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WHAT FACTORS INFLUENCE AND DETERMINE THE CAPITAL STRUCTURE OF RETAIL COMPANIES IN THE US?

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Abstract: This work project analyses the relationship between financial leverage measures and the explanatory variables. Based on a sample of US retail companies for the period 2016-2019, the results show that profitability and liquidity have a negative influence on the total, short-term and long-term debt of US retailers. On the contrary, size and growth opportunities affect positively retailers' debt. Our main result is that the US retail sector is not debt driven and aligns with the pecking order theory.

Keywords: capital structure, key factors, retail industry, regression analysis

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1. Introduction

Until proven otherwise, no study addressing the determinants of US retailers' capital structure has been carried out. Because US companies disclose publicly corporate information such as financial data, the US market is an advantageous basis for our paper. Indeed, the collection of the right data sources is crucial to the success of our financial analysis. Moreover, retail sector's financial data present lower valuation problems than other industries and tend to be more visible. There is also more comparability across companies that enables us to access relevant peer and overall industry information.

The purpose of this paper is to explore and investigate the determinants of capital structure in the US retail industry for the period 2016-2019. To this end, we will focus on profitability, size, growth opportunities, and liquidity. Each one of these key factors will further be discussed in the literature review part. To achieve our goal, we investigate different results obtained from correlation and multivariable regression analyses. For consistency, this paper reports the results of the Pooled Ordinary Least Square (OLS), fixed effect (FE), and random effect (RE) models.

This paper proceeds as followed; section 2 reviews the literature addressing the determinants of capital structure and exposes the research hypotheses. Section 3 describes the methodology, sample and presents the data analysis concerning the variables of the research. Section 4 discusses the findings of the research which are based on the regression and multivariable regression models. Section 5 concludes and resumes the contributions of the research and makes suggestions for future investigation.

2. Literature review and formulation of research hypotheses

When considering capital structure, companies can be classified as levered and unlevered firms. Whereas unlevered firms only depend on equity or retained earnings to fund investment decisions, levered firms use debt, equity and retained earnings to finance their operations. In other words, capital structure is defined by the different types of funding sources available for

a company (Titman and Wessels 1988). The debate on capital structure started in 1958 with the two famous researchers Modigliani and Miller, who under perfect market conditions, argued that the total value of a firm should not depend on its capital structure. Since then, despite the fact that recent studies have demonstrated a more realistic approach to the importance of capital structure, the debate still remains unresolved and inconsistent. The two main theories identified in research studies of capital structure are the pecking order and trade-off theories.

Some researchers such as Kasozi (2018) and Abdou et al. (2012) have found some pecking order patterns in the financing choices of retail companies respectively in South-Africa and in United-Kingdom. The pecking order theory has been established by Myers in 1984. It supports that, since managers have more knowledge about the company's risks and value than outside investors, firms should rely on internal funds in the first place. Yet, if external funding is required, it is better to rely on debt rather than on equity.

Other researchers such as Rajan and Zingales (1995) or Chatterjee and Eyigungor (2020), have documented some trade-off patterns in the financing choices of US quoted companies. The trade-off theory has emerged with Kraus and Litzenberg in 1973. It mentions that the optimization of the firm's capital structure involves a trade-off between the costs of debt financing, such as financial distress costs, and the benefits of debt financing such as tax savings. It assumes that the optimal capital structure is reached when the present value of tax savings is just offset by increase in the present value of financial distress.

Both theories have been demonstrated in real case studies by various researchers. However, as companies' financing attitudes can simultaneously fit within multiple patterns, it is difficult to classify an industry sector based on one theory or another. Managers need to understand that the capital structure of a company is not only concerned with the ideal leverage ratio or the pursue of one theory or another, but also with the recognition of key factors as influencing the

management of leverage. Indeed, it exists complex relationships between the level of gearing and variables such as profitability, size, growth opportunities and liquidity, which play an important role in determining capital structure of US retail companies.

Profitability:

Profitability is critical to US largest retailers because they have a strong need to fund investments and make acquisitions. According to a research study conducted by Allianz, since 2008, one out of ten listed US retailers went bankrupt due to a decrease in profit margin. This recrudescence of bankruptcy especially occurred in the clothing and discount store sectors. One of the main reasons for this is the intensifying competition that deteriorate the profitability of US retail companies. Indeed, since 2015, this sector is driven by strong competition coming from the e-commerce segment.

The trade-off and pecking order theory have divergent conclusion regarding the relationship between firm leverage and profitability (Danis et al. 2014). According to the trade-off theory, there is a positive relationship between leverage and profitability because profitable companies have low bankruptcy cost and benefit from debt interest tax shield. Moreover, Alnori (2021), documented that compared to the pecking order model, the trade-off pattern is best suited for high profitable multinational companies. He argued that multinational firms' financing decisions are sensitive to factors related to the international business environment such as international taxation differences. Indeed, he mentioned that international taxation is cheaper compared to the US taxation and therefore companies take advantage on it. Other empirical studies conclude that there is a positive relationship between leverage and profitability (Kakanda, Bello and Abba 2016). Their results show that the leverage ratio (debt to equity ratio) is strongly and positively associated with all measures of profitability.

Indicating that excessive financing with debt negatively impacts profitability due to heavy interest payments, pecking order theory constitutes the opposite view. This theory argues that

profitable companies have enough internal reserves and therefore are not constrained to depend on external financing (Myers 1984). More precisely, external financing such as debt or equity are associated with information asymmetry problems. Shareholders or debtholders have less information regarding the company's performance as opposed to managers. In order to compensate for this risk, external lenders ask for higher return. This implies that debt interest tax shields benefits are less important than information asymmetry costs when making debt decisions. According to a research study conducted by Kasozi (2018), the South-African retail sector aligns with the pecking order theory because it relies more on retained earnings to generate profit. He found that all measures of debt were statistically significant but negatively correlated with profitability. Furthermore, Abdou et al. (2012), discovered that the pecking order theory holds for the UK retail sector's capital structure. These two findings mirror Rajan and Zingales (1995); Frank and Goyal (2009); Javed and Akthar (2012) and Muneer (2015) studies. Indeed, they found a negative relationship between profitability and leverage. It can be concluded that the debate is very open. However, the pecking order theory is empirically more prominent. Therefore, the following hypothesis is submitted:

H1a: Profitability is negatively related to leverage (LEV)

According to researchers such as Addae et al., (2013) short-term debt is positively correlated with profitability. They mentioned that short-term debt is less expensive than long-term debt and creates lower interest commitments. However, it's important to noticed that these studies have been conducted in Ghana where the long-term capital market is not much developed. Indeed, companies struggle to secure cheap long-term loans from the Ghanaian financial institutions. Moreover, using correlation and regression analysis, Kasozi (2018) observed that short-term debt negatively affects profitability. He mentioned that short-term debt alters profits in the long run because South-African retail companies have to pay regular interest payment. On the other part, long-term debt seems to be more advantageous. Thanks to

the use of long-term debt, companies are able to spread interest commitments over a longer period, reduce their financial risks and increase profits. It can also be observed that in our sample, US retail companies are mostly financed by long-term debt. As a consequence, the following hypotheses are presented:

H1b: Profitability is negatively related to short-term debt (LEV2)

H1c: Profitability is positively related to long-term debt (LEV3)

***Size*:**

According to the survey initiated by Graham and Harvey (2002), firm size plays an important role in the practice of corporate finance and is one of the most important determinants of financial leverage. The more a firm grows in size, the greater the influence on its stakeholders within and outside its operating environment is. It's also important to noticed that the impact of firms' size on financial leverage can vary according to the development of financial markets in a particular country. For example, Beck et al., (2005) investigated the effect of financial, legal, and corruption problems on firms' size . They showed that smallest firms are the most affected by such obstacles.

The relationship between firm size and financial leverage has been defined by many capital structure theories. The trade-off theory indicates that there is a positive relationship between size and leverage whereas the pecking order theory proposes otherwise. Recent studies continue to test this relationship; some go along with the former while others are better off with the latter.

Rajan and Zingales (1995) are among the earliest researchers to confirm a positive relationship between size and leverage. A possible explanation is that larger firms are more diversified, have higher capacity to meet up with interest payments and have lower probability of going bankrupt which allow them to take on more leverage. Moreover, Abdou et al. (2012) confirmed a positive relationship between size and leverage in both the full and stepwise

regression. They mentioned that larger firms are less risky, have lower asymmetric information for creditors and have higher collateral value compared to smaller one. More recently, Chatterjee and Eyigungor (2020) concluded that larger firms have higher debt in their capital structure. Indeed, they argued that US quoted firms have higher investment opportunities and higher need for cash, and so, their needs for banking loans increase.

However, some researchers reported a negative relationship between size and financial leverage. The study of Ezeoha (2008) has found some pecking order patterns in the financing choices of Nigerian quoted companies. Using a fixed effect panel regression, he discovered that size is negatively and significantly related to financial leverage. Other researchers such as Faulkender and Petersen (2006) observed that larger firms have more access to the equity market compared to smaller ones. One of the main reasons could be that larger firms benefit from reputational advantage towards investors. Therefore, they may foster this opportunity rather than financing their operations through debt instruments. Another element could be that smaller firms have less access to the equity market and therefore use more debt to finance their operations. Therefore, larger companies have less debt available and are forced to go to the equity market (Ramalho and Da Silva 2009). It can be concluded that the debate concerning pecking order and trade-off remains vague and ambiguous. However, most of the researchers that found a negative relationship between size and leverage were working on underdeveloped capital markets wherein the access to external financial market is very difficult. On the contrary, US retail companies benefit from great accessibility to the external capital market. Moreover, as the trade-off remains empirically dominant in the last recent studies, the following hypothesis for the US retail sector is proposed:

H2a: Size is positively related to leverage (LEV)

The relationship between short-term and long-term debt with company's size remains also unclear. Yet, as previously mentioned, larger firms experience less difficulties related to

bankruptcy risks and information asymmetry. This leads to lower monitoring and residuals costs for external financing and therefore it increases their ability to borrow long-term debt (Ohman and Yazdanfar 2015). As opposed to large firms, small ones are considered riskier by investors. In order to minimize the impact of problems related to information asymmetry small companies tend to use as much as possible short-term debt in their capital structure (Danilevskaia 2005). Finally, fast-growing economies such as the United-States increase the access of larger firms to long-term debt. Therefore, the following hypotheses are formulated:

H2b: Size is negatively related to short-term debt (LEV2)

H2c: Size is positively related to long-term debt (LEV3)

Growth Opportunities:

According to researchers in the field of corporate finance, growth opportunities are a significant determinant of capital structure. The relationship between leverage and growth opportunities has been discussed and explained by all the mainstream theories of capital structure. The empirical evidence regarding this relationship is rather mixed (Bevan and Danbolt, 2002).

Awan et al. (2010) found an overall significant positive relationship between growth opportunities and leverage. Indeed, they concluded that companies view growth opportunities as unsustainable. Therefore, they may prefer to use debt to finance such growth in order to transfer the risk on debtholders rather than on stockholders. Moreover, according to Chen and Zhao (2006), firms with high growth opportunities have lower risks of bankruptcy and are more profitable they, then, face lower borrowing costs. Hence, its profitable for them to finance growth with debt. Finally, Daskalakis and Psillaki (2005) mainly approved that growth opportunities are negatively correlated with gearing. However, they mentioned that in some situations firms with high growth opportunities are going to make use of the entire amount of retained earnings and require additional capital such as debt to finance new projects.

Against these findings, the agency theory revealed us that tensions between shareholders and lenders increase when companies have high growth opportunities (Cheng and Shiu 2007). The underinvestment problem is the perfect example. Indeed, there is a tendency of equity holders to pass up positive NPV investments when the firm's existing debtholders are expected to capture most of the benefits. Whereas any increase in firm value is shared between debtholders and shareholders, reducing the benefits of the equity holders, shareholders bear the whole cost of the project. Therefore, companies favour equity over debt to finance high growth opportunities because it is directly linked to the underinvestment problem (Awan et al. 2010). Moreover, managers and shareholders also have different perspectives. Shareholders are expecting to receive dividends whereas managers prefer to retain free cash flow. When companies have low growth opportunities, debt should be issued. Indeed, debt has a disciplining impact on the management because companies will have to pay regular interest payments, leaving managers with less amount of cash. Accordingly, the agency theory teaches us that companies with high growth opportunities may favour equity financing whereas companies with low growth opportunities may prefer debt financing. Therefore, a negative relationship between leverage and growth opportunities can be anticipated. Other researchers also highlighted such a negative relationship between leverage and growth opportunities. For example, Bevan and Danbolt (2002) regard growth opportunities as intangible assets that do not provide enough collateral, liquidation value and taxable income. They are considered riskier and their ability to pay regular interest is more uncertain. Hence, the level of gearing of companies with growth opportunities of such nature decrease. According to these arguments, the following hypothesis is tested:

H3a: Growth opportunities are negatively related to leverage (LEV)

For Myers (1984), firms having low level of gearing or using short-term debt are expected to better exploit growth opportunities which results in an increase of investments. Short-term

debt allows companies to become financially flexible as well as to make efficient investment decisions (Ding et al. 2020). For example, when companies are in a bad state, they can reduce their level of gearing. Also, companies can issue short-term debt that expires before a new investment opportunity. Short-term debt mitigates underinvestment problem in this kind of situation because it enables stockholders to gain the full benefit of the new project (Dang 2011). Finally, short-term debt enables companies to renegotiate and reprice the debt contracts throughout the project duration. As opposed to long-term debt that does not help firms to make efficient investment decisions and creates underinvestment problems. Therefore, the following hypotheses are submitted:

H3b Growth opportunities are positively related to short-term debt (LEV2)

H3c: Growth opportunities are negatively related to long-term debt (LEV3)

Liquidity:

The empirical evidence regarding the relationship between liquidity and leverage is also rather mixed and has been a source of debate since many years. Recent studies that address this relationship have demonstrated that while in some countries liquid firms are mostly financed by internal reserves, in others, the more liquid the firm is, the more debt it has in its capital structure (Harc and Sarlija, 2012). The pecking order theory and trade-off theory also have divergent conclusions.

Using data of US public companies, Sibilkov (2007) discovered that debt is positively related to liquidity. According to her study, companies that have liquid assets have more debt in their capital structure because they have enough reversible assets to pay their obligations towards debtholders. This finding mirror Panno (2003)'s study who found that firms with high quick ratio might be highly levered because they have a better ability to meet their financial obligations.

A contrary view is the pecking order theory supported by Deesomsak et al. (2004). Indeed, they mentioned that firms with higher quick ratio will borrow less. They also observed that managers have the possibility to manipulate liquid assets at the advantage of stockholders, increasing the agency cost of debt. Liquid assets also are a guarantee that in bad times or when it's difficult to access the external financial market, companies can remain competitive (Harc and Sarlija 2012). These arguments mirror Lipson and Mortal (2009)'s study who discovered that most liquid firms are mainly financed by their own capital and therefore less levered. The sample of their research study consisted of US companies listed on stock exchanges which is similar to the sample under investigation. Moreover, in order to keep consistency with the hypothesis regarding the relationship between profitability and leverage, the following hypothesis is articulated:

H4a: Liquidity is negatively related to leverage (LEV)

Many researchers have demonstrated a negative relationship between short-term debt and liquidity as both are substitute in times of lack of cash. Indeed, short-term borrowing reduces liquidity of firms (Anderson 2002). However, long-term levered firms are more liquid because they are able to increase liquid assets. For example, in Croatia, companies borrow money through long-term debt to increase their level of inventory as well as to buy raw materials and finished products (Harc and Sarlija 2012). As a consequence, the following hypotheses are proposed:

H4b: Liquidity is negatively related to short-term debt (LEV2)

H4c: Liquidity is positively related to long-term debt (LEV3)

3. Methodology

Pearson's correlation analyses and multivariable regression models are developed below. We decided to make use of three different multivariable regression models, the Pooled Ordinary Least Square (OLS), Fixed Effect (FE), and Random Effect (RE) ones. Their use aims at two purposes; first, the analysis and understanding of key factors' impact on the capital structure of US retail companies; second, the testing of the hypotheses set out previously.

Sample and data:

The data for this empirical research was collected from Compustat North America which is a database of US and Canadian active publicly held companies. The sample of this research consist of the top 100 US retailers according to sales. The analysis covers the periods between 2016 and 2019. The decision for not analyzing periods after 2020 is to prevent any influence from the COVID-19 crisis. Indeed, this crisis did not affect essential and non-essential US retailers in the same way. According to the Census Bureau, the sales of US clothing retailers dropped by 89,3% in 2020 whereas the sales of US grocery stores increased by 13,2%. Also, lockdowns and social distancing measures affected more retailers with physical stores than online retailers. That's why this analysis covers the last four most recent periods before the pandemic. The initial sample is composed of the 100 largest US retail firms (according to sales). Twenty-one companies were excluded because they are privately owned companies and therefore their stock is not publicly traded on a stock exchange. Additionally, another thirty-six companies were excluded because data was not available for the periods of the research. Therefore, the initial sample reduced to forty-three companies.

Variables:

We planned to apply multivariable regression models, using Stata' statistic software, to test our hypotheses, related to the dependent variables (LEV, LEV2, and LEV3), as a linear

combination of the independent variables. The relationships between financial leverage measures and the explanatory variables are presented below:

Equation 1: Total debt

$$LEV_{it} = \beta_0 + \beta_1\, PROF_{it} + \beta_2\, SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}$$

Equation 2: Short term debt

$$LEV2_{it} = \beta_0 + \beta_1\, PROF_{it} + \beta_2\, SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}$$

Equation 3: Long-term debt

$$LEV3_{it} = \beta_0 + \beta_1\, PROF_{it} + \beta_2\, SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}$$

Where LEV_{it} is the debt to assets ratio of firm i in year t; $LEV2_{it}$ is short-term debt ratio of firm i in year t; $LEV3_{it}$ is the long-term debt ratio of firm i in year t; $PROF_{it}$ is the return on assets of firm i in year t; $SIZE_{it}$ is the natural logarithm of sales of firm i in year t; $SGROW_{it}$ is the annual assets growth of firm i in year t; LIQ_{it} is the quick ratio of firm i in year t and ε_{it} is the error term of firm i in time t. The index "i" represents the cross-sectional dimension for US retail firms ranging from 1 to 43. The index "t" indicates the time-series dimension of years ranging from 2016 to 2019. Finally, β represents the coefficients associated with the independent variables.

Table 1: Definition and measure of applied variables

Variables	Acronym	Ratio	Measures
Dependent Variables			
Leverage	LEV	Debt to assets (DTA)	Total debt/Total assets
Short term debt	LEV2	Short term debt (STD)	Total short-term debt/Total debt
Long term debt	LEV3	Long term debt (LTD)	Total long term debt/Total liabilities
Independent Variables			
Profitability	PROF	Return on assets (ROA)	Net income /Total assets
Size	SIZE	Natural logarithm of sales per year (LSALES)	Natural log(sales)
Growth opportunities	SGROW	Annual assets growth (AAG)	[Total assets(t) - total assets(t-1)]/ total assets (t-1)
Liquidity	LIQ	Quick ratio (QR)	[Current assets - inventory - prepaid expenses] /current liabilities

Table 1 describes the financial ratios associated with the dependent and independent variables. We decided to adopt three measures of financial leverage which are total debt to total

assets (DTA), short-term debt to total debt (STD), and long-term debt to total liabilities (LTD). In the regression estimation all measures of financial leverage serve as the dependent variables, while the others are associated with the independent variables. To find the adequate measure for profitability, size, growth opportunities, and liquidity, we relied on the results of previous research studies discussed in the literature review part. We also tested the correlation between all debt variables and potential measures for the independent variables.

A measure of profitability (PROF) is calculated as the ratio of the firm's net income to total assets (ROA). Our decision to choose the return on asset ratio (ROA) instead of the return on equity (ROE) comes from the mistake made by Kasozi (2018) in his research studies. Indeed, the analysis with the ROE was weak across all estimations. Therefore, we decided to drop ROE from the analysis and to make use of ROA as the proxy for profitability.

A measure of size (SIZE) is calculated as the natural logarithm of sales per year (LSALES). Indeed, Ezeoha (2008), among others, does not completely agree to the use of logarithm of total assets as a proxy for size. He, instead, makes use of the logarithm of sales per year because this measure is highly correlated with leverage ratios. Moreover, he mentioned, that the size effect on leverage is nonlinear. Therefore, we decided to make use of the natural logarithm of sales per year as a proxy for size.

A measure of growth opportunities (SGROW) is calculated as the annual assets growth (ASG). This proxy is a good indicator of growth opportunities and is highly correlated with all measures of financial leverage (Abdou et al. 2012 and Kasozi 2018). Other measures such as annual sales growth, market to book value or R&D expenses, can be treated as a surrogate for growth opportunities.

Finally, a measure of liquidity (LIQ) is calculated as the quick ratio (QR). Both the quick ratio and current ratio are serious candidates to measure a firm's ability to meet its debt obligations. However, since most of the research studies addressing the relationship between

liquidity and leverage use the quick ratio (Harc and Sarlija 2012 and Abdou et al. 2012), we decided to pick it out as a proxy for liquidity.

4. Presentation of results and discussion

Summary statistics:

Table 2: Descriptive results of all variables over the 4-year period

Acronym	Ratio	Mean	Std. Dev.	Minimum	Maximum	Observations
Dependent Variables						
LEV	Debt to assets (DTA)	0,345	0,212	0,022	1,344	172
LEV2	Short term debt (STD)	0,078	0,090	0,000	0,483	172
LEV3	Long term debt (LTD)	0,415	0,162	0,030	0,747	172
Independent Variables						
PROF	Return on assets (ROA)	0,178	0,102	-0,313	0,413	172
SIZE	Natural logarithm of sales per year (LSALES)	10,029	1,484	6,246	13,146	172
SGROW	Annual assets growth (AAG)	0,119	0,253	-0,225	1,956	172
LIQ	Quick ratio (QR)	0,540	0,380	0,092	2,385	172

Table 2 reports summary statistics for the dependent and independent variables during the period 2016 and 2019. Of all the forty-three companies, the average debt to asset ratio is 0,345. It means that, on average, 35% of firms' assets are financed by debt. For some companies this value declines to 2%. These results imply that US retail companies are not highly levered. Moreover, the majority of their debt is of long-term nature: on average, 41,5% of firms' liabilities are financed by long-term debt. On the contrary, the short-term debt ratio indicates that around 1% of the forty-three retail firms' debt is short-term by nature. As noted by Ohman and Yazdanfar (2015), larger firms have less obstacles related to financial distress risks and information asymmetry problems. Therefore, since monitoring and residual costs decrease, it is easier for these companies to borrow long-term debt.

Correlation analysis:

Table 3,4,5 and 6 report the bivariate values of correlations between the dependent and independent variables using Stata.

Table 3 describes the correlations between the debt to assets ratio (DTA) and the independent variables (equation 1). From this table, it can be concluded that there is a statistically significant negative correlation between the measure of financial leverage and the indicator of liquidity (QR). This finding mirrors studies conducted by Harc and Sarlija (2012) or Lipson and Mortal (2009). It may be possible that US retail companies use their liquid assets as a guarantee both in bad times and when it is difficult to access the external financial capital markets. Moreover, the indicator of size (LSALES) also indicates negative but statistically significant correlation with the financial leverage measure (DTA). One of the main reasons could be that US retailers have good access to the equity markets and benefit from reputational advantage from investors as they are larger firms (Faulkender and Petersen 2006). This finding could explain why US retailers are not highly levered. Another element may be that smallest US companies have little access to the equity markets and finance their operations through debt instruments. Therefore, larger firms such as our sample, have less debt available on the capital market and are forced to go the

Table 3: Correlation results among LEV (DTA) and independent variables

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pwcorr DTA ROA LSALES AAG QR, sig
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	DTA	ROA	LSALES	AAG	QR
DTA	1.0000				
ROA	0.1118	1.0000			
p-value	0.1444				
LSALES	-0.1419^	-0.0033	1.0000		
p-value	0.0633	0.9659			
AAG	0.2304+	-0.0852	-0.0372	1.0000	
p-value	0.0024	0.2664	0.6282		
QR	-0.2072+	-0.1263	0.0049	0.0286	1.0000
p-value	0.0064	0.0988	0.9491	0.7092	

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels, respectively.

equity market (Ramalho and Da Silva 2009). Furthermore, the correlation between the measure of profitability (ROA) and financial leverage is positive, although this finding is insignificant. Finally, growth in the industry (AAG), indicates statistically significant positive correlation with the financial leverage measure. This finding mirror studies conducted by Chen and Zhao (2006) and Daskalakis and Psillaki (2005) who mainly approved that growth in the industry is highly and positively correlated with debt. Indeed, they argued that firms with higher growth opportunities face lower borrowing costs as they are on average more profitable and have lower financial distress risks.

Table 4 highlights the correlation between the short-term debt ratio (STD) and the independent variables (equation 2). As expected, short-term debt is negatively correlated with the indicator of profitability (ROA). As stated by Kasozi (2018), short-term debt alters profitability in the long run because retailers have to pay regular interest payments. Moreover, there is a statistically significant positive correlation between the short-term debt and the indicators of size and growth opportunities. Finally, the correlation between the indicator of liquidity with short-term debt is insignificant and negative.

Table 4: Correlation results among LEV2 (STD) and independent variables

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pwcorr STD ROA LSALES AAG QR, sig
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	STD	ROA	LSALES	AAG	QR
STD	1.0000				
ROA	-0.1096	1.0000			
p-value	0.1524				
LSALES	0.4537+	-0.0033	1.0000		
p-value	0.0000	0.9659			
AAG	0.0971	-0.0852	-0.0372	1.0000	
p-value	0.2050	0.2664	0.6282		
QR	-0.0507	-0.1263	0.0049	0.0286	1.0000
p-value	0.5089	0.0988	0.9491	0.7092	

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels, respectively.

Table 5 reports the correlation between the long-term debt ratio (LTD) and the independent variables (equation 3). From this table, it can be observed that long-term debt is statistically significantly correlated with the majority of the independent variables. More precisely, there is a statistically significant negative correlation between the indicators of size (LSALES) and long-term debt (LTD). The same is true for the indicator of liquidity (QR). Long-term debt of US retailers seems to negatively impact the liquidity of larger firms. As opposed to liquidity and size, growth in the industry is positively and statistically significantly correlated with long-term debt. Finally, the correlation between profitability and long-term debt is insignificant.

Table 5: Correlation results among LEV3 (LTD) and independent variables

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pwcorr LTD ROA LSALES AAG QR, sig
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	LTD	ROA	LSALES	AAG	QR
LTD	1.0000				
ROA	-0.0040	1.0000			
p-value	0.9588				
LSALES	-0.1770*	-0.0033	1.0000		
p-value	0.0202	0.9659			
AAG	0.2210+	-0.0852	-0.0372	1.0000	
p-value	0.0036	0.2664	0.6282		
QR	-0.1664*	-0.1263	0.0049	0.0286	1.0000
p-value	0.0291	0.0988	0.9491	0.7092	

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels, respectively.

Table 6 illustrates the correlation between short-term (STD) and long-term debt (LTD) with total debt measure (DTA). As expected, long-term debt is positively and statistically significantly correlated with total debt measure. Indeed, the majority of US retailers' liabilities are financed by long-term debt. As opposed to long-term debt, short-term debt is negatively correlated with total debt measure. In fact, only 1% of the forty-three retail firms' debt is short-term by nature.

From this first analysis, the following arguments can be drawn. First of all, growth opportunities are positively and significantly related to financial leverage. This indicates that

the highest growth opportunities are for US retailers, the most likely debt is used for financing new projects. The results are the same when short-term and long-term debt ratios are used as the dependent variables. As opposed to growth opportunities, liquidity in the US retail sector is negatively and significantly related to all debt measures (DTA, STD, LTD). This demonstrates that the more liquid US retailers are, the less likely debt is used as a financing option. Thirdly, size of retail firms is significantly negatively related to long-term debt and total debt measures whereas its positively significantly related to short-term debt. These findings indicate that, in a general manner, the size of a US retailer does not influence the likelihood for borrowing debt from financing institutions. Finally, profitability is negatively correlated with long-term and short-term debt measures although these findings are insignificant.

According to these arguments, US retail companies' financing attitudes can fit within multiple theories at the same time. For example, the relationships between size and debt measures indicate a trade-off pattern in the financing choice of US retail companies. As opposed to the relationships between liquidity and debt measures which signal a pecking-order pattern in the financing choice of US retail companies. Therefore, this paper illustrates the fact that it is difficult to classify US retail companies based on one theory or another. Managers should analyze and understand the key determinants of their capital structure to find the adequate amount of debt that will maximize firm value.

Further analyses to these findings are necessary as the Pearson's correlation analysis only measure the relationship between two variables and do not take into consideration the correlation of each variable with other independent variables. Therefore, this paper further evaluates multivariable regression models such as Pooled Ordinary Least Square (OLS), Fixed Effect (FE), and Random Effect (RE) ones. They are used to establish the relationship between a dependent variable and several independent variables.

Regression analysis:

First of all, it is important to theoretically introduce the Pooled Ordinary Least Square (OLS), Fixed Effect (FE), and Random Effect (RE) models. In the Pooled OLS model, time and individual dimensions are not considered. Hence, this model assumes that the behavior of corporate data is the same in various periods (Rizka 2022). The fixed effect model, on the contrary, is used when the goal is to analyze the impact of variables that vary over time (Rizka 2022). This model is designed to study the causes of changes within an entity. Finally, the random effect model, assumes that the variations across entities are random and uncorrelated with the independent variables (Rizka 2022).

In order to choose the best suited regression model for the panel data of each equation, this paper relies on Dougherty's process framework (table 7). The process has been performed for the panel data of equation 1, 2, and 3. First of all, the observations of equation 1 were found to be a random sample from a given population. Therefore, both fixed effect and random effect regression models have been performed. Then, to compare the two models, a Hausman test has been run to determine whether or not there were significant differences in the coefficients. The obtained statistically significant p-value of 0,000 allowed us to accept the null hypothesis. This result indicated us that the fixed effect model is more appropriate compared to the random effect one. Moreover, by caution, it was necessary to test the presence of random effects by using the Breusch-Pagam Lagrange multiplier. The result of this test was significant with a p-value equal to 0,000. This result allowed us to confirm the presence of random effects and to refuse the pooled Ordinary Least Square model. Since the Hausman test and the Breusch-Pagam Lagrange multiplier model respectively eliminated the random effect model and the pooled ordinary least square model, a fixed effect model was adopted as the best estimator for the panel data of equation 1. Finally, the Heteroskedasticity test was run to test the presence of heteroskedasticity in the fixed effect model. The obtained statistically significant p-value of

0,000 allowed us to accept the null hypothesis and confirm the presence of heteroskedasticity in the fixed effect model. Therefore, the option "robust" on Stata was used to correct the heteroskedasticity problem in the fixed effect model. The same procedure was repeated for the panel data of equation 2 and 3 and the fixed effect model was found to be the best estimator. Indeed, the fixed effect model explores the relationship between the independent variables and dependent variables within an entity as "PERMNO" (company identification code) in this particular empirical study. Each company has its own individual characteristics as independent variables that may or may not influence the dependent variables. This model removes the effects of the time-invariant characteristics and enables us to access the net effects of the independent variables on the dependent variables. Finally, this model assumes that each company is different, therefore the companies' error term and the constants, which capture individual characteristics, should not be correlated with the others. Nonetheless, for consistency, this paper reports the findings using all the three estimation techniques.

Equation 1: *Total debt (DTA)*

$$LEV_{it} = \beta_0 + \beta_1 PROF_{it} + \beta_2 SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}$$

All regression models do not produce the same relationships and estimations between the dependent and independent variables (table 8,9, and 10). The Pooled OLS model produces the highest estimation with an adjusted R^2 of 10,65% (table 8). However, the relationship between the indicators of profitability (ROA) and financial leverage (DTA) is insignificant. The same is true with the random effect model (table 10). Indeed, the relationship between size and financial leverage is insignificant. The fixed effect model (table 9) is the only one that reports significant relationships between the dependent and all independent variables. Moreover, according to the Hausman and Breush-Pagam Lagrange multiplier tests, the fixed

effect was found to be the best estimator. Therefore, the analysis for the first equation will mostly relies on the result of the fixed effect model.

Table 9: Multivariate regression results for equation 1 using robust FE

```
. xtreg DTA ROA LSALES AAG QR,robust fe

Fixed-effects (within) regression               Number of obs      =       172
Group variable: PERMNO                          Number of groups   =        43

R-squared:                                      Obs per group:
     Within  = 0.6322                                         min =         4
     Between = 0.0381                                         avg =       4.0
     Overall = 0.0143                                         max =         4

                                                F(4,42)            =     17.97
corr(u_i, Xb) = -0.9326                         Prob > F           =     0.0000

                                    (Std. err. adjusted for 43 clusters in PERMNO)
------------------------------------------------------------------------------
             |               Robust
         DTA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ROA |  -.9682161   .4230457    -2.29   0.027    -1.821957   -.1144754
     LSALES |   .3267979   .0832608     3.92   0.000     .1587709    .4948249
         AAG |   .1345518   .0482321     2.79   0.008     .0372154    .2318882
          QR |  -.1588193   .0665276    -2.39   0.022    -.2930775   -.0245611
       _cons |   -2.69009   .8603553    -3.13   0.003    -4.426357   -.9538228
-------------+----------------------------------------------------------------
     sigma_u |  .56580463
     sigma_e |  .06678662
         rho |  .98625842   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels, respectively.

Table 9 reports the relationships between the dependent variable LEV (DTA) and the independent variables using fixed effect model.

First of all, **profitability** (ROA) affects total debt of US retailers negatively at statistically significant level of 5%. This finding conflicts with Alnori (2021) and Kakanda, Bello and Abba (2016)' research studies but aligns with findings of Kasozi (2018); Javed and Akthar (2012) and Muneer (2015). According to Kasozi (2018), the South-African retail sector relies more on retained earnings to generate profits. He found that all measures of debt were statistically significant but negatively correlated with profitability. The pecking-order theory

(Myers 1984) supports this finding and indicates that excessive financing with debt negatively affect profitability. Indeed, profitable companies have enough internal reserves and do not need to depend too much on external financing, which is associated with information asymmetry problem. Therefore, the hypothesis H1a is not rejected. Profitable US retail companies should be aware that excessive financing with debt negatively affect their profitability.

Secondly, **size** (LSALES) affects total debt of US retailers positively at statistically significant level of 1%, which confirms the trade-off theory. This observation allows us to not reject the hypothesis H2a at the 99% level of confidence. As stated by Abdou et al. (2012), larger firms are less risky because they are more diversified, have lower probability of going bankrupt and higher collateral value compared to smaller one. Moreover, US retail companies of our panel data are publicly owned companies. Their stocks are publicly traded on a stock exchange which reduces asymmetric information for creditors. Therefore, largest US retailers are able to finance their operations with debt at a cheaper price.

Thirdly, **growth opportunities** (AAG) are significantly positively associated with gearing at the 99% level of confidence across all estimations. This implies that an increase in growth opportunities is associated with an increase in debt. This result conflicts with Cheng and Shiu (2007)' research study but agrees both with Daskalakis and Psillaki (2005) and Chen and Zhao (2006). Companies view growth opportunities as unsustainable and prefer debt to finance such growth in order to transfer the risk on debtholders rather than on stockholders. Moreover, companies having high growth opportunities have lower risks of financial distress and are on average more profitable, hence, they face lower borrowing costs. All these findings enable us to reject hypothesis H3a.

Finally**, liquidity** (QR) of US retail firms varies negatively with debt at statistically significant level of 5%, which confirms the pecking-order theory. This observation allows us to not reject hypothesis H4a at the 95% level of confidence. This is consistent with the studies

of Harc and Sarlija (2012) and Lipson and Mortal (2009), who found that firms with higher quick ratio will borrow less. The reasoning behind this finding is that companies regard liquidity as a source of finance. For example, when it is difficult to access the external capital market, liquidity is a guarantee for companies, in order to remain competitive.

Equation 2: *Short-term debt (STD)*

$$LEV2_{it} = \beta_0 + \beta_1\, PROF_{it} + \beta_2\, SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}$$

Table 13: Multivariate regression results for equation 2 using RE

```
. xtreg STD ROA LSALES AAG QR, re

Random-effects GLS regression                   Number of obs     =       172
Group variable: PERMNO                          Number of groups  =        43

R-squared:                                      Obs per group:
     Within  = 0.1899                                         min =         4
     Between = 0.2422                                         avg =       4.0
     Overall = 0.2116                                         max =         4

                                                Wald chi2(4)      =     38.52
corr(u_i, X) = 0 (assumed)                      Prob > chi2       =    0.0000
```

STD	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
ROA	-.1223731	.0848378	-1.44	0.149	-.2886523	.043906
LSALES	.0285996 +	.0065647	4.36	0.000	.015733	.0414662
AAG	.0524379 +	.0199282	2.63	0.009	.0133795	.0914964
QR	-.0574605 +	.0208684	-2.75	0.006	-.0983619	-.0165591
_cons	-.1627395 *	.0699286	-2.33	0.020	-.299797	-.0256821
sigma_u	.05619248					
sigma_e	.05620181					
rho	.49991705	(fraction of variance due to u_i)				

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels, respectively.

Table 13 highlights the relationships between the dependent variable LEV2 (STD) and the independent variables using random effect model. Even if the fixed effect model was found to be the best estimator for equation 2 (table 12), we decided to rely mainly on the random

effect model. Indeed, this model produces the highest estimation with an adjusted R^2 of 21,16%. Moreover, both the Pooled OLS (table 11) and the fixed effect (table 12) models do not produce enough significant relationships between the dependent and independent variables. As opposed to the random effect one that reports statistically significant relationship between the dependent and three out of the four independent variables.

Firstly, **profitability** (ROA) is negatively related to short-term debt, although not sufficiently significant across all estimations. This result conflicts with Addae et al., (2013)' research study but agrees with Kasozi (2018). Indeed, short-term debt alters profit in the long run because retail companies have to pay regular interest payment. Therefore, this finding allows us to not reject hypothesis H1b.

Secondly, **size** (LSALES) affects short-term debt of US retailers positively at statistically significant level of 1%. This observation enables us to reject hypothesis H2b at 99% confidence level. Therefore, this result highlights the fact that the US economy not only increases the access of larger firms to long-term debt but also to short-term debt.

Thirdly, **growth opportunities** (AAG) are significantly positively associated with short-term debt at the 99% level of confidence. This implies that an increase in growth opportunities is related with an increase in short-term debt for US retailers. This result agrees with Ding et al. (2020) and Dang (2011). Short-term debt allows US retailers to become financially flexible and to mitigate underinvestment problems. Indeed, US retailers are able to issue short-term that expires before the launch of a new project and to renegotiate and reprice the debt contract throughout the project duration. All these findings enable us to not reject hypothesis H3b at statistically significant level of 1%.

Finally, **liquidity** (QR) of US retail firms varies negatively with short-term debt at statistically significant level of 1%. This observation allows us to not reject hypothesis H4b at the 99% level of confidence. This is consistent with the study of Anderson (2002) , who found

that short-term debt reduces liquidity of firms. Indeed, both liquidity and short-term debt are substitute in time of lack of cash.

Equation 3: *Long-term debt (LTD)*

$$LEV3_{it} = \beta_0 + \beta_1\, PROF_{it} + \beta_2\, SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 LIQ_{it} + \varepsilon_{it}$$

Table 15: Multivariate regression results for equation 3 using robust FE

```
. xtreg LTD ROA LSALES AAG QR, robust fe

Fixed-effects (within) regression               Number of obs      =       172
Group variable: PERMNO                          Number of groups   =        43

R-squared:                                      Obs per group:
     Within  = 0.6606                                         min =         4
     Between = 0.0648                                         avg =       4.0
     Overall = 0.0135                                         max =         4

                                                F(4,42)            =     38.75
corr(u_i, Xb) = -0.9063                         Prob > F           =    0.0000

                                  (Std. err. adjusted for 43 clusters in PERMNO)
------------------------------------------------------------------------------
             |               Robust
         LTD |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ROA |  -1.411269   .232435    -6.07   0.000    -1.880342   -.9421963
      LSALES |    .183773   .0463189    3.97   0.000     .0902978    .2772483
         AAG |   .1206154   .0434471    2.78   0.008     .0329355    .2082953
          QR |  -.0784108   .0562472   -1.39   0.171    -.1919223    .0351007
       _cons |  -1.149174   .4970823   -2.31   0.026    -2.152327   -.1460216
-------------+----------------------------------------------------------------
     sigma_u |  .36622647
     sigma_e |  .05802216
         rho |  .97551378   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels, respectively.

All regression estimations do not produce the same results regarding the relationships between the dependent LEV3 (LTD) and the independent variables (table 14,15, and 16). Again, the Pooled OLS model produces the highest estimation with an adjusted R^2 of 8,56% (table 14). Moreover, all regression models have one independent variable that is not

statistically significantly related to long-term debt of US retailers. However, according to the Hausman and Breush-Pagam Lagrange multiplier tests, the fixed effect was found to be the best estimator. Therefore, the analysis for the third equation will mostly relies on the result of the fixed effect model. **Table 15** describes the relationships between the dependent variable LEV3 (LTD) and the independent variables using fixed effect model.

Firstly, **profitability** (ROA) affects long-term debt of US retailers negatively at statistically significant level of 1%. This observation enables us to reject hypothesis H1c at the 99% level of confidence. This result conflicts with Kasozi (2018), who found that long-term debt of South-African retailers increases their profitability. For US retailers, whatever the nature of the debt is, the relationship with profitability is statistically negative.

Secondly, **size** (LSALES) of US retailers varies positively with long-term debt at statistically significant level of 1%, which confirms hypothesis H2c. This result agrees with Ohman and Yazdanfar (2015)' research study. Indeed, larger firms have on average lower financial distress risks and information asymmetry problems. Therefore, they have lower monitoring and residual costs related to external financing and they can increase their ability to borrow long-term debt.

Thirdly, **growth opportunities** (AAG) affect long-term debt of US retailers positively at statistically significant level of 1%. This observation allows us to reject hypothesis H3c at the 99% level of confidence. Therefore, regardless the nature of the debt, the relationship with growth opportunities is statistically significantly positive. US retailers can finance growth opportunities with long-term as well as short-term debt.

Finally, **liquidity** (QR) negatively affects US retailers' long-term debt, which contradicts hypothesis H4c. Using the fixed effect model the relationship is insignificant. However, both the Pooled OLS and random effect models predict statistically significant

negative relationship at the 95% and 99% level of confidence respectively. Whatever the nature of the debt, liquidity of US retailers negatively alters their level of gearing.

From the regression analysis the following observations can be drawn. First of all, it is important to noticed that total, short-term and long-term debt of US retailers indicate the same results regarding their relationship with the key determinants. More precisely when US retailers' total debt is statistically negatively or positively related to one particular key determinant, short-term and long-term debt are going in the same direction. Moreover, the correlation and regression analyses give conflicting outcomes regarding the relationship between debt and size. While the correlation analyses indicate that size is negatively related with total debt and long-term debt measures, the regression analyses illustrate the opposite situation. As previously mentioned, multivariable regression models are better indicators because they are able to establish the relationship between a dependent variable and several independent variables. Therefore, the conclusions that we will draw are mainly focused on the results of the regression models.

Both liquidity and profitability negatively affect all measures of debt. Profitable US retailers prefer to finance their operations with retained earnings instead of debt instruments. Indeed, debtholders have less visibility regarding the true value of US retailers. In order to offset this risk, they ask for higher interest rates. Moreover, liquidity of US retailers is used as a source of financing operation and not to finance debt. Short-term debt and liquidity have the same role. Indeed, they are substitutes in time of lack of cash. On the contrary, both size and growth opportunities are positively related to all measures of debt. Largest US retailers are able to get debt at a cheaper price. They are more diversified, have lower financial distress risks and less problems related to asymmetric information. Moreover, most of the time, growth opportunities are perceived as unsustainable. Therefore, US retailers finance new projects

throughout debt instruments in order to transfer the risk on debtholders rather than on stockholders.

5. Conclusion and direction for future research

Our main result is that the US retail sector is not debt driven. Indeed, the way retailers finance their operations correspond to the pecking order theory. Both liquidity and profitability indicate some pecking order patterns in the financing choices of US retailers. This sector allows them to operate with negative working capital. Retailers borrow money from suppliers at no cost because they are able to delay supplier payments and increase the amount of account payable. These arguments could explain why US retailers are not highly levered. We also found that US retailers use debt to finance growth opportunities in order to transfer the risk on debtholders rather than on stockholders. They can also issue short-term that expires before the launch of a new project and can renegotiate and reprice the debt contract throughout the project duration. Furthermore, long-term debt seems to be more advantageous compared to short-term one. Indeed, it enables retailers to spread interest commitments over a longer period and therefore reduce financial risks and increase profits. That is why the majority of retailers' debt is long-term by nature.

These findings may contribute to assist managers in capital structure management decisions. Even if we found that the US retail sector aligns with the pecking order theory, managers should understand each impact of the key determinants on the capital structure. This paper could have analyzed other key factors such as asset structure, internal and external innovativeness, business risks, non-debt tax shield, and age. This would have increased the precision and accuracy of the regression models (R^2). Another suggestion to increase the robustness of the regression analyses could be to adopt a lagged variable for the debt measures. It helps to capture the transitional effects on one variable on another. According to Kasozi (2018), the use of the lagged debt variable increases the robustness of the findings. Finally, we

also could have made use of other ratio associated with the dependent and independent variables. For example, market to book value as a surrogate for growth opportunities or current ratio as a surrogate for liquidity.

References:

Abdou, H. A., Kuzmic, A., Pointon, J., and Lister, R. J. 2012. "Determinants of capital structure in the UK retail industry: a comparison of multiple regression and generalized regression neural network." *Intelligent Systems in Accounting, Finance and Management*, *19*(3): 151–169.

Addae, A. A., Nyarko-Baasi, M., and Hughes, D. 2013. "The Effects of Capital Structure on Profitability of Listed Firms in Ghana." *European Journal of Business and Management*.

Allianz. 2020."Retail in the US: Towards Destructive Destruction."

Alnori, F. 2021. "Exploring nonlinear linkage between profitability and leverage: US multinational versus domestic corporations." *Journal of International Financial Management and Accounting*, *32*(3): 311–335

Anderson, R. W. 2002. "Capital Structure, Firm Liquidity and Growth." *National Bank of Belgium.*

Awan, H. M., Ishaq, M., Raza, B., and Qureshi, A. 2010. "How growth opportunities are related to corporate leverage decisions?" *Investment Management and Financial Innovations* 7(1).

Beck, T., Demirgüç-Kunt, A., and Maksimovic, V. 2005. "Financial and legal constraints to growth: Does firm size matter?" *Journal of* Finance, 60(1):137–177.

Bevan, A. A., and Danbolt, J. 2002. "Capital Structure and its Determinants in the United Kingdom-A Decompositional Analysis." *Applied Financial Economics,* 12(3): 159-170.

Buckley, P., Barua A., and Samaddar M. 2021. "The pandemic has forced corporate debt higher" *Deloitte Insights*

Chatterjee, S., and Eyigungor, B. 2020. "The Firm Size-Leverage Relationship and Its Implications for Entry and Business Concentration." *Federal Reserve Bank of Philadelphia*

Chen, L., and Zhao, X. 2006. "On the relation between the market-to-book ratio, growth opportunity, and leverage ratio." *Finance Research Letters*, *3*(4): 253–266.

Cheng, S. R., and Shiu, C. Y. 2007."Investor protection and capital structure: International evidence." *Journal of Multinational Financial Management*, *17*(1): 30–44.

Dang, V. A. 2011. "Leverage, debt maturity and firm investment: An empirical analysis." *Journal of Business Finance and Accounting*, *38*(1–2): 225–258.

Danilevskaia, V., and Rai, A. 2005. "Choice of Short-Term and Long-Term Debt in Five Eastern European Countries." *Journal of International Business and Law* ,4(2).

Danis, A., Rettl, D. A., & Whited, T. M. 2014. "Refinancing, profitability, and capital structure." *Journal of Financial Economics*, *114*(3): 424–443.

Daskalakis, N., and Psillaki, M. 2008. “Do countrr firm factors explain capital structure? Evidence from SMEs in France and Greece.”*Applied Financial Economics*, *18*(2): 87–97.

Deesomsak, R., Paudyal, K., and Pescetto, G. 2004.”The determinants of capital structure: Evidence from the Asia Pacific region.”*Journal of Multinational Financial Management*, *14*(4–5): 387–405.

Dougherty, C. 2011. “Introduction to Panel Data Models.” Oxford University Press, 14(1): 530-541.

Ding, N., Bhat, K., and Jebran, K. 2020.”Debt choice, growth opportunities and corporate investment: evidence from China.” *Financial Innovation*, *6*(1).

Ebel Ezeoha, A. 2008. “Firm size and corporate financial-leverage choice in a developing economy: Evidence from Nigeria.” *Journal of Risk Finance*, *9*(4): 351–364.

Faulkender, M., and Petersen, M. 2006.”Does the Source of Capital Affect Capital Structure?”*Forthcoming Review of Financial Studies*

Frank, M. Z., and Goyal, V. K. 2009. “Capital Structure Decisions: Which Factors Are Reliably Important?” *Financial Management Association*, 38(1).

Graham, J., and Harvey, C. 2002. “How do CFOs make capital budgeting and capital structure decisions?” *Journal of Applied Corporate Finance*, *15*(1): 8–23.

Javed, B., Ali, M., and Ali, S. A. M. 2012.”Interrelationships between capital structure and financial performance, firm size and growth: comparison of industrial sector in KSE.” *European Journal of Business and Management,* 4(15).

Kakanda, M. M., Bello, A. B., and Abba, M. 2016. “Effect of Capital Structure on Performance of Listed Consumer Goods Companies in Nigeria.” *Research Journal of Finance and Accounting,*7(8).

Kasozi, J. S. (2018). “Capital Structure and The Profitability of Listed Retail Firms.” *Journal of Economics and Behavioral Studies*,10(1).

Kraus, A., and Litzenberger, R. H. 1973. “A State-Preference Model of Optimal Financial Leverage.” *The Journal of Finance*, 28(4).

Lipson, M. L., and Mortal, S. 2009.”Liquidity and capital structure.” *Journal of Financial Markets*, *12*(4): 611–644.

Manelli, A., Pace, R., and Leone, M. 2022. “Leverage, Growth Opportunities, and Credit Risk: Evidence from Italian Innovative SMEs.” *Risks*, *10*(4).

Myers, S.C., 1984. “The capital structure puzzle.” *Journal of Finance*, 39: 575–592

Muneer, S. 2015. “An interaction between financial practices and firm performance with moderating effect of agency cost in Pakistan corporate sector.” *University technology Malaysia*

OECD. 2020. “Covid-19 and the retail sector: impact and policy responses.”

Öhman, P., and Yazdanfar, D. 2017.”Short- and long-term debt determinants in Swedish SMEs.” *Review of Accounting and Finance*, *16*(1): 106–124

Rajan, R. G., and Zingales, L. 1995. “What Do We Know about Capital Structure? Some Evidence from International Data.*The Journal of Finance*, *50*(5): 1421–1460.

Ramalho, J. R. S., and Vidigal Da Silva, J. 2006.”A two-part fractional regression model for the financial leverage decisions of micro, small, medium, and large firms.” *University of Evora*

Rizka, Z. 2022. “Estimation model and selection method of panel data regression: an overview of common effect, fixed effect, and random effect model.” *University Islam Kalimantan MAB Banjarmasin.*

Šarlija, N., and Harc, M. 2012. “The impact of liquidity on the capital structure: a case study of Croatian firms.” *BSRJ*, *3*(1): 30–36.

Sibilkov, V. 2004. “Asset Liquidity and Capital Structure.” *University of Wisconsin*

Titman, S., and Wessels, R. 1988. “The Determinants of Capital Structure Choice.” *The Journal of Finance*, *43*(1): 1–19

Appendices:

Table 1: Definitions and measures of applied variables

Variables	Acronym	Ratio	Measures
Dependent Variables			
Leverage	LEV	Debt to assets (DTA)	Total debt/Total assets
Short term debt	LEV2	Short term debt (STD)	Total short-term debt/Total debt
Long term debt	LEV3	Long term debt (LTD)	Total long term debt/Total liabilities
Independent Variables			
Profitability	PROF	Return on assets (ROA)	Net income /Total assets
Size	SIZE	Natural logarithm of sales per year (LSALES)	Natural log(sales)
Growth opportunities	SGROW	Annual assets growth (AAG)	[Total assets(t) - total assets(t-1)]/ total assets (t-1)
Liquidity	LIQ	Quick ratio (QR)	[Current assets - inventory - prepaid expenses] /current liabilities

Table 2: Descriptive results of all variables over the 4-year period

Acronym	Ratio	Mean	Std. Dev.	Minimum	Maximum	Observations
Dependent Variables						
LEV	Debt to assets (DTA)	0,345	0,212	0,022	1,344	172
LEV2	Short term debt (STD)	0,078	0,090	0,000	0,483	172
LEV3	Long term debt (LTD)	0,415	0,162	0,030	0,747	172
Independent Variables						
PROF	Return on assets (ROA)	0,178	0,102	-0,313	0,413	172
SIZE	Natural logarithm of sales per year (LSALES)	10,029	1,484	6,246	13,146	172
SGROW	Annual assets growth (AAG)	0,119	0,253	-0,225	1,956	172
LIQ	Quick ratio (QR)	0,540	0,380	0,092	2,385	172

Table 3: Correlation results among LEV (DTA) and independent variables

```
pwcorr DTA ROA LSALES AAG QR, sig
```

	DTA	ROA	LSALES	AAG	QR
DTA	1.0000				
ROA	0.1118	1.0000			
p-value	0.1444				
LSALES	-0.1419^	-0.0033	1.0000		
p-value	0.0633	0.9659			
AAG	0.2304+	-0.0852	-0.0372	1.0000	
p-value	0.0024	0.2664	0.6282		
QR	-0.2072+	-0.1263	0.0049	0.0286	1.0000
p-value	0.0064	0.0988	0.9491	0.7092	

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 4: Correlation results among LEV2 (STD) and independent variables

```
pwcorr STD ROA LSALES AAG QR, sig
```

	STD	ROA	LSALES	AAG	QR
STD	1.0000				
ROA	-0.1096	1.0000			
p-value	0.1524				
LSALES	0.4537+	-0.0033	1.0000		
p-value	0.0000	0.9659			
AAG	0.0971	-0.0852	-0.0372	1.0000	
p-value	0.2050	0.2664	0.6282		
QR	-0.0507	-0.1263	0.0049	0.0286	1.0000
p-value	0.5089	0.0988	0.9491	0.7092	

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 5: Correlation results among LEV3 (LTD) and independent variables

```
pwcorr LTD ROA LSALES AAG QR, sig
```

	LTD	ROA	LSALES	AAG	QR
LTD	1.0000				
ROA	-0.0040	1.0000			
p-value	0.9588				
LSALES	-0.1770*	-0.0033	1.0000		
p-value	0.0202	0.9659			
AAG	0.2210+	-0.0852	-0.0372	1.0000	
p-value	0.0036	0.2664	0.6282		
QR	-0.1664*	-0.1263	0.0049	0.0286	1.0000
p-value	0.0291	0.0988	0.9491	0.7092	

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 6: Correlation results among with STD and LTD as independent variables

```
pwcorr DTA STD LTD ROA LSALES AAG QR, sig
```

	DTA	STD	LTD	ROA	LSALES	AAG	QR
DTA	1.0000						
STD	-0.1208	1.0000					
p-value	0.1144						
LTD	0.8092+	-0.2442+	1.0000				
p-value	0.0000	0.0012					
ROA	0.1118	-0.1096	-0.0040	1.0000			
p-value	0.1444	0.1524	0.9588				
LSALES	-0.1419^	0.4537+	-0.1770*	-0.0033	1.0000		
p-value	0.0633	0.0000	0.0202	0.9659			
AAG	0.2304+	0.0971	0.2210+	-0.0852	-0.0372	1.0000	
p-value	0.0024	0.2050	0.0036	0.2664	0.6282		
QR	-0.2072+	-0.0507	-0.1664*	-0.1263	0.0049	0.0286	1.0000
p-value	0.0064	0.5089	0.0291	0.0988	0.9491	0.7092	

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 7: Dougherty's framework (2011)

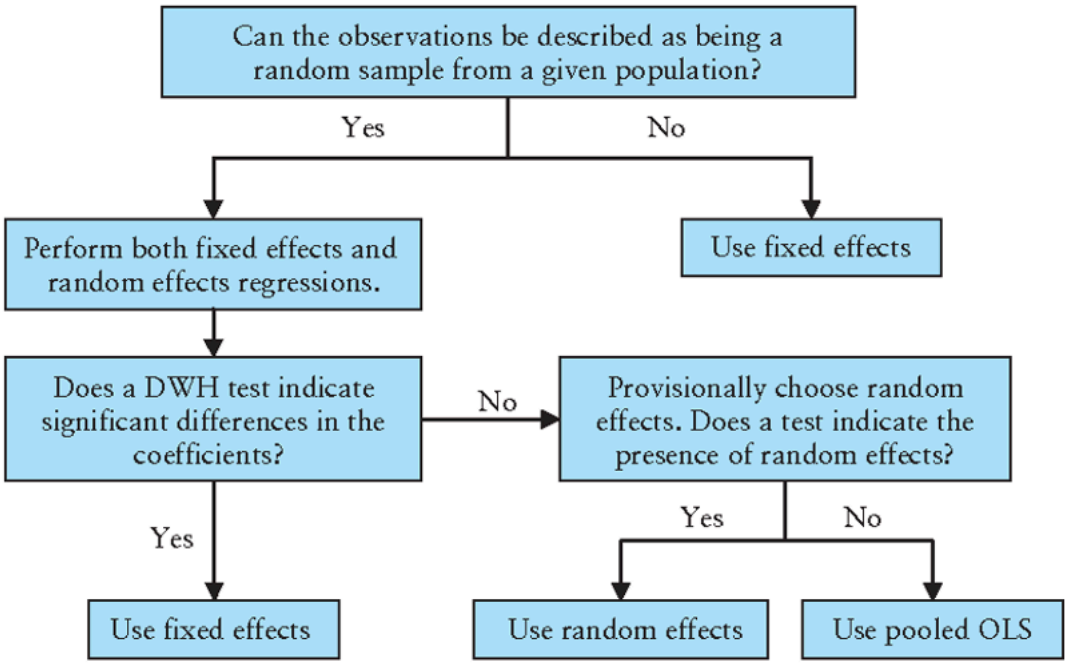

Table 8: Multivariate regression results for equation 1 using Pooled OLS

```
reg DTA ROA LSALES AAG QR
```

Source	SS	df	MS		
				Number of obs	= 172
				F(4, 167)	= 6.10
Model	.977667168	4	.244416792	Prob > F	= 0.0001
Residual	6.69614826	167	.040096696	R-squared	= 0.1274
				Adj R-squared	= 0.1065
Total	7.67381543	171	.044876114	Root MSE	= .20024

DTA	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ROA	.2210442	.1516946	1.46	0.147	-.078442	.5205304
LSALES	-.0187891^	.0103227	-1.82	0.071	-.0391689	.0015908
AAG	.2010831+	.0607599	3.31	0.001	.0811266	.3210395
QR	-.1115559+	.0406526	-2.74	0.007	-.1918151	-.0312967
_cons	.5309076+	.1115732	4.76	0.000	.3106319	.7511834

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 9: Multivariate regression results for equation 1 using robust FE

```
. xtreg DTA ROA LSALES AAG QR,robust fe

Fixed-effects (within) regression               Number of obs      =       172
Group variable: PERMNO                          Number of groups   =        43

R-squared:                                      Obs per group:
     Within  = 0.6322                                         min =         4
     Between = 0.0381                                         avg =       4.0
     Overall = 0.0143                                         max =         4

                                                F(4,42)            =     17.97
corr(u_i, Xb) = -0.9326                         Prob > F           =    0.0000

                                 (Std. err. adjusted for 43 clusters in PERMNO)
------------------------------------------------------------------------------
             |               Robust
         DTA |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ROA |  -.9682161   .4230457    -2.29   0.027    -1.821957   -.1144754
      LSALES |   .3267979   .0832608     3.92   0.000     .1587709    .4948249
         AAG |   .1345518   .0482321     2.79   0.008     .0372154    .2318882
          QR |  -.1588193   .0665276    -2.39   0.022    -.2930775   -.0245611
       _cons |   -2.69009   .8603553    -3.13   0.003    -4.426357   -.9538228
-------------+----------------------------------------------------------------
     sigma_u |  .56580463
     sigma_e |  .06678662
         rho |  .98625842   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 10: Multivariate regression results for equation 1 using RE

```
. xtreg DTA ROA LSALES AAG QR,re

Random-effects GLS regression                   Number of obs      =       172
Group variable: PERMNO                          Number of groups   =        43

R-squared:                                      Obs per group:
     Within  = 0.5272                                         min =         4
     Between = 0.0098                                         avg =       4.0
     Overall = 0.0090                                         max =         4

                                                Wald chi2(4)       =    122.18
corr(u_i, X) = 0 (assumed)                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         DTA |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ROA |   -.792626   .1802714    -4.40   0.000    -1.145951   -.4393005
      LSALES |   .0244428   .0212108     1.15   0.249    -.0171296    .0660151
         AAG |   .1730314   .0283691     6.10   0.000     .1174289    .2286339
          QR |  -.1949394    .038573    -5.05   0.000    -.2705411   -.1193376
       _cons |   .3258307   .2219235     1.47   0.142    -.1091313    .7607927
-------------+----------------------------------------------------------------
     sigma_u |  .18779135
     sigma_e |  .06678662
         rho |  .88771968   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 11: Multivariate regression results for equation 2 using OLS

```
reg STD ROA LSALES AAG QR
```

Source	SS	df	MS		
Model	.324633038	4	.08115826	Number of obs	= 172
Residual	1.06624547	167	.006384703	F(4, 167)	= 12.71
				Prob > F	= 0.0000
				R-squared	= 0.2334
				Adj R-squared	= 0.2150
Total	1.39087851	171	.008133792	Root MSE	= .0799

STD	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ROA	-.0951985	.0605322	-1.57	0.118	-.2147054	.0243083
LSALES	.0278067 +	.0041192	6.75	0.000	.0196743	.0359391
AAG	.0380975	.0242456	1.57	0.118	-.0097699	.0859649
QR	-.0165319	.016222	-1.02	0.310	-.0485585	.0154947
_cons	-.180015 +	.0445221	-4.04	0.000	-.2679137	-.0921162

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 12: Multivariate regression results for equation 2 using robust FE

```
. xtreg STD ROA LSALES AAG QR, robust fe

Fixed-effects (within) regression               Number of obs      =       172
Group variable: PERMNO                          Number of groups   =        43

R-squared:                                      Obs per group:
     Within  = 0.2136                                         min =         4
     Between = 0.1984                                         avg =       4.0
     Overall = 0.1789                                         max =         4

                                                F(4,42)            =     10.04
corr(u_i, Xb) = -0.5664                         Prob > F           =    0.0000

                                  (Std. err. adjusted for 43 clusters in PERMNO)
------------------------------------------------------------------------------
             |               Robust
         STD |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         ROA |  -.0833772   .1624364    -0.51   0.610    -.4111872    .2444327
      LSALES |   .0454564   .0394442     1.15   0.256    -.0341453     .125058
         AAG |   .0535137 * .0205976     2.60   0.013     .011946    .0950813
          QR |  -.1288928 + .0345942    -3.73   0.001    -.1987066   -.0590789
       _cons |  -.3002755   .407004     -0.74   0.465    -1.121643    .5210918
-------------+----------------------------------------------------------------
     sigma_u |  .08092793
     sigma_e |  .05620181
         rho |  .67463414   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 13: Multivariate regression results for equation 2 using RE

```
. xtreg STD ROA LSALES AAG QR, re

Random-effects GLS regression                   Number of obs     =       172
Group variable: PERMNO                          Number of groups  =        43

R-squared:                                      Obs per group:
     Within  = 0.1899                                         min =         4
     Between = 0.2422                                         avg =       4.0
     Overall = 0.2116                                         max =         4

                                                Wald chi2(4)      =     38.52
corr(u_i, X) = 0 (assumed)                      Prob > chi2       =    0.0000
```

STD	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
ROA	-.1223731	.0848378	-1.44	0.149	-.2886523	.043906
LSALES	.0285996 +	.0065647	4.36	0.000	.015733	.0414662
AAG	.0524379 +	.0199282	2.63	0.009	.0133795	.0914964
QR	-.0574605 +	.0208684	-2.75	0.006	-.0983619	-.0165591
_cons	-.1627395 *	.0699286	-2.33	0.020	-.299797	-.0256821
sigma_u	.05619248					
sigma_e	.05620181					
rho	.49991705	(fraction of variance due to u_i)				

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 14: Multivariate regression results for equation 3 using OLS

```
reg LTD ROA LSALES AAG QR
```

Source	SS	df	MS		
				Number of obs	= 172
				F(4, 167)	= 5.00
Model	.482028413	4	.120507103	Prob > F	= 0.0008
Residual	4.02520665	167	.024103034	R-squared	= 0.1069
				Adj R-squared	= 0.0856
Total	4.50723506	171	.0263581	Root MSE	= .15525

LTD	Coefficient	Std. err.	t	P>|t|	[95% conf.	interval]
ROA	-.0122036	.117612	-0.10	0.917	-.2444016	.2199943
LSALES	-.0183731 *	.0080034	-2.30	0.023	-.0341741	-.0025721
AAG	.1404974 +	.0471084	2.98	0.003	.0474927	.2335022
QR	-.0738812 *	.0315188	-2.34	0.020	-.1361079	-.0116546
_cons	.624648 +	.086505	7.22	0.000	.4538636	.7954324

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 15: Multivariate regression results for equation 3 using robust FE

```
. xtreg LTD ROA LSALES AAG QR, robust fe

Fixed-effects (within) regression               Number of obs      =       172
Group variable: PERMNO                          Number of groups   =        43

R-squared:                                      Obs per group:
     Within  = 0.6606                                         min =         4
     Between = 0.0648                                         avg =       4.0
     Overall = 0.0135                                         max =         4

                                                F(4,42)            =     38.75
corr(u_i, Xb) = -0.9063                         Prob > F           =    0.0000

                                    (Std. err. adjusted for 43 clusters in PERMNO)
------------------------------------------------------------------------------
             |               Robust
         LTD |      Coef.   Std. err.      t    P>|t|     [95% conf. interval]
-------------+----------------------------------------------------------------
         ROA |  -1.411269   .232435    -6.07   0.000    -1.880342   -.9421963
      LSALES |    .183773   .0463189    3.97   0.000     .0902978    .2772483
         AAG |   .1206154   .0434471    2.78   0.008     .0329355    .2082953
          QR |  -.0784108   .0562472   -1.39   0.171    -.1919223    .0351007
       _cons |  -1.149174   .4970823   -2.31   0.026    -2.152327   -.1460216
-------------+----------------------------------------------------------------
     sigma_u |  .36622647
     sigma_e |  .05802216
         rho |  .97551378   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 16: Multivariate regression results for equation 3 using RE

```
. xtreg LTD ROA LSALES AAG QR, re

Random-effects GLS regression                   Number of obs      =       172
Group variable: PERMNO                          Number of groups   =        43

R-squared:                                      Obs per group:
     Within  = 0.5933                                         min =         4
     Between = 0.0077                                         avg =       4.0
     Overall = 0.0195                                         max =         4

                                                Wald chi2(4)       =    142.66
corr(u_i, X) = 0 (assumed)                      Prob > chi2        =    0.0000

------------------------------------------------------------------------------
         LTD |      Coef.   Std. err.      z    P>|z|     [95% conf. interval]
-------------+----------------------------------------------------------------
         ROA |  -.9788697   .1484753    -6.59   0.000    -1.269876   -.6878633
      LSALES |   .0019407   .0158432     0.12   0.903    -.0291114    .0329928
         AAG |   .1572857   .0244779     6.43   0.000     .1093098    .2052616
          QR |  -.1137851   .0324348    -3.51   0.000    -.1773561   -.0502142
       _cons |   .6122558   .1661351     3.69   0.000      .286637    .9378746
-------------+----------------------------------------------------------------
     sigma_u |  .13680539
     sigma_e |  .05802216
         rho |  .84754425   (fraction of variance due to u_i)
------------------------------------------------------------------------------
```

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.

Table 17: Multivariate regression results with STD and LTD as independent variables using robust RE

```
. xtreg DTA STD LTD ROA LSALES AAG QR,re

Random-effects GLS regression                   Number of obs     =       172
Group variable: PERMNO                          Number of groups  =        43

R-squared:                                      Obs per group:
     Within  = 0.8589                                         min =         4
     Between = 0.6093                                         avg =       4.0
     Overall = 0.6584                                         max =         4

                                                Wald chi2(6)      =    832.13
corr(u_i, X) = 0 (assumed)                      Prob > chi2       =    0.0000
```

DTA	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
STD	.3923018 +	.0643363	6.10	0.000	.2662049	.5183987
LTD	1.022491 +	.0516895	19.78	0.000	.9211814	1.123801
ROA	.3775115 +	.1154335	3.27	0.001	.151266	.603757
LSALES	.005902	.0122725	0.48	0.631	-.0181516	.0299557
AAG	-.0033372	.0176737	-0.19	0.850	-.037977	.0313026
QR	-.0381842 ^	.0231052	-1.65	0.098	-.0834695	.0071011
_cons	-.2146214 ^	.1293349	-1.66	0.097	-.4681132	.0388704
sigma_u	.11917588					
sigma_e	.0393363					
rho	.90175735	(fraction of variance due to u_i)				

Where (+), (*) and (^) represent statistical significance at the 1%, 5% and 10% levels respectively.