

Yarba, İbrahim

**Article**

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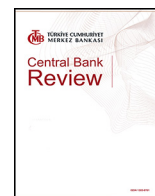
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# Hidden reserves as an alternative channel of firm finance

İbrahim Yarba

Central Bank of the Republic of Turkey, Structural Economic Research Department, Ankara, Turkey



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## ABSTRACT

This study analyses the argument that whether Turkish non-financial firms utilize any informal source of alternative funding during economic uncertainties over the last decade. This study is the first to explore the issue and provide some insights regarding how small and medium-sized enterprises do react to the financial constraint problem in such an economic environment. Both trend analysis and empirical panel model estimations provide supporting evidence that Turkish non-financial firms have some reserves (e.g., owners', relatives' and/or friends' personal wealth) that are utilized during the times of persistent stress and tightening of macroprudential policies. Most strikingly, this is the case for only small and medium-sized enterprises but not for large firms.

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## 1. Introduction

“Many Turkish households and corporates have some hidden reserves that are utilized during time of stress. This is one of the reasons why companies are still showing resilience ...”

(Standard & Poor's, July 17, 2017)

In recent years, Small and Medium-Sized Enterprises (SMEs) have received much attention owing to their significant contributions to economies of both developed and emerging countries. In studying the SME finance, most of the existing research focuses only on the development of markets and banks. However, the recent financial turmoils have brought attention to the concerns related to firms' access to traditional bank lending and market funding, which has been well documented for the case of SMEs in the literature. This reveals the importance of the behavior of SMEs and usage of alternative financing channels during such economic conditions. However, the issue has rarely been discussed in the

literature and evidence is much more limited for emerging economies. In order to provide further evidence to shed some light on this issue for emerging markets, we aim to analyse the case of Turkey, one of the most important emerging countries.

In many emerging countries as in Turkey, bank lending is highly cyclical and vulnerable to financial and economic conditions while equity and bond markets are only accessible to large firms. This suggests that SMEs must sometimes make use of alternative forms of finance in these countries during financial turmoils and economic uncertainties (Allen et al. 2005, 2012a). Trade credit, informal lending and loans from family and friends have been discussed in the literature as the most important sources of alternative finance for bank credit.

Theoretical research in this area (e.g., Burkart and Ellingsen, 2004; Petersen and Rajan, 1994, 1995) suggests that firms tend to use trade credit to complement bank lending when financial conditions tighten and liquidity relatively dries up. In line with this theoretical argument, previous empirical research (e.g., McGuinness et al., 2018; Casey and O'Toole, 2014; Carbo-Valverde et al., 2016; Ferrando and Mulier, 2013; Garcia-Appendini and Montoriol-Garriga, 2013) has provided ample evidence in support for the view that trade credit provides a useful buffer for financially constrained firms.

E-mail address: [ibrahimyarba@gmail.com](mailto:ibrahimyarba@gmail.com).

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However, there has been little emphasis in the literature on alternative financing channels other than trade credit, which can be attributed to data availability. Therefore, a detailed analysis of this issue using data for a representative sample of firms over a long period is especially important for emerging countries. In that sense, the contribution of this study to the current literature is to provide further evidence to shed some light on this issue for emerging markets by utilizing a confidential and comprehensive firm-level data over the last decade.

SMEs have crucial role in Turkish economy over the last decade.<sup>1</sup> However, credit constraints and difficulty in accessing capital have been considered as the two major problems faced by SMEs in Turkey as in many other emerging countries. In their recent studies, [Mutluer Kurul and Tiryaki \(2014, 2016\)](#) show that the credit constraint problem is more severe after the financial crisis, especially for small firms in Turkey. In line with this finding, [Yarba and Guner \(2020a\)](#) show that Turkish SMEs' financial debt ratios, but not that of large firms, decrease when uncertainty of economic environment increases persistently and when macroprudential policies (MPPs) are tightened. In the last decade, domestic and geopolitical uncertainties have played vital roles in Turkey. Accordingly, MPPs have been extensively used to increase the financial stability.<sup>2</sup> However, how SMEs do react to the financial constraint problem in such an economic environment evidenced in the prior studies remains to be puzzling. This study is the first one to explore the issue and provide some insights.

In first place, we do not find any significant evidence regarding the usage of trade credit, which has been mentioned as the most important alternative financial channel in the literature. Thus, in this study our particular focus is the argument that whether Turkish non-financial firms utilize any informal source of alternative funding other than trade credit. In that sense this paper brings additional insight to the research on alternative financing by [Allen et al. \(2005, 2012a, b\)](#). They argue that while traditional financing channels, including financial markets and banks, provide significant sources of funds for firms, alternative financing channels provide an equally important source of funds in fast-growing emerging countries, especially for SMEs. They show that non-state, non-listed firms in China and India rely more on alternative financing channels such as funds from family and friends in order to finance activity.

Accordingly, in their “Banking Industry Country Risk Assessment” report, Standard & Poor's (S&P) argues that many Turkish households and corporates have some hidden reserves that are utilized during times of stress. They claim that this is one of the reasons why Turkish companies are still showing resilience in an uncertain and volatile economic environment of the country. If that is the case, in accordance with the usage of their hidden reserves (e.g., their personal, relatives' and/or friends' personal wealth), some fluctuations are expected in balance sheet components of these firms, namely owners' equity and/or non-financial liabilities. Examining trends in balance sheet components of the sample firms in detail, results reveal that only other non-financial liability component in the balance sheets of the SMEs, but not that of large firms exhibits upward fluctuations during such economic conditions. This component mainly consists of amounts owed to partners and the miscellaneous items, which are neither financial nor trade debt. This suggests that SMEs tend to finance themselves by increasing their other non-financial liabilities, which we argue that

these are owners', relatives' and/or friends' personal wealth (hidden reserves) of these firms. Anecdotal evidence provided from certified public accountants (CPAs) is also consistent with this argument.<sup>3</sup>

Moreover, in order to provide formal evidence for this argument, we also conduct empirical panel models over the sample period. Results show that firms increase their other non-financial liability components when uncertainty is persistently increasing and when macroprudential policy tools are tightened by regulators. Most strikingly, this is the case for only SMEs but not large firms, which provide significant supporting evidence for those in trend analysis.

The remainder of this paper is organized as follows. The dataset and measurements are explained in Section 2, and trend analyses are presented in Section 3. The empirical model and results are reported in Section 4. Finally, concluding remarks are presented in Section 5.

## 2. Data and variables

### 2.1. Variables

This section explains how the macroprudential policy, uncertainty and persistence of uncertainty indices and other variables used in the empirical analyses of this study are constructed.

#### 2.1.1. Uncertainty

Existing literature (e.g., [Caldara et al., 2016](#); [Stock and Watson, 2012](#); [Gilchrist and Zakrajsek, 2012](#)) provide ample evidence that volatility in financial markets can be used as a proxy for economic environment uncertainty. Therefore, following [Yarba and Guner \(2020a\)](#), we create an index of uncertainty for Turkey (UNCI) by using financial variables related with uncertainty. Financial variables used to construct this index are Credit Default Spread (CDS), Bond Market Spread and implied volatilities in Foreign Exchange (FX) market. For bond market spread, the commonly used Emerging Market Bond Index spread (EMBI) for Turkey; for CDS, 5 Year Credit Default Spread in USD for Turkey which has the highest trading volume; for implied volatilities in FX market, 1 month and 1 year implied volatilities of both EUR/TL and USD/TL are used. All data is obtained from Bloomberg on a daily basis over the sample period.

Principal Component Analysis is used to create a daily index for uncertainty. Based on the results of this analysis one single factor is extracted. The eigenvalue of this factor is 5.06 and 84.25% variance of all the variables is explained by this factor, which is relatively high. Since the firm-level data of this study is annual, the average of daily UNCI values are calculated for each year in order to convert daily data into annual data. Alternatively, we also use the financial variables separately in the empirical model instead of the uncertainty index.

#### 2.1.2. Persistence of uncertainty

[Yarba and Guner \(2020a\)](#) argue that reactions of economic agents to uncertainty may depend on whether the uncertainty is perceived to be short-lived or persistent and therefore the persistence of uncertainty might be an appropriate factor that could be

<sup>1</sup> According to most recent report of Turkish Statistical Institute, in Turkey, SMEs' share is 73.5% of total employment, 62% of total sales, 55% of total investments, and 53.5% of total value added.

<sup>2</sup> See [Kara \(2016\)](#) for the details of the implementation of MPPs in Turkey.

<sup>3</sup> A certified public accountant (CPA) is a designation given by the authorized chambers in accordance with the relevant legislation to individuals that pass the CPA Examination and meet the education and experience requirements. CPAs are responsible for the accuracy of financial documents of companies, and they have the authority to inspect and certify the accuracy of financial records and statements submitted to Turkish Revenue Administration on behalf of the government.

taken into account in analysing financial decisions of firms. They also provide empirical evidence supporting their arguments. In order to measure the persistence of uncertainty, they adopt the methodology used by Herrera et al. (2011) and Davis and Haltiwanger (1992). The process is as follow:

$$P\_UNCI_t = \left\{ \begin{array}{l} \alpha \times \min \left\{ 1, \max \left( 0, \frac{\text{percentage change in UNCI between } t \text{ and } t-2}{\text{percentage change in UNCI between } t-1 \text{ and } t-2} \right) \right\}, \quad \text{if } \Delta UNCI_t \times \Delta UNCI_{t-1} > 0 \\ \beta \times \max \left\{ -1, \min \left( 0, \frac{\text{percentage change in UNCI between } t \text{ and } t-2}{\text{percentage change in UNCI between } t-1 \text{ and } t-2} \right) \right\}, \quad \text{otherwise} \end{array} \right. \quad (1)$$

$P\_UNCI_t$  denotes the persistence of uncertainty index (UNCI) in year  $t$ , and  $\alpha$  is  $-1$  if  $\Delta UNCI_t < 0$  and  $1$  otherwise where  $\Delta UNCI_t$  is the percentage change in UNCI between  $t$  and  $t-1$ , and  $\beta$  is  $1$  if  $\Delta UNCI_t < 0$  and  $-1$  otherwise.  $P\_UNCI_t$  takes the values in the interval  $[-1,1]$ . Successive decreases (increases) in uncertainty at  $t-1$  and  $t$  is considered to be persistent decreases (increases) in uncertainty.  $P\_UNCI_t$  gets closer to  $-1$  ( $1$ ) when decrease (increase) in UNCI at time  $t$  is higher relative to decrease (increase) at time  $t-1$ . On the other hand, if UNCI does not decrease (increase) in two successive period,  $P\_UNCI_t$  takes the value of  $0$ , which can be interpreted as no persistence. However, even though UNCI increases (decreases) at time  $t-1$ , if the decrease (increase) at time  $t$  is relatively high that UNCI level at time  $t$  gets below the level at time  $t-2$ , then  $P\_UNCI_t$  does not get the value of  $0$ , but it gets closer to  $-1$  ( $1$ ) depending on the magnitude of the decrease (increase) at time  $t$ .

### 2.1.3. Macroprudential policies

In assessing the performance of MPP framework, the lack of information is the one of the most challenging issues due to the complex nature of policy implementation. MPP framework involves a wide range of tools implemented by various policy-makers. However, a unique and detailed dataset of widely used MPP tools for 64 countries including Turkey is compiled by Cerutti et al. (2016) over the period 2000–2014. Information on commonly used MPP tools is collected under five main categories: (i) capital buffers, (ii) concentration limits, (iii) interbank exposure limits, (iv) loan-to-value ratio limits, and (v) reserve requirements. They provide the primary information directly by national authorities through International Banking Research Network or IMF. As primary sources, they use national authorities' webpages and Global Macroprudential Policy Instruments compiled by IMF (2014). Additionally, they use earlier dataset compiled by Lim et al. (2011), Kuttner and Shim (2013), Akinci and Olmstead-Rumsey (2018) and Reinhart and Sowerbutts (2015) as secondary sources to complement the database. They also construct an index, which reflects the direction of MPPs' usage over time for each country where  $1$  stands for tightening,  $0$  stands for no change, and  $-1$  stands for loosening in MPPs in a given quarter. In this study, we use annual MPI series created by Cerutti et al. (2016) and updated for the year of 2015 by Yarba and Guner (2020a) as a proxy for MPP's usage in Turkey.

### 2.1.4. Other variables

Following Rajan and Zingales (1995), Frank and Goyal (2009), and Yarba and Guner (2020a, 2020b), a large set of firm specific, industry specific, macroeconomic and economic environment factors are included in the empirical models of this paper as control

variables. Calculation and definition of these control variables are straightforward; therefore, they are explained in Table 1.

### 2.2. Data

We utilize a confidential firm-level data in this study provided by the Central Bank of Turkey (CBRT). This comprehensive and representative firm-level data for Turkish non-financial firms is not publicly available for confidentiality reasons while the aggregated reports by company sizes and sectors are released on the CBRT's web site annually.

In contrast to most of the previous studies, our sample does not cover only publicly traded non-financial firms, but also privately held firms. It is also well diversified in terms of firm size. Of the firms included in the sample, 14.46% are large firms, 33.91% are medium, 37.49% are small and 14.14% are micro sized on average. Moreover, SMEs included in our sample account for 27.39% of total net sales, 24.94% of owners' equity, and 28.86% of total assets of all Turkish SMEs covered in the database of Turkish Ministry of Science, Industry and Technology on average over the sample period. The same ratios for large firms in our sample are 48.15%, 56.30%, 54.14%, respectively.

Our sample spans for 9 years over the period 2007–2015.<sup>4</sup> There are on average about 12,943 firms each year, and each of these firms has at least 3 years of consecutive data. In order to minimize the possible effects of outliers, data is winsorized at each tail at 0.5%, and the end result is an unbalanced panel data with 116,484 firm-year observations.<sup>5</sup>

Table 2 reports descriptive statistics for the dependent and independent variables used in this study. Panel A of Table 2 reports the descriptive statistics for the full sample while Panels B and C report the descriptive statistics for SMEs and large firms, respectively. Based on net sales criterion, firms are divided into quartiles by the value of their net sales, and a firm is classified as "large" if it

<sup>4</sup> The study period starts from 2007 due to the availability of the historical implied volatilities in FX market (1 month and 1 year implied volatilities of EUR/TL) used to construct the UNCI and  $P\_UNCI$  indices.

<sup>5</sup> Financial development index used in this study is obtained from Sviryzdenka (2016). Remaining economic environment and macroeconomic variables are obtained from Electronic Data Delivery System (EDDS) of the CBRT, Turkish Statistical Institute and Undersecretariat of Treasury of the Republic of Turkey.

**Table 1**  
Variable definitions.

Variables	Definitions
Uncertainty Index	Index created by <a href="#">Yarba and Guner (2020a)</a> explained in Section 2.1.1.
Persistence of Uncertainty Index	Index created by <a href="#">Yarba and Guner (2020a)</a> explained in Section 2.1.2.
Macroprudential Policy Index	Index created by <a href="#">Cerutti et al. (2016)</a> and authors' own calculations explained in Section 2.1.3.
<b>Dependent Variable</b>	
Other non-financial liabilities to total assets ratio	Other non-financial liabilities divided by total assets
Other non-financial liabilities to total liabilities ratio	Other non-financial liabilities divided by total liabilities
<b>Control Variables</b>	
<b>Firm Characteristics</b>	
Profitability	Operating income divided by total assets
Size	Log of sales deflated by GDP deflator
Growth	Difference in the net sales between current year and previous year divided by the net sales in previous year
Tangibility	Total net plant, property and equipment divided by total assets
Business Risk	Standard deviation of the ratio of operating income to total assets for the last three consecutive years
<b>Industry Specific Factor</b>	
Industry median other non-financial liabilities to total assets ratio	Median of related other non-financial liabilities to total assets ratio of all the firms operating in the same industry as the firm, excluding the firm itself. Sector classification is based on economic activity classification, NACE Rev.2 which is released by EUROSTAT
Industry median other non-financial liabilities to total liabilities ratio	Median of related other non-financial liabilities to total liabilities ratio of all the firms operating in the same industry as the firm, excluding the firm itself. Sector classification is based on economic activity classification, NACE Rev.2 which is released by EUROSTAT
<b>Macroeconomic/Economic Environment Factors</b>	
GDP growth	Percentage change in annual real GDP
Inflation	Difference in the Consumer Price Index between current year and previous year divided by the Consumer Price Index in previous year
Government Borrowing	Government debt divided by GDP
Financial Development	Index created by <a href="#">Sviryzdenka (2016)</a> extended by <a href="#">Yarba and Guner (2020a)</a>

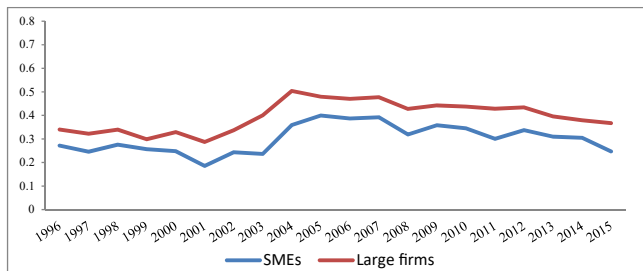
The table reports the definitions of the dependent and the independent variables used in this study.

**Table 2**  
Descriptive statistics.

Variable	Obs	Mean	Sd	1st Quartile	Median	3rd Quartile
<b>Panel A: Full Sample</b>						
Other Liabilities to Total Assets	116,484	7.69	16.51	0.12	0.96	7.08
Other Liabilities to Total Liabilities	116,484	11.22	19.92	0.21	1.77	12.22
Profitability	116,484	4.72	12.39	0.40	4.35	9.20
Firm size	112,477	16.34	2.03	15.46	16.51	17.49
Firm growth	94,722	17.00	97.08	-5.79	12.77	32.10
Tangibility	116,484	27.78	24.57	7.50	21.17	41.78
Firm business risk	79,922	5.46	12.75	1.63	3.27	6.13
Industry median other non-financial liabilities to total assets ratio	180	1.27	0.74	0.80	1.05	1.44
Industry median other non-financial liabilities to total liabilities ratio	180	2.46	1.34	1.55	2.04	2.99
GDP growth	9	5.03	4.67	4.79	5.17	8.49
Inflation	9	8.04	1.56	6.53	8.17	8.81
Government leverage	9	35.89	5.04	32.00	37.00	38.00
Financial development	9	0.49	0.03	0.48	0.49	0.50
Uncertainty Index	9	0.01	0.76	-0.47	-0.04	0.21
Persistence of Uncertainty Index	9	0.02	0.73	-0.30	0.00	0.48
Macroprudential Policy Index	9	0.22	0.42	0.00	0.25	0.25
<b>Panel B: SMEs</b>						
Other Liabilities to Total Assets	87,366	8.74	17.41	0.13	1.14	9.01
Other Liabilities to Total Liabilities	87,366	12.73	21.43	0.21	2.14	15.28
Profitability	87,366	3.85	12.69	-0.03	3.67	8.31
Firm size	83,359	15.58	1.82	15.05	16.03	16.70
Firm growth	68,209	14.63	108.16	-10.49	11.18	32.84
Tangibility	87,366	29.36	25.91	7.47	22.28	45.30
Firm business risk	56,783	5.73	14.65	1.56	3.21	6.20
<b>Panel C: Large firms</b>						
Other Liabilities to Total Assets	29,118	4.29	10.07	0.11	0.63	3.28
Other Liabilities to Total Liabilities	29,118	6.70	13.50	0.19	1.17	5.88
Profitability	29,118	7.33	11.03	2.41	6.35	11.64
Firm size	29,118	18.48	0.91	17.79	18.23	18.92
Firm growth	26,513	23.09	59.36	2.64	15.58	30.89
Tangibility	29,118	23.06	19.30	7.57	18.72	33.57
Firm business risk	23,139	4.79	5.81	1.79	3.38	5.96

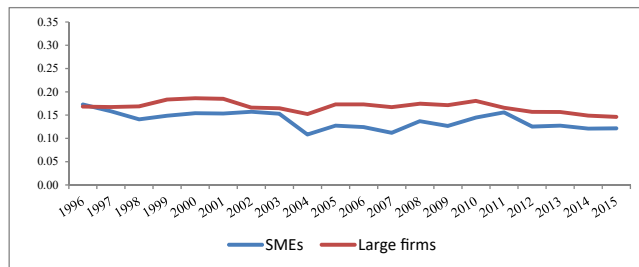
The table reports the descriptive statistics for the dependent and the independent variables used in this study over the period 2007–2015. Panel A reports the descriptive statistics for the full sample, while Panels B and C report the descriptive statistics for SMEs and large firms, respectively. Definitions of variables are given in [Table 1](#). Based on net sales criterion, firms are divided into quartiles by the value of their net sales, and a firm is classified as “large” if it is in the highest net sales quartile and an “SME” otherwise. All variables are expressed as percentages, with the exception of firm size, financial development and other indices.





The blue line and the red line represent yearly aggregated owners' equity to total assets ratios of non-financial firms in the CBRT database from 1996 to 2015 for SMEs and large firms, respectively. Firms are divided into quartiles based on their net sales, and a firm is classified as "large" if it is in the highest net sales quartile and an "SME" otherwise.

Fig. 1. Owners' equity to total assets.



The blue line and the red line represent yearly aggregated total trade debt to total assets ratios of non-financial firms in the CBRT database from 1996 to 2015 for SMEs and large firms, respectively. Firms are divided into quartiles based on their net sales, and a firm is classified as "large" if it is in the highest net sales quartile and an "SME" otherwise.

Fig. 2. Trade debt to total assets.

is in the highest net sales quartile and an "SME" otherwise.<sup>6</sup> Other liabilities to total assets ratio for the whole sample is on average 7.69% while the share of other liabilities in total liabilities is 11.22%. However, both ratios of SMEs are almost two times higher than those of large firms. Moreover, the difference in the variance of firm growth is remarkable between SMEs and larger firms.

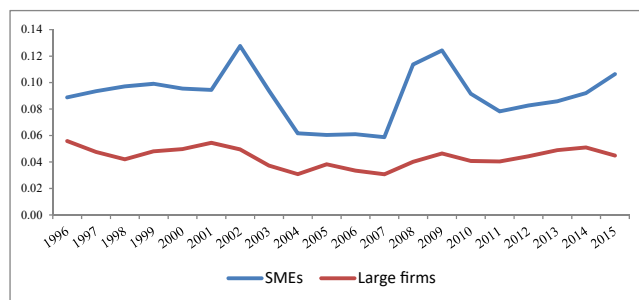
### 3. Analysis of trends in aggregated data

In order to provide insights for the argument presented in the introduction, in this section we examine trends in aggregated balance sheet items in detail. Most strikingly, neither the non-financial liability components with the exception of other non-financial liabilities nor the owners' equity of Turkish non-financial firms exhibit fluctuations during the times of stress and/or the times of macroprudential policy tightening. In order to illustrate, time series of yearly aggregated owners' equity to assets ratio and aggregated trade debt to assets ratio, which is the major non-financial debt liability component, for SMEs and large firms are presented in Figs. 1 and 2, respectively.

In these figures, the blue and the red lines show the ratios for SMEs and large firms, respectively. In Fig. 1, owners' equity to total assets ratio exhibits improvement between 2002 and 2007 for both SMEs and large firms, which is attributable to high growth period of Turkey. However, no fluctuations appear during times of stress or MPPs tightening. This is also the case for trade debt to assets ratio depicted in Fig. 2.

On the other hand, the only non-financial liability that exhibits fluctuations during such economic environment is the other non-financial liability component. Fig. 3 presents time series of aggregated other non-financial liabilities to assets ratio for SMEs (the blue line) and large firms (the red line). The figure reveals two significant peaks for SMEs in which the ratio nearly doubles. The first peak appears during 2001–2002 financial crisis, and the second appears during 2008–2009 financial turmoil. Besides, the ratio has an upward trend 2008–2009, which is the period of MPP tightening.

At this point, it is worthwhile to explain this balance sheet component. According to the Turkish accounting system, other non-financial liability component consists of following items: (i) Amounts Owed to Partnerships/Shareholders, (ii) Amounts Owed to Participations, (iii) Amounts Owed to Affiliated Enterprises, (iv) Amounts Owed to Employees, and (v) Miscellaneous. The

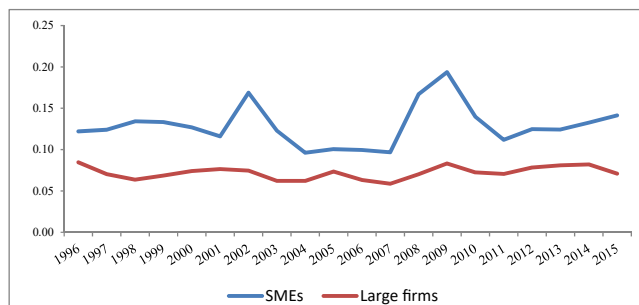


The blue line and the red line represent yearly aggregated other non-financial liabilities to total assets ratios of non-financial firms in the CBRT database from 1996 to 2015 for SMEs and large firms, respectively. In according with Turkish accounting system, other non-financial liability component consists of following items: (i) Amounts Owed to Partnerships/Shareholders, (ii) Amounts Owed to Participations, (iii) Amounts Owed to Affiliated Enterprises, (iv) Amounts Owed to Affiliated Employees, and (v) Miscellaneous. The last miscellaneous items are the accounting entries, which are neither financial debt nor trade debt, and not related with first four other liabilities items. Firms are divided into quartiles based on their net sales, and a firm is classified as "large" if it is in the highest net sales quartile and an "SME" otherwise.

Fig. 3. Other non-financial liabilities to total assets.

miscellaneous items are the accounting entries, which are neither financial debt nor trade debt, and not related with the first four other liability items. Examining these individual components in detail, we discover that the first and the fifth items of other non-financial liability component, namely amounts owed to partnerships and miscellaneous account for the observed fluctuations in this item.

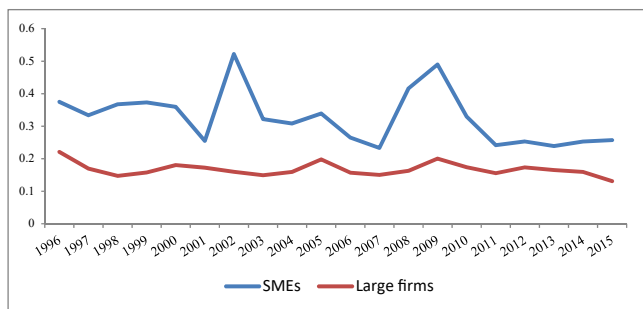
One can argue that other non-financial liability component might not be a significant source of financing, therefore, the aforementioned increases may result in a negligible amount of increase in financing for the firms. In order to analyse this issue, we



The blue line and the red line represent yearly aggregated other non-financial liabilities to total liabilities ratios of non-financial firms in the CBRT database from 1996 to 2015 for SMEs and large firms, respectively. In according with Turkish accounting system, other non-financial liability component consists of following items: (i) Amounts Owed to Partnerships/Shareholders, (ii) Amounts Owed to Participations, (iii) Amounts Owed to Affiliated Enterprises, (iv) Amounts Owed to Affiliated Employees, and (v) Miscellaneous. The last miscellaneous items are the accounting entries, which are neither financial debt nor trade debt, and not related with first four other liabilities items. Firms are divided into quartiles based on their net sales, and a firm is classified as "large" if it is in the highest net sales quartile and an "SME" otherwise.

Fig. 4. Other non-financial liabilities to total liabilities.

<sup>6</sup> Descriptive statistics for SMEs and large firms determined based on number of employees are in line with those reported in Table 2. To conserve space, these results are not reported in the study. However, they are available from the author upon request.



The blue line and the red line represent yearly aggregated other non-financial liabilities to total financial debt ratios of non-financial firms in the CBRT database from 1996 to 2015 for SMEs and large firms, respectively. In accordance with Turkish accounting system, other non-financial liability component consists of following items: (i) Amounts Owed to Partnerships/Shareholders, (ii) Amounts Owed to Participations, (iii) Amounts Owed to Affiliated Enterprises, (iv) Amounts Owed to Affiliated Employees, and (v) Miscellaneous. The last miscellaneous items are the accounting entries, which are neither financial debt nor trade debt, and not related with first four other liabilities items. Firms are divided into quartiles based on their net sales, and a firm is classified as “large” if it is in the highest net sales quartile and an “SME” otherwise.

Fig. 5. Other non-financial liabilities to total financial debt.

calculate time series of aggregated other non-financial liabilities to total liabilities and other non-financial liabilities to financial debt ratios, which are presented in Figs. 4 and 5, respectively. Figures show that other non-financial liabilities reach nearly 20% of total liabilities and above half of total financial debt, indicating that other non-financial liabilities is not a negligible amount and it is a significant source of financing for firms during such economic conditions.

#### 4. Empirical analysis

##### 4.1. Empirical model and results

In order to provide formal evidence, in this section we conduct empirical tests in addition to insights provided by the trend analyses. The empirical model employed in this study is given below:

$$\begin{aligned}
 Y_{it} = & \alpha_0 + \alpha_1 \times P\_UNCI_t + \alpha_2 \times UNCI_t + \alpha_3 \times MPI_t \\
 & + \sum_k \gamma_k F_{k, it-1} + \sum_l \beta_l I_{l, it} + \sum_m \delta_m EE_{m, it} + \sum_n \theta_n X_{n, it} \\
 & + \mu_i + \varepsilon_{it}
 \end{aligned}
 \tag{2}$$

where dependent variable,  $Y_{it}$  denotes other non-financial liabilities/total assets or other non-financial liabilities/total liabilities for firm  $i$  in year  $t$ .  $MPI$ ,  $UNCI$ , and  $P\_UNCI$  are the variables of interest denoting macroprudential policy, uncertainty and persistence of uncertainty indices, respectively.  $F$  is the vector of firm characteristics while  $I$  is the industry specific control variables.  $EE$  denotes the proxies for economic environment and  $X$  is the macroeconomic control variables defined in Table 1.  $\mu_i$  is (unobservable) time invariant firm specific effect, and  $\varepsilon_{it}$  is the idiosyncratic error term. In order to examine the role of firm size, we also incorporate  $UNCI \times SIZE$ ,  $P\_UNCI \times SIZE$  and  $MPI \times SIZE$ , the interactions terms between firm size and uncertainty, persistence of uncertainty and macroprudential policy, respectively. For robustness, we also re-estimate the model by excluding industry specific controls and time variant variables and incorporating the interactions terms. This allows us to include year, region x year and sector x year fixed effects to the model to control time fixed effects and any time variant unobservable region and industry factors.

Table 3 presents estimation results of the empirical model in equation (2) for the full sample. In column 1, we do find that persistence of uncertainty is positively associated with other non-financial liability ratio. The coefficient of  $P\_UNCI$  is highly

significant at 1% level. On the other hand, no significant relationship between  $UNCI$  and other non-financial liability ratio is observed after controlling for a large set of variables consisting of firm specific, industry specific, and other related macroeconomic variables. Besides, we do find that macroprudential policy index is significantly positively associated with other non-financial liability ratio. A small number of firms move between provinces and sectors, thus, in addition to firm fixed effects, we also include sector and province fixed effects into the model. Controlling these fixed effects does not alter our results (Columns 2 and 3). These results suggest that firms increase their other non-financial liability components when uncertainty is persistently increasing and when macroprudential policy tools are tightened by regulators.

In order to examine the role of firm size on these significant associations, we incorporate  $UNCI \times SIZE$ ,  $P\_UNCI \times SIZE$  and  $MPI \times SIZE$ , the interactions terms between firm size and uncertainty, persistence of uncertainty and macroprudential policy, respectively. The coefficients of both interaction terms,  $MPI \times SIZE$  and  $P\_UNCI \times SIZE$  are significant and negative (columns 4 to 6). For robustness, we also re-estimate the models by excluding industry specific controls and time variant variables (all macroeconomic and economic environment factors) and incorporating the interactions terms. This allows us to include year, sector x year and region x year fixed effects to the model to control time fixed effects and any possible omitted region and industry factors (time variant unobservable region and industry factors). The coefficients of both  $MPI \times SIZE$  and  $P\_UNCI \times SIZE$  remain significant and negative (columns 7 to 16). These robust relations suggest that the positive associations between the usage of non-financial liabilities and either  $MPI$  or  $P\_UNCI$  are increasing with the decrease in firm size.

For robustness, we re-estimate panel regressions for SMEs and large firms separately in order to examine whether the associations differ among firms with different sizes. Results are reported in Table 4.

We use two alternative classification schemes to classify firms as SMEs and large firms. First, a firm is classified as an “SME” if its number of employees is less than 250, and “large” otherwise (Panel A). Second, firms are divided into quartiles by the value of their net sales, and a firm is classified as “large” if it is in the highest net sales quartile and an “SME” otherwise (Panel B). Results reveal that both  $MPI$  and  $P\_UNCI$  are positively associated with other non-financial liability ratios of SMEs (Columns 1 and 3). However, relationships are not robust for neither  $MPI$  nor  $P\_UNCI$  for large firms (Columns 2 and 4), which are in line with those reported in Table 3.

As an additional robustness check for this asymmetric relationship for SMEs and large firms reported in Table 4, we re-estimate the models with the share of other non-financial liabilities (other non-financial liability to total liabilities) as the dependent variable instead of other non-financial liability ratio (other non-financial liability to total assets). Estimations are reported in Table 5.

Results show that macroprudential policy and persistence of uncertainty indices are positively associated with the share of other non-financial liabilities in total liabilities, as well. In line with estimates reported in Tables 3 and 4, these significant relationships are valid for SMEs (columns 2 and 4) but not for large firms (columns 3 and 5). These suggest that both other non-financial liability to total assets and other non-financial liabilities to total liabilities ratios of SMEs increase when uncertainty is increasing persistently and also when macroprudential policy is tightened during the sample period while no such relationship appears for large firms.

In Turkey, as in many other emerging countries credit constraints and difficulty in accessing capital have been considered as the two major problems faced by SMEs (Mutluer Kurul and Tiryaki, 2014, 2016). Accordingly, Yarba and Guner (2020a) provide

**Table 3**  
Other non-financial liabilities ratio, macroprudential policies and uncertainty.

	Other Liabilities/Total Assets															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
P_UNCI	0.017*** (0.006)	0.017*** (0.006)	0.017*** (0.006)	0.056*** (0.017)	0.056*** (0.017)	0.056*** (0.017)										
UNCI	-0.002 (0.003)	-0.002 (0.003)	-0.002 (0.003)	-0.005 (0.016)	-0.005 (0.016)	-0.005 (0.016)										
MPI	0.009*** (0.003)	0.009*** (0.003)	0.009*** (0.003)	0.048** (0.019)	0.048** (0.019)	0.048** (0.019)										
P_UNCI x Size				-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.001** (0.000)		-0.002** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.001** (0.000)		-0.002* (0.001)	-0.002*** (0.001)	-0.002*** (0.001)
UNCI X Size				0.000 (0.001)	0.000 (0.001)	0.000 (0.001)		-0.000 (0.000)	0.001 (0.001)		0.000 (0.001)		-0.001 (0.001)	0.001 (0.001)		0.000 (0.001)
MPI x Size				-0.002** (0.001)	-0.002** (0.001)	-0.002** (0.001)				-0.002** (0.001)	-0.002** (0.001)					-0.002** (0.001)
Size	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)	-0.004*** (0.002)
Constant	-0.113 (0.076)	-0.113 (0.076)	-0.113 (0.076)	-0.135* (0.078)	-0.135* (0.078)	-0.135* (0.078)	0.122*** (0.026)	0.122*** (0.026)	0.120*** (0.026)	0.130*** (0.027)	0.129*** (0.027)	0.138*** (0.026)	0.139*** (0.026)	0.136*** (0.026)	0.146*** (0.027)	0.146*** (0.027)
Firms Specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Specific controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
Macroeconomic/economic environment controls	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	No	No	No	No
Province fixed effects	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector fixed effects	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector x year fixed effects	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Province x year fixed effects	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076	52,076
R-squared	0.768	0.768	0.768	0.769	0.769	0.769	0.768	0.768	0.768	0.769	0.769	0.775	0.775	0.775	0.775	0.775

The table presents results of empirical panel model in equation (2) for the full sample. Dependent variable is other non-financial liabilities to total assets ratio of firm  $i$  in year  $t$ ; *UNCI*, *P\_UNCI* and *MPI* are the variables of interest denoting uncertainty, persistence of uncertainty, and macroprudential policy indices, respectively. Definitions of firm and industry specific control variables and macroeconomic/economic environment controls are given in Table 1. Robust standard errors clustered at firm level are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels is indicated by \*\*\*, \*\*, and \*, respectively.



**Table 4**  
SMEs vs large firms.

	Other Liabilities/Total Assets			
	Panel A		Panel B	
	SMEs	Large firms	SMEs	Large firms
	(1)	(2)	(3)	(4)
P_UNCI	0.021*** (0.007)	0.002 (0.009)	0.025*** (0.008)	0.002 (0.007)
UNCI	0.000 (0.004)	-0.008 (0.006)	-0.003 (0.005)	0.001 (0.005)
MPI	0.010** (0.004)	0.006 (0.006)	0.014*** (0.005)	0.005 (0.004)
Constant	-0.156* (0.095)	0.073 (0.132)	-0.202* (0.111)	-0.025 (0.102)
Firms Specific controls	Yes	Yes	Yes	Yes
Industry Specific controls	Yes	Yes	Yes	Yes
Macroeconomic/economic environment controls	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observations	41,191	10,885	34,697	17,379
R-squared	0.788	0.660	0.794	0.679

The table presents results of empirical panel model in equation (2) for the full sample. Dependent variable is other non-financial liabilities to total assets ratio of firm *i* in year *t*; UNCI, P\_UNCI and MPI are the variables of interest denoting uncertainty, persistence of uncertainty, and macroprudential policy indices, respectively. Definitions of firm and industry specific control variables and macroeconomic/economic environment controls are given in Table 1. In Panel A, a firm is classified as an “SME” if its number of employees is less than 250, and “large” otherwise. In Panel B, firms are divided into quartiles based on their net sales, and a firm is classified as “large” if it is in the highest net sales quartile and an “SME” otherwise. Robust standard errors clustered at firm level are reported in parentheses. Statistical significance at the 1%, 5%, and 10% levels is indicated by \*\*\*, \*\*, and \*, respectively.

**Table 5**  
Share of other non-financial liabilities, macroprudential policies and uncertainty.

	Other Liabilities/Total Liabilities				
	Full sample	Panel A <sup>a</sup>		Panel B <sup>a</sup>	
		SMEs	Large firms	SMEs	Large firms
	(1)	(2)	(3)	(4)	(5)
P_UNCI	0.013* (0.008)	0.020** (0.009)	-0.005 (0.012)	0.023** (0.011)	-0.006 (0.010)
UNCI	0.002 (0.004)	0.004 (0.005)	-0.007 (0.007)	0.001 (0.006)	0.005 (0.006)
MPI	0.009** (0.005)	0.012** (0.006)	0.006 (0.007)	0.015** (0.007)	0.003 (0.006)
Constant	-0.036 (0.101)	-0.105 (0.125)	0.141 (0.172)	-0.120 (0.147)	0.063 (0.136)
Firms Specific controls	Yes	Yes	Yes	Yes	Yes
Industry Specific controls	Yes	Yes	Yes	Yes	Yes
Macroeconomic/economic environment controls	Yes	Yes	Yes	Yes	Yes
Province fixed effects	Yes	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	52,076	41,191	10,885	34,697	17,379
R-squared	0.749	0.763	0.713	0.768	0.700

The table presents results of empirical panel model in equation (2) for the full sample. Dependent variable is other non-financial liabilities to total liabilities ratio of firm *i* in year *t*; UNCI, P\_UNCI and MPI are the variables of interest denoting uncertainty, persistence of uncertainty, and macroprudential policy indices, respectively. Definitions of firm and industry specific control variables and macroeconomic/economic environment controls are given in Table 1. In Panel A, a firm is classified as an “SME” if its number of employees is less than 250, and “large” otherwise. In Panel B, firms are divided into quartiles based on their net sales, and a firm is classified as “large” if it is in the highest net sales quartile and an “SME” otherwise. Robust standard errors clustered at firm level are reported in parentheses. Statistical significance at the 1%, 5%, and 10 % levels is indicated by \*\*\*, \*\*, and \*, respectively.

significant evidence that in contrast to large firms, SMEs' financial debt decreases when uncertainty of economic environment increases persistently and when macroprudential policy tools are tightened by regulators. Results of this study provide some insights regarding how SMEs do react to such economic environments. Results suggest that SMEs tend to finance themselves by increasing

their other non-financial liabilities, which are neither financial nor trade debt. This provides supporting evidence to the argument that corporates have some hidden reserves (e.g., owners', relatives' and/or friends' personal wealth) that are utilized during times of stress (S&P, 2017), which is also in line with the anecdotal evidence provided from CPAs. These findings are also consistent with the

existing literature indicating that SMEs must sometimes make use of alternative forms of finance in most of emerging countries during economic uncertainties since bank lending is highly cyclical and vulnerable to economic conditions in these countries. In particular, results brings additional insights to Allen et al. (2005, 2012a, b) that emphasize the importance of alternative financing channels other than trade credit in emerging countries, and show that non-state, non-listed firms in China and India rely more on alternative financing channels such as funds from family and friends in order to finance activity.

#### 4.2. Additional robustness

In order to achieve further confirmation that our results are robust, we perform a number of additional checks.<sup>7</sup> First, we winsorize the data in two alternative ways (1% and 5% in each tail) to avoid the possibility whether our results are driven by outliers. Estimated coefficients with these alternative winsorized data are qualitatively and quantitatively very similar with those in reported in Section 4. This suggests that outliers in our dataset are not a significant problem for estimates reported in Section 4.

Besides, instead of the uncertainty index, we re-estimated the empirical model by including financial variables related with uncertainty, separately as an explanatory variable. For bond market spread, the commonly used Emerging Market Bond Index spread for Turkey; for Credit Default Spread, 5 Year CDS in USD for Turkey, which has the highest trading volume; for implied volatilities in FX market, 1 month and 1 year implied volatilities of both USD/TL and EUR/TL are used. Results are in line with those reported in Section 4.

Small and medium sized firms are more likely to be family-owned firms in contrast to large firms. The partnerships and directors of these family-owned firms are more likely to be relatives or family members. Thus, usage of owed to partnerships component in their balance sheets as a non-financial liability might differ for these firms. However, dataset does not provide information on whether a firm is family-owned. Nonetheless, in order to control for the possible bias that might be induced by family-owned firms and usage of amounts owed to partnerships, we re-estimate the empirical models by excluding amounts owed to partnerships and use only miscellaneous item for other non-financial liability as the dependent variable. The miscellaneous items are the accounting entries, which are neither financial debt nor trade debt, and not related with the other liability items such as amounts owed to partnerships/shareholders, participations, affiliated enterprises and employees. In other words, the miscellaneous items are the others of other liabilities. Results show that our findings our robust to alternative measurements of other non-financial liabilities.

Moreover, in order to examine whether any bias induced by firm entry or exit, all model specifications are re-estimated for the firms that have at least T years of consecutive data, where  $T \in [4, 9]$ .  $T = 3$  corresponds to the original sample utilized in this paper. No bias due to entry and/or exit is evident in results.

#### 5. Concluding remarks

Despite the importance of the behavior of SMEs and usage of alternative financing channels during economic uncertainties and financial turmoils, the issue has rarely been discussed in the literature and evidence is much more limited for emerging economies. In order to provide further evidence to shed some light on this issue for emerging markets, we examine the case of Turkey, one of the

<sup>7</sup> To conserve space, these results are not reported in the paper. However, they are available from the author upon request.

most important emerging economies by utilizing a confidential and comprehensive firm-level data over the last decade.

In particular, we analyse the argument that whether Turkish non-financial firms utilize any informal source of alternative funding other than trade credit during economic uncertainties over the last decade. Conducting trend analyses and empirical panel models, we provide some insights regarding how SMEs do react to the financial constraint problem in such an economic environment evidenced in the prior studies (e.g., Yarba and Guner, 2020a; Mutluer Kurul and Tiryaki, 2014, 2016). We provide supporting evidence to the argument that Turkish non-financial firms have some reserves (e.g., owners', relatives' and/or friends' personal wealth) that are utilized during the times of persistent stress and tightening of macroprudential policies. Most strikingly, this is the case for only small and medium-sized enterprises but not for large firms.

Findings of this study bring additional insight to the research on alternative financing. Allen et al. (2005, 2012a,b) argue that alternative financing channels other than trade credit such as funds from family and friends provide an equally important source of funds as traditional financing channels, including financial markets and banks in fast-growing emerging countries, especially for SMEs. Findings of this study also provide support for the findings of previous research regarding the financial constraints on SMEs (e.g., World Bank, 2011; Mutluer Kurul and Tiryaki, 2016). Accordingly, OECD (2015) argue that even though bank financing is important for the SME sector, it is necessary to broaden the range of financing instruments available to SMEs, in order to enable them to continue to play their crucial role in the economy. In Turkey, SMEs' dominant source of external finance is bank lending, and external financing alternative to straight bank debt is quite limited. However, as in many emerging countries, bank lending is highly cyclical and vulnerable to financial and economic conditions, and equity and bond markets are only accessible to large firms. This might lead SMEs to exhibit excessive precautionary behaviors (e.g., excessive dividend payouts, reduction in the responsiveness to investment opportunities), which limit their potential in the economy. In that sense, results of this study shed light on the importance of understanding the behaviour and coping mechanisms of SMEs and developing appropriate policies to improve the financial deepening and broaden the financing instruments available to SMEs as alternatives to the straight bank debt.

#### Declaration of competing interest

There is no conflict of interest.

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