis than during the post crisis. These findings suggest that getting more short-term bank loans has a positive effect on Growth\_A during the period of crisis. This dependence on bank-loans is in line with the findings of Beck, Demirgüç-Kunt & Maksimovic (2005) as well as with Liu and Li (2001) and Cheng and Degryse (2006) who finds that bank loans spur growth. Getting short-term bank loans seems to have no significant effect on Growth\_E.

#### 4.1.3.4 Pecking order theory and financing

During the crisis both the EBIT<sub>a</sub> and RoA have a significant and relatively large effect on firm growth. The positive effect of EBIT<sub>a</sub> (.175 in model 3) indicates that the firm is making money which enables it to invest. For the full panel of Growth\_E and Growth\_A the effect is .086 and .055, respectively. The effect is larger during the crisis and is lower during the post-crisis. The effect of RoA is also stronger during the crisis. For model 3 and 4 the effect is -.073 and -.039, respectively. This negative effect means that firms finance growth internally which suppresses their RoA. Both the internal financing measure mean results indicate that internal financing has a positive effect on firm growth. Thus confirming the first hypothesis.

As can be found in table 6, the D\_Ratio and EBIT<sub>a</sub> (-.292) and D\_Ratio and RoA (-.280) significantly negatively correlate. This means that when internal financing becomes more available, bank lending decreases. This indicates that Dutch SMEs prefer to finance growth internally and thus that the pecking order theory holds. The evidence shows that firms prefer to finance

**Table 6: Regression results for Growth\_E**

Model	Panel A: Full sample			Panel B: Crisis (2009-2012)			Panel C: Post-crisis (2013-2015)		
	1b	1a	1	3b	3a	3	5b	5a	5
EBIT <sub>a</sub>	.085***	.087***	.086***	.168***	.174***	.175***	.054***	.054***	.053***
RoA	.005	.005	.005	-.069***	-.072***	-.073***	.020***	.021***	.021***
B_Credit	.002	.006	.009	.005	.009	.011	-.001	.002	.007
D_Ratio	.001***	.001	.001*	.002***	.002*	.002*	-.002***	-.002**	-.002**
Age	-	-.022***	-.023***	-	-.026***	-.026***	-	-.015**	-.015**
Size	-	-	.013*	-	-	.008	-	-	.025*
C_Ratio	-	-	.000	-	-	.000	-	-	.000
Constant	.002	.069***	.014	.001	.076***	.043	.003	.047***	-.056
Adj. R <sup>2</sup>	.024	.033	.034	.029	.041	.041	.035	.037	.039

\* Significance at the 10% level. \*\* Significance at the 5% level. \*\*\* Significance at the 1% level. Model 1 presents the overall models and 1a-5b are sub-models. All variables as defined in table 2.

growth internally, so the first step of the pecking order theory holds during the period of crisis. Whether this is also true for the period of post-crisis cannot be concluded with certainty, since the effect of EBIT<sub>a</sub> is weaker during that period and RoA is slightly positive (.021) for Growth\_E and not significant for Growth\_A. This supports the findings of Degryse, de Goeij and Kappert (2012), Ang (1991), Holmes and Kent (1991) and Leary and Roberts (2004). I can conclude that Dutch independent SMEs prefer to finance growth internally during the financial recession, which is according to the pecking order theory, confirming hypothesis 2.

#### 4.1.3.5 Access to finance and firm growth

As can be found in table 4, the firms in my dataset do grow during the period of crisis and post-crisis, respectively 2.0% per year for Growth\_A and 0.9% per year for Growth\_E. The access to finance, seems to hardly change during the period of measurement. The internal as well as the external financing measurements remain stable, but the access to external finance as in the form of bank loans, is insignificant. The mean of EBIT<sub>a</sub> changes from .043 to .048, the mean of RoA changes from .022 to .025,

B\_Credit from .719 to .730 and D\_Ratio from .874 to .960. So, internal financing increases somewhat but remains low and bank financing remains relatively stable. The change in growth rate, however, decreases during the period of crisis and post-crisis but is insignificant according to my findings presented in table 4. The effect of EBIT<sub>a</sub> and RoA is pretty strong on Growth\_E and especially during the crisis period, .175 for EBIT<sub>a</sub> and -.073 for RoA. So internal finance seems to have a pretty strong and significant effect on Growth\_E, especially during the crisis period. The same holds for Growth\_A, with respectively .082 for EBIT<sub>a</sub> and -.039 for RoA.

## 5. SUMMARY AND CONCLUSION

In this paper, my attempt was to provide a review of the literature on SME growth and its determinants and empirically explore the relationship between means of financing on firm growth measured by change in asset growth and employee growth with the effects of the 2009-2011 financial crisis.

SMEs represent 99% of all enterprises and are considered very important for economic development. SMEs have contributed significantly to employment growth, output, promotion of exports and fostering entrepreneurship. It is often claimed that SMEs were deprived of required bank loans during the financial crisis and that this negatively affects their growth since they are heavily reliant on bank loans to finance growth. The growth of SMEs is measured in 2 different concepts in this thesis: growth

of employees (Growth\_E) and growth of total assets (Growth\_A). Financing methods is differentiated into internal and external finance. The research question is: Do SMEs finance their growth through internal financing during the financial crisis and post-crisis due to a decrease in access to capital? They do finance their growth internally, since the results show that this is the most important financing source. However, this is not due to a decrease in external finance, since this remains stable over the period of measurement.

The data sample is derived from Reach and includes 3363 Dutch independent SMEs. The period in which data from these SMEs is analyzed is from 2009 to 2015. This sampling period makes it possible to analyze these firms during the crisis and post-crisis. I used the period from 2009-2012 as the crisis period and 2013-2015 as the post-crisis period. The univariate analysis presented in table 4, shows that Growth\_A (.020) and Growth\_E (.009) are still positive during the period of crisis and post-crisis, which means that the SMEs still have an annual growth of assets of 2% and 0.9% for employment during that period.

Bank financing seems to be not very important to finance growth for the Dutch SMEs during the period of crisis and post-crisis. However, internal financing seems to be more important to finance growth, especially during the years of crisis.

So, it turns out that Dutch independent SMEs do grow during the crisis and the post-crisis period and they do finance growth through internal financing. Especially during the crisis period. Internal financing has a positive effect on the growth of Dutch independent SMEs during the financial crisis and post-crisis and it is the most important form of financing to attain growth during this period. This effect is most likely even stronger than it seems in table 7, since this effect is negatively influenced by endogeneity. Furthermore Dutch SMEs also prefer to finance their growth internally, which is according to the pecking order theory. The results do not show that financing is a restraint on growth for Dutch SMEs.

### 5.1 Limitations and future research

The major limitation of this research is the fact that the model developed to research growth, is very bad at predicting growth. This is due to the low adjusted R-squared values. R-squared is a statistical measure of how close the data are to the fitted regression line. To make reasonable precise predictions, you need a higher R-squared value. Since I have statistically significant predictors, I can still draw important conclusions about how changes in the predictor values are associated with changes in growth. So this model can be used to analyze the factors that influenced growth during the crisis and post-crisis,

but not to make predictions. Also, the model for Growth\_A is influenced by endogeneity, which reduces the effect the independent variables have on asset growth. Next to that, only a limited number of predictors have been inserted into the dataset. Lots of variables could have been tested to explain and predict growth, which were not analyzed in this research (consider gender of CEO, owner type or industry type). For future research these variables can also be implemented in the model, to see whether these variables can explain more variation in firm growth.

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## 8. APPENDIX

### 8.1 Regression results for Growth\_A

Table 7: Regression results for Growth\_A

Model	Panel A: Full sample			Panel B: Crisis (2009-2012)			Panel C: Post-crisis(2013-2015)		
	2b	2a	2	4b	4a	4	6b	6a	6
EBIT <sub>a</sub>	.053**	.054***	.055***	.083***	.087***	.082***	.073***	.073***	-.005
RoA	-.009*	-.010	-.009	-.045***	-.047**	-.039*	-.005	-.005	.030
B_Credit	0.40***	.043***	.032**	.046***	.050***	.032**	.031**	.031	.003**
D_Ratio	.002***	.002***	.002**	.003***	.003**	.002	.003***	.003**	.000
Age	-	-.015***	-.014***	-	-.021***	-.020***	-	.000	-.007
Size	-	-	-.047***	-	-	-.070***	-	-	.000
C_Ratio	-	-	.000	-	-	.000	-	-	.009
Constant	-.013**	.031*	.244***	-.012	.049**	.336***	-.020**	-.019	.005
Adj. R2	.005	.007	.011	.006	.009	.019	.008	.006	.073***

\* Significance at the 10% level. \*\* Significance at the 5% level. \*\*\* Significance at the 1% level. Model 1 presents the overall models and 2a-6b are sub-models. All variables as defined in table 2.

### 8.2 VIF values for the variables

Table 8: Multicollinearity test using VIF values

EBIT <sub>a</sub>	1.769
RoA	1.752
B_Credit	1.032
D_Ratio	1.120
Age	1.011
Size	1.032
C_Ratio	1.000

Right column contains VIF values for the full sample. All variables as defined in table 2.

### 8.3 Fixed and random effects regression model

Table 9: Estimates and coefficients of effects

	Dependent variable: Growth_A			Dependent variable: Growth_E		
	Fixed Effects	Linear	(FE-LE) Difference	Fixed Effects	Linear	(FE-LE) Difference
EBIT <sub>a</sub>	.089***	.055***	.034	.100***	.086***	.014
RoA	.021	-.009	.030	-.041	.005	.046
B_Credit	.050***	.032**	.018	.018	.009	.009
D_Ratio	.019***	.002**	.017	-.005	.001*	.006
Age	-.009**	-.014***	.005	-.021***	-.023***	.002
Size	-.001	-.047***	.046	.014***	.013*	.001
C_Ratio	.000	.000	.000	.000	.000	.000

\* Significance at the 10% level. \*\* Significance at the 5% level. \*\*\* Significance at the 1% level. All variables as defined in table 2.