

Determinants of Working Capital and Investment Financing Patterns of SMEs: Evidence from Turkey

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Abstract

This paper analyzes the firm level determinants of the financing sources composition of working capital and fixed asset investments of Turkish SMEs with a system of equations approach. Using the cross-sectional data set of 1,278 SMEs for year 2013, we find that larger firms and firms that have an internationally recognized quality certification finance a lower proportion of their working capital with internal funds. The proportion of working capital that is financed with bank loans is higher for these firms. A higher portion of working capital is financed with purchases on credit from suppliers and advances from customers by firms that are larger and firms that are younger. Firms with lower export intensity finance a higher portion of fixed asset investments with internal funds. The proportion of fixed asset investments that is financed with bank loans is lower for older firms. Older firms and firms with a lower percentage of sales made on credit use internal financing more intensively to finance both working capital and fixed asset investments. Firms with a higher percentage of sales made on credit finance a higher portion of their working capital and fixed asset investments with bank loans.

JEL classification numbers: C21, G21, G30, G32

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1 Introduction and Background

SMEs are important for all economies in the world because of their contribution to GDP growth, job creation and government revenues from taxation. They are central to private sector development and they serve as engines of innovation. Having access to external financing is critical for the survival and growth of SMEs which are dependent on bank lending. However, SMEs face financing obstacles that hinder their potential to grow and create jobs (Hughes, 2009; Mason and Kwok, 2010; Shen, Shen, Xu and Bai, 2009).

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Difficulties encountered in accessing bank financing adversely affect the day-to-day functioning and growth of SMEs.

SME literature suggests that these firms face higher barriers to bank financing than large firms (Beck, Demirguc-Kunt, Laeven and Maksimovic, 2006; Beck, Demirguc-Kunt and Maksimovic, 2008; Pissarides, 1999). SMEs encounter greater difficulties in accessing bank financing because they are informationally opaque and it is difficult for banks to evaluate their corporate capabilities (Ang 1992; Berger and Udell, 1998; Gregory, Rutherford, Oswald and Gardiner, 2005). Moreover, their financial statements are not as informative as those of large firms and they have shorter credit histories. Information asymmetry and monitoring costs that banks should incur also increases the transactions costs of SME lending for banks.

Accessing bank financing is more challenging for emerging market SMEs (Hanedar, Broccardo and Bazzana, 2014; Menkhoff, Neuberger and Rungkruxsivorn, 2012; Menkhoff, Neuberger and Suwanaporn, 2006; Zhou, 2007). Inability to access bank financing is exacerbated with “informality” in emerging economies where many SMEs operate outside the formal sector (OECD, 2006).

When SMEs do not have access to bank financing, they count on internal cash flows or informal sources of credit. Especially emerging market SMEs frequently fall into this situation (OECD, 2006). Cosh and Hughes (1994) suggest that because access of SMEs to external funds is more difficult than that of large firms, the pecking order theory (Myers, 1984; Myers and Majluf, 1984) which suggests that firms primarily rely on internal funds rather than external funds can be easily applied to SMEs.

Petersen and Rajan (1997) and Nilsen (2002) argue that firms that are financially constrained are more likely to use trade credit and informal lending as alternative sources of finance. Nilsen (2002) find that bank lending constrained firms use trade credit to finance their working capital. On the contrary, Beck et al. (2008) show that although small firms have lower access to bank loans than large firms, they do not try to compensate for this problem with higher use of trade finance.

Beck (2007) shows that small SMEs finance a larger share of their fixed asset investments with internal funds, equity and informal finance than large SMEs. The author also provides evidence that larger SMEs are more likely to use bank loans to finance investments.

Because access to finance is of critical importance for the development of the SME sector, analyzing how firm level factors affect the composition of funding sources of SMEs would be a useful contribution to the literature. This study examines the determinants of the share of different financing sources in the financing of working capital and fixed asset investments by SMEs in an emerging market context, namely Turkey. The cross-sectional data set of 1,278 SMEs for the year 2013 is used for the analysis. We estimate two system of equations models where the share of different financing sources that are used to finance working capital and investments are taken as the dependent variables and the factors that are expected to affect the choice of financing sources are taken as the independent variables. We find that the proportion of internal funds used for working capital financing is lower for larger firms, younger firms, firms with a higher percentage of sales made on credit and firms that have an internationally recognized quality certification. Larger firms, firms with a higher percentage of sales made on credit and firms that have an internationally recognized quality certification finance a higher portion of their working capital with bank loans. A higher proportion of the working capital is financed with purchases on credit from suppliers and advances from customers by larger firms and

younger firms.

The proportion of fixed asset investments financed with internal funds is higher for older firms, firms with a lower percentage of sales made on credit and firms with a lower export intensity. Younger firms and firms with a higher percentage of sales made on credit use bank loans more intensively to finance fixed asset investments. Firms with a higher export intensity finance a higher proportion of investments with purchases on credit from suppliers and advances from customers.

This paper is structured as follows: Section 2 describes the methodology and section 3 depicts the sample. Section 4 presents the empirical results and section 5 concludes.

2 Methodology

The composition of the funding sources for working capital can be described with the following system of seemingly unrelated regressions model:

$$\text{Internal Funds}_{\text{WC},i} = \alpha_1 + \beta_1 \text{Size}_i + \delta_1 \text{Age}_i + \chi_1 \text{Group}_i + \phi_1 \text{Sales on Credit}_i + \lambda_1 \text{Export}_i + \eta_1 \text{Quality}_i + e_{1,i}, \quad (1)$$

$$\text{Bank Loans}_{\text{WC},i} = \alpha_2 + \beta_2 \text{Size}_i + \delta_2 \text{Age}_i + \chi_2 \text{Group}_i + \phi_2 \text{Sales on Credit}_i + \lambda_2 \text{Export}_i + \eta_2 \text{Quality}_i + e_{2,i}, \quad (2)$$

$$\text{Suppliers and Customers}_{\text{WC},i} = \alpha_3 + \beta_3 \text{Size}_i + \delta_3 \text{Age}_i + \chi_3 \text{Group}_i + \phi_3 \text{Sales on Credit}_i + \lambda_3 \text{Export}_i + \eta_3 \text{Quality}_i + e_{3,i}, \quad (3)$$

$$\text{Other}_{\text{WC},i} = \alpha_4 + \beta_4 \text{Size}_i + \delta_4 \text{Age}_i + \chi_4 \text{Group}_i + \phi_4 \text{Sales on Credit}_i + \lambda_4 \text{Export}_i + \eta_4 \text{Quality}_i + e_{4,i}, \quad (4)$$

where the dependent variables show the proportion of each funding source used in the financing of working capital.

The composition of the funding sources for fixed asset investments can be described with the following system of seemingly unrelated regressions model:

$$\text{Internal Funds}_{\text{INV},i} = \alpha_5 + \beta_5 \text{Size}_i + \delta_5 \text{Age}_i + \chi_5 \text{Group}_i + \phi_5 \text{Sales on Credit}_i + \lambda_5 \text{Export}_i + \eta_5 \text{Quality}_i + e_{5,i}, \quad (1)$$

$$\text{Owner and Equity}_{\text{INV},i} = \alpha_6 + \beta_6 \text{Size}_i + \delta_6 \text{Age}_i + \chi_6 \text{Group}_i + \phi_6 \text{Sales on Credit}_i + \lambda_6 \text{Export}_i + \eta_6 \text{Quality}_i + e_{6,i}, \quad (2)$$

$$\text{Bank Loans}_{\text{INV},i} = \alpha_7 + \beta_7 \text{Size}_i + \delta_7 \text{Age}_i + \chi_7 \text{Group}_i + \phi_7 \text{Sales on Credit}_i + \lambda_7 \text{Export}_i + \eta_7 \text{Quality}_i + e_{7,i}, \quad (3)$$

$$\text{Suppliers and Customers}_{\text{INV},i} = \alpha_8 + \beta_8 \text{Size}_i + \delta_8 \text{Age}_i + \chi_8 \text{Group}_i + \phi_8 \text{Sales on Credit}_i + \lambda_8 \text{Export}_i + \eta_8 \text{Quality}_i + e_{8,i}, \quad (4)$$

$$\text{Other}_{\text{INV},i} = \alpha_9 + \beta_9 \text{Size}_i + \delta_9 \text{Age}_i + \chi_9 \text{Group}_i + \phi_9 \text{Sales on Credit}_i + \lambda_9 \text{Export}_i + \eta_9 \text{Quality}_i + e_{9,i} \quad (5)$$

The sum of the funding sources adds up to 100%. *Internal Funds* represents the proportion financed with internal funds and retained earnings by firm *i*. *Owner and Equity* represents the proportion financed with the contribution of the owner and issuance of new equity shares. *Bank Loans* represents the share of bank loans in total funds. *Suppliers and Customers* represents the share of purchase on credit from suppliers and advances from customers in the total funds used. *Other* represents the share of debt received from nonbank financial institutions and funds provided by microfinance institutions, credit cooperatives, money lenders, friends, relatives, etc. in total funding.

Among our independent variables, *Size* represents firm size and it is measured with the number of employees of the firm. *Size* is included in the model because we expect size to affect the possibility that the firm is facing financing constraints and the way investments are financed (Beck et al., 2006; Beck et al., 2008; Berger and Udell, 1992, 1998).

Age represents firm age. Firm age is also expected to affect the funding patterns of firms. Canton, Grilo, Monteagudo and Van der Zwan (2010) argue that younger firms encounter higher financing constraints because they do not have adequate credit histories that provide the banks with information about whether repayment is risky.

Group represents dummy variable for business-group affiliation. Group affiliation may affect the financing patterns of SMEs because existence of an internal capital market within a group that the firm is affiliated to may affect the way necessary funds are provided. *Sales on Credit* represents percentage of sales made on credit. Because the proportion of sales sold on credit can affect cash reserves, it can also have an effect on the financing patterns of firm.

Export represents percentage of sales exported by the firm. Exposure to foreign trade is expected to affect access to financing and financing patterns. Exporting may positively affect access to finance by bringing competitiveness and efficiency (Ganesh-Kumar, Sen and Vaidya, 2001). On the other hand, it may make SMEs credit-constrained as a result of exposure to greater uncertainty, failure risk and need of working capital (Amiti and Weinstein, 2011).

Quality represents dummy variable for having an internationally recognized quality certification. Having an internationally recognized quality certification is expected to positively affect access to external financing.

Industry dummies are included in the analysis to control for industry specific effects. Because none of the independent variables have a VIF value that is above the cutoff value of 4, there is no problem of multicollinearity in our data. Table 1 presents the description of the variables used in the system of equations models.

3 Data

The cross-sectional data are from World Bank Enterprise Survey conducted in year 2013.

Table 1: Description of the variables used in the system of equations

Dependent Variables for Model 1 (Working Capital) and Model 2 (Fixed Asset Investments)	
Internal Financing	The proportion that was financed with internal funds or retained earnings in 2012
Owner and Equity	The proportion that was financed with owners' contribution or issued new equity shares in 2012
Bank Loans	The proportion that was financed with bank loans in 2012
Suppliers and Customers	The proportion that was financed with purchases on credit from suppliers and advances from customers in 2012
Other	The proportion that was financed with debt received from nonbank financial institutions and funds provided by microfinance institutions, credit cooperatives, money lenders, friends, relatives, etc. in 2012
Independent Variables	
Size	The number of full time employees
Age	Firm age
Group	Dummy=1 if the firm is part of a larger firm
Sales on Credit	Percentage of sales that was sold on credit in 2012
Export	Percentage of sales that was exported in 2012
Quality	Dummy=1 if the firm has an internationally recognized quality certification

The responses given to face-to-face interviews allow us to construct our variables. 1,278 firms whose number of employees is less than or equal to 250 are included in the analysis. The SMEs that are included in the analysis operate in nine industry categories (food, textiles, garments, non-metallic mineral products, fabricated metal products, other manufacturing, retail, other services). The data are accessible from www.enterprisesurveys.org. The web site also includes information on the sampling method.

Summary statistics of the dependent variables for the two models (model 1 for working capital and model 2 for fixed asset investments) and the independent variables are given in Table 2. We see that internal financing is the predominant source of finance that is used for financing working capital. On average, firms finance 71.2% of their working capital investments with internal funds. SMEs rely on bank financing as the second source for working capital financing.

Table 2: Summary statistics

	Mean	Standard Deviation	Median
Dependent Variables (Model 1: Working Capital Financing)			
Internal Financing	0.712	0.342	0.800
Bank Loans	0.169	0.269	0.000
Suppliers and Customers	0.073	0.171	0.000
Other	0.032	0.121	0.000
Dependent Variables (Model 2: Fixed Asset Investments Financing)			
Internal Financing	0.598	0.404	0.700
Owner and Equity	0.061	0.184	0.000
Bank Loans	0.267	0.370	0.000
Suppliers and Customers	0.025	0.096	0.000
Other	0.025	0.114	0.000
Independent Variables			
Size	43.529	51.971	20.000
Age	18.042	12.678	16.000
Sales on Credit	0.475	0.323	0.500
Export	0.293	0.379	0.020
Group (Dummy)	Percentage Frequency of 1 = 19%		
Quality (Dummy)	Percentage Frequency of 1 = 40%		

The proportion of working capital that is financed with bank loans is 16.9% on average. The mean of the proportion of working capital that is financed with trade credits from suppliers and advances from customers is 7.3%. Other sources make up 3.2% of working capital financing.

Firms mainly rely on internal financing also for fixed asset investments. On average, firms finance 59.8% of their fixed asset investments with internal funds and retained earnings. The proportion of fixed asset investments financed with bank borrowing is 26.7% on average. The mean of the proportion of fixed asset capital expenditures that is financed with owners' contribution or issued new equity shares is 6.1%. The mean of the proportion of fixed asset investments that is financed with purchases on credit from suppliers and advances from customers is 2.5%. Other sources make up 2.5% of fixed asset investments financing.

4 Empirical Findings

4.1 Results of the System of Equations Model for the Composition of the Funding Sources for Working Capital

We begin our empirical analysis with the estimation of the system of four equations model described by equations (1)-(4) where the dependent variables give the proportion of working capital financed with each source. Seemingly unrelated regressions are used in

the estimation. The estimation results of the system of equations are given in Table 3.

Table 3: Estimation results for the composition of the funding sources for working capital

Dependent Variables	Independent Variables						R ²
	Size	Age	Group	Sales on Credit	Export	Quality	
Internal Financing	-0.001*** (0.003)	0.002** (0.029)	-0.033 (0.213)	-0.001*** (0.000)	0.000 (0.445)	-0.022** (0.015)	0.02
Bank Loans	0.001*** (0.008)	-0.001 (0.197)	-0.008 (0.714)	0.001*** (0.000)	0.000 (0.435)	0.016* (0.085)	0.04
Suppliers and Customers	0.0003** (0.014)	-0.001* (0.059)	0.009 (0.529)	0.000 (0.161)	0.000 (0.857)	-0.001 (0.912)	0.06
Other	-0.000 (0.171)	-0.000 (0.866)	0.031*** (0.002)	0.000 (0.510)	0.0003*** (0.000)	0.007 (0.166)	0.02

P-values are presented in parentheses. Significance at the 1%, 5% and 10% are denoted by ***, ** and * respectively.

We see that size has a statistically significant relationship with the proportion of working capital that is financed with internal funds at the 0.01 level. The negative coefficient indicates that a 10% increase in size produces a 0.01 % decrease in the share of internal funds in working capital financing.

The estimated coefficient for size in bank loans regression is statistically significant at the 0.01 level. The positive coefficient indicates that a 10% increase in size brings a 0.01% increase in the proportion of working capital financed with bank loans. The positive statistically significant coefficient of size estimated in suppliers and customers regression shows that a 10% increase in size produces a 0.003% increase in the share of purchases on credit from suppliers and advances from customers in the financing of working capital. We see that size does not have a statistically significant relationship with the share of other sources in working capital financing.

The positive statistically significant coefficient of age estimated in internal financing regression shows that a 10% increase in age produces a 0.02% increase in the share of internal funds used for working capital financing. Age has a statistically significant negative impact on the share of purchases on credit from suppliers and advances from customers in working capital financing. The coefficient shows that a 10% increase in age brings a 0.01% decrease in the proportion of working capital financed with this source. Age does not affect the share of bank loans and other sources in working capital financing.

Group dummy variable has a statistically significant relationship with the share of other sources used for working capital financing. The positive coefficient indicates that firms that are part of a larger firm finance a larger portion of their working capital with sources other than internal financing, bank loans and purchases on credit from suppliers and advances from customers. This finding may signal the use of internal capital markets within the groups that the firms are operating in for working capital financing.

The negative statistically significant coefficient of sales on credit variable estimated in internal financing regression shows that a 10% increase in the percentage of sales sold on credit brings a 0.01% reduction in the proportion of working capital financed with internal funds. The statistically significant coefficient of sales on credit estimated in bank loans regression shows that the percentage of sales made on credit has a positive relationship with the share of bank loans in working capital financing. The coefficient indicates that a 10% increase in the percentage of sales made on credit produces a 0.01% increase in the share of bank loans. Sales on credit variable does not have a statistically significant effect on the share of the other sources of funds in working capital financing.

The estimated coefficient of export variable in other regression is statistically significant at the 0.01 level. However, the coefficient that is approximately zero shows that the percentage of sales exported has a minuscule effect on the proportion of working capital that is financed with other sources such as debt received from nonbank financial institutions and funds provided by microfinance institutions, credit cooperatives, money lenders, friends, relatives, etc.

Quality dummy variable has a statistically significant negative relationship with the share of internal funds used in working capital financing. The negative relationship shows that SMEs that has an internationally recognized quality certification finance a lower proportion of their working capital with internal funds. The estimated positive coefficient for quality dummy variable in bank loans regression is statistically significant at the 0.05 level. The positive coefficient shows that SMEs that have an internationally recognized quality certification finance a higher proportion of their fixed asset investments with bank loans. This finding may signal that the existence of such a certification may make it easier for firms to have access to bank financing.

4.2 Results of the System of Equations Model for the Composition of the Funding Sources for Fixed Asset Investments

The estimation results of the system of equations described by equations (5)-(9) where the dependent variables give the proportion of fixed asset investments financed with each source are given in Table 4. We see that size has a negative relationship with the proportion of fixed asset investments that is financed with other sources such as debt received from nonbank financial institutions and funds provided by microfinance institutions, money lenders, friends, etc. The coefficient shows that a 10% increase in size brings a 0.002% reduction in the share of these sources.

Table 4: Estimation results for the composition of the funding sources for fixed asset investments

Dependent Variables	Independent Variables						R ²
	Size	Age	Group	Sales on Credit	Export	Quality	
Internal Financing	-0.001 (0.218)	0.005*** (0.003)	-0.065 (0.165)	-0.002*** (0.001)	-0.001** (0.034)	-0.037 (0.214)	0.02
Owner and Equity	0.000 (0.315)	-0.001 (0.439)	-0.022 (0.402)	-0.000 (0.793)	0.000 (0.668)	0.017 (0.299)	0.03
Bank Loans	0.001 (0.156)	-0.004*** (0.006)	0.052 (0.258)	0.002*** (0.001)	0.000 (0.960)	0.011 (0.697)	0.09
Suppliers and Customers	-0.000 (0.744)	-0.000 (0.697)	0.017** (0.065)	-0.000 (0.997)	0.0002** (0.023)	0.004 (0.405)	0.03
Other	-0.0002* (0.065)	0.0002 (0.731)	0.018 (0.220)	0.000 (0.645)	0.001*** (0.000)	0.004 (0.674)	0.07

P-values are presented in parentheses. Significance at the 1%, 5% and 10% are denoted by ***, ** and * respectively.

Age has a positive effect on the share of internal funds in fixed asset investments financing. The coefficient indicates that a 10% increase in age brings a 0.05% increase in the share of internal funds used in the financing of fixed asset investments. Moreover, age has a negative effect on the proportion of investments financed with bank loans. A 10% increase in age brings a 0.04% reduction in the share of bank loans used in investments financing.

Group dummy variable has a statistically significant positive relationship with the share of purchases on credit from suppliers and advances from customers in fixed asset investments financing. The positive relationship shows that SMEs that are part of a larger firm finance a higher proportion of their fixed asset investments with these sources.

The negative statistically significant coefficient of sales on credit variable in internal financing regression shows that a 10% increase in percentage of sales made on credit is associated with a 0.02% decrease in the proportion of fixed asset investments financed with internal funds. Sales on credit has a statistically significant positive relationship with the share of bank loans in investments financing at the 0.05 level. A 10% increase in the percentage of sales made on credit brings a 0.02% increase in the share of bank loans in the financing of fixed asset investments. These findings may signal that an increase in the proportion of sales sold on credit causes a deficiency in the availability of cash reserves and internal funds for investments of fixed assets. Eventually, firms may be obliged to finance investments with bank loans.

Export variable has a statistically significant negative relationship with the proportion of internal funds used for fixed asset investments financing. A 10% increase in the percentage of sales exported brings a 0.01% reduction in the share of internal funds used. The estimated positive coefficients for export variable in suppliers and customers and other regressions are statistically significant at the 0.05 and 0.01 level respectively. The positive coefficients indicate that a 10% increase in percentage of sales exported brings a

0.002% increase in the proportion of purchases on credit from suppliers and advances from customers and a 0.01% increase in the share of debt received from nonbank financial institutions and funds provided by microfinance institutions, money lenders, etc. The insignificant coefficient of quality variable estimated in all of our regressions show that having an internationally recognized quality certification does not have a statistically significant effect on the share of each source in fixed asset investments financing.

5 Conclusion

This paper analyzes the firm level determinants of the proportion of different financing sources used by SMEs in the financing of working capital and fixed asset investments with a system of equations approach. We use data from the World Bank Enterprise Survey conducted in Turkey in 2013 and our sample includes 1,278 SMEs.

We find that larger firms use less internal financing and more bank loans and purchases on credit from suppliers and advances from customers as sources to finance their working capital. Older firms use purchases on credit from suppliers and advances from customers less than younger firms to finance their working capital. Firms that have a group affiliation finance a higher portion of their working capital with sources such as debt received from nonbank financial institutions and funds provided by microfinance institutions, credit cooperatives, money lenders, friends and relatives. The reason behind this finding is probably the use of internal capital markets within groups. The share of these other sources of funds is also higher for firms with higher export intensity. Firms that have an internationally recognized quality certification finance a lower portion of their working capital with internal funds and a higher portion of it with bank loans.

In our analysis of the determinants of the share of five types of sources in fixed asset investments financing, we find that larger firms finance a lower portion of their investments with debt received from nonbank financial institutions and funds provided by microfinance institutions, credit cooperatives, money lenders, friends, relatives, etc. A higher portion of investments is financed with purchases on credit from suppliers and advances from customers by group affiliated firms. Export intensive firms finance a lower proportion of their investments with internal funds and a higher proportion of them with purchases on credit from suppliers and advances from customers and other sources such as debt received from nonbank financial institutions and funds provided by money lenders and friends.

The proportion of working capital and fixed asset investments that is financed with internal funds is higher for firms that are older. Firms with a higher percentage of sales made on credit finance a lower proportion of their working capital and investments with internal funds. These firms finance a higher portion of their working capital and investments with bank loans.

The level of financing constraints encountered by the firms may affect the proportion of investments that is financed with each source. Moreover, it may have an indirect impact on the share of each source by its influence on the factors that can affect how investments are financed. Analyzing whether the level of financing constraints the firms face affects the firm level determinants of the composition of financing sources is a suggestion for future research. Finding out the effect of the level of financing constraints on the factors that are expected to affect how investments are financed would also be a valuable contribution to the literature.

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