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Short-term working allowance and firm risk in the post-COVID-19 period: Novel matching evidence from an emerging market

Ömer Tuğsal Doruk [a,b,*], Serhat Konuk [c], Rümeysa Atici [c]

[a] GLO Fellow, GLO, Essen
[b] Faculty of Business, Adana Alparslan Türkeş Science and Technology University, Adana, Turkey
[c] Department of Business, Adana Alparslan Türkeş Science and Technology University, Adana, Turkey

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ABSTRACT

In the present study, we examine the effect of government fiscal policy on firm risk in the post-COVID-19 period for an emerging market: Turkey. By doing so, we utilize a propensity score matching method to examine the effect of the short-term working allowance, which is a unique short-term COVID-19 mitigation policy for the Turkish economy, on firm risk. The obtained findings show that the effect of short-term working allowances on firm risk is efficient at mitigating the effect of COVID-19. Our results are also robust as to different robustness checks.

1. Introduction

The present study is to contribute to the current COVID-19 literature which has been growing since the onset of COVID-19 (Albulescu, 2021; Ashraf, 2020; Cepoi, 2020; Corbet et al., 2020b; Zaremba et al., 2020; Zhang et al., 2020), however; there is very limited literature on the relationship between corporate finance and COVID-19 (see the works of Shen et al., 2020; Xiong et al., 2020; Gu et al., 2020; He et al., 2020). As far as we know, there is no study on the link between short-term fiscal policies and corporate finance in developing economies, although we know that the *Finance Research Letters* is a central research hub for the COVID-19 related financial economics literature (see Akhtaruzzaman et al., 2020; Albulescu, 2021; Espinosa-Méndez and Arias, 2021; Azimli, 2020; Caferra and Vidal-Tomás, 2021; Cepoi, 2020; Ciner, 2021; Conlon and McGee, 2020; Corbet et al., 2020a, b; Dima et al., 2021; Goodell, 2020; Hu et al., 2021; Kinateder et al., 2021; Le et al., 2020; Li et al., 2021; Liu et al., 2021; Lyócsa et al., 2020; Mazumder and Saha, 2021; Mazur et al., 2021; Narayan et al., 2021; Sène et al., 2021; Shehzad et al., 2020; Topcu and Gulal, 2020; Wan et al., 2021; Wasiuzzaman and Haji Abdul Rahman, 2021; Zaremba et al., 2020; Zhang et al., 2020).

SARS Nov-2 or the Coronavirus (COVID-19), emerged for the first time in December 2019 in Wuhan, China, and spread outside of Wuhan due to its very high reproduction value (see Lin et al., 2020). The coronavirus was declared a pandemic disease by the World Health Organization (WHO) on March 11, 2020. Due to the high spreading rate of the coronavirus, many workplaces have temporarily

* Corresponding author.
E-mail addresses: otdoruk@atu.edu.tr (Ö.T. Doruk), skonuk@atu.edu.tr (S. Konuk), ratici@atu.edu.tr (R. Atici).

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Table 1
The variables and their measurement method in the present study.

Variable	Measurement method	Source
Demand denotes the changes in demand (i.e represents the demand shock for the firms)	The difference between the current sales (in 2020Q2) and previous sales (in 2020Q1). The quarterly data are used.	Annual reports and Refinitiv Database
Size (represents the firm size)	Natural logarithm of total assets.	Annual reports and Refinitiv Database
Lev (represents the firm leverage). The outcome variable of the psm estimation.	Total liabilities over total assets.	Annual reports and Refinitiv Database
SWG (represents the short-term working allowance dummy)	Short-term working allowances are picked as 1 if a firm takes the short-term working allowance, otherwise 0.	SWG variable is hand collected.
Sector dummies	To control the heterogeneous effect of COVID-19 on the firm dynamics	Annual reports and Refinitiv Database
City dummies (in Robustness Check)	To control the heterogeneous and local effects of COVID-19 cases on the firm dynamics	Annual reports and Refinitiv Database
CF/A (in Robustness Check)	Profitability, which is measured as the profitability as of total assets.	Annual reports and Refinitiv Database

Table 2
Descriptive statistics.

Variable	Observation	Mean	Standard Deviation	Minimum	Maximum
SWG	324	0.1636	0.3705	0	1
Lev	298	0.5761	0.2713	0.0087	1.3860
Demand	291	-0.1056	0.4303	-1.0000	1.4984
Size	299	20.4403	1.8608	16.6786	25.8560

Notes: Table 2 depicts the descriptive statistics for each of the variables used in the study: SWG = Short-term Working Allowance, Lev = Firm Leverage, Demand = The Change in Demand, Size = Firm Size. Except SWG variable, all the variables measured in TL (Turkish Lira). For the measurement details of the variables, see Table 1.

stopped their activities completely or partially[1]. To reduce the losses of workers and employers due to COVID-19 in Turkey and to provide economic support, a short-term working allowance has been implemented. Short-term working is defined as the temporary or partial cessation of activity in the workplace or a reduction of at least one-third of the weekly work time. In cases where the work is reduced due to general economic crises and compelling reasons, the short-term working allowance provides temporary income to the worker as well as reducing temporary labor costs to the employer (Uğraş, 2014, p. 67). Therefore, to partially reduce the negative effects of the pandemic on business life, companies can apply for the short-term working allowance. We also check the audit reports of several public companies in Turkey with reference to the coronavirus pandemic since the coronavirus has negative effects on the operations and cash flows of businesses in the Turkish economy. It can be stated that the coronavirus has an impact on the customer's order which has been interrupted by the coronavirus, especially the supply of raw materials and semi-produced goods. Such supply chain problems put pressure on turnover, and decreased production and sales significantly, thus causing uncertainties with going-concerns in the post-COVID-19[2] period. In this context, it is seen that the implementation of the short-term working allowance is beneficial for the employers to continue their activities, and can decrease the firm's risk. Firm risk is one of the indicators that measure the failure of the business, and we, therefore, use firm risk to examine the mitigating effect of the short-term working allowance on firm risk.

The present study uses a novel dataset for the COVID-19 related firm risk examination for the Turkish economy since we hand-collected the short-term working allowances from the firm-level disclosures, and propensity score matching estimation which has not been used before in Turkey related COVID-19 literature. We utilize the propensity score matching method to determine the connection between short-term working allowance on firm risk in a comparative way. The obtained findings from the propensity score matching method and show that the relationship between short-term working allowance and firm risk is relatively negative in the post-covid-19 period for Turkish non-financial firms.

The remainder of the present study is organized as follows. The following part gives information about the data and methodology. The third part gives the estimation results and discussion. The final part gives a general conclusion.

[1] Since there has been no full lockdown in the Turkish economy, the effect of lockdown on firm performance is not a significant issue. The lockdowns are mainly implemented on weekends in Turkey, and therefore, we can easily say that the firm-level risk is not based on the lockdowns in the Turkish economy.

[2] We use coronavirus and COVID-19 interchangeably in the present study.

Table 3
Correlation matrix across covariates.

Variables	SWG	Size	Demand
SWG	1		
Size	-0.1150	1	
Demand	-0.2078	-0.0131	1

Notes: Table 3 reports the correlation coefficient between variables as used in the study. As can be seen above, there is a negative relationship between short-term working allowance and firm size. Similarly, it is seen that the allowance and the demand changes are negatively correlated. For the variable description, see Appendix.

2. Data and methodology

Except for the short-term working allowance variable, the dataset used in the present study comes from the *Refinitiv* database. The short-term working allowances information is hand collected from the financial reports and financial statements. Table 1 shows the variables and their measurement method, which is used in the present study.

Table 2 gives the descriptive statistics for the variables used in the analysis including the number of observations, mean, standard deviations, minimum and maximum values. Among the 324 firms in our sample, 53 firms benefited from the short-term working allowance. The mean leverage is 0.57, the mean change in demand is about -0.10, and the mean firm size is 20.44 for the sample.

Table 3 presents the correlation matrix for the variables which are used in the study. According to Table 3, there is no multi-collinearity between the independent variables in the econometric model.

In the present study, the propensity score matching methodology is preferred for examining the effect of the short-term working allowance on firm risk in Turkish non-financial firms. The time dimension is taken as the first quarter in which the first COVID-19 confirmed case is seen in the Turkish economy.

We use firm leverage as our outcome variable. As usual, the propensity score matching analysis has two steps. In the first step, a logit model is utilized to estimate the probability of obtaining/receiving a short-term working allowance. In the logit model, we use a set of covariates that can have an effect on the taking of short-term working allowance. The covariates are firm size, sector dummies to control unobservable sectoral differences, and change in sales as a proxy of demand shocks of the COVID-19[3]. The treatment group is firms that get the short-term working allowance, whereas the firms that do not is the control group. As Doruk and Pastore (2020) point out, the matching of the control to the target group is obtained using the estimated propensity scores of the two groups and selecting the firms with the closest propensity score, which results in a control group with the same characteristics as the target group. We can write the PSM method that we conduct as follows:

$$Lev = \beta X + \delta + \varepsilon \tag{1}$$

which has a number of firm-level characteristics (X) and an error term (ε). δ gives the relative leverage reduction of the firms that get the short-term working allowance (or the propensity scores) in the post-COVID-19 period. This is the first step of the logit model in which G takes the value one if a firm takes short-term working allowance and zero if not.

$$G^{*} = \gamma^{'}\varphi + u \tag{2}$$

where:

$$G = 1 \; if \; G^{*} > 0, 0 \; otherwise$$

In Eq. (2), ϕ represents our covariates that are firm size and change in demand. Eq. (3) identifies the final Average Treatment Effect on Treated (ATeT) estimation in the second step. Note that ATeT shows that

$$E(Y_1 - Y_0|D = 1) = E(Y_1|D = 1) - E(Y_0|D = 1) \tag{3}$$

where Y_1 is the treatment group (the firms who have the short-term working allowances) and Y_0 is the control group (the firms that do not have the short-term working allowances). The novel idea behind this estimation procedure is that the coefficient of the treatment variable in reducing the leverage of the firm gives what we define as the coefficient as 'the relative short-term working allowance effect' based on the ATeT.

[3] In the current literature, numerous studies used sales growth as a demand based performance measurement, (see Chauvet and Jacolin, 2017; He and Wong, 2004; Kim et al., 2015).

Table 4
The estimation results.

	Coefficient(s.e)	N
Panel A: Model I (Main Model) Outcome Variable: Firm Leverage ATeT	-0.14 (0.08)	Total=240, Treated firms=48, Firms in control group=192
Panel B: Model II Outcome Variable: Firm Leverage, the model with additional control variables ATeT	-0.03 (0.10)	Total=204, Treated firms=43, Firms in control group=161
Panel C: Model III Outcome Variable: Firm Leverage, the model with additional control variables ATeT	-0.06 (0.07)	Total=240, Treated firms=48, Firms in control group=192

Note: Table 4 depicts the ATeT results that are based on the psm method. The estimations are based on the bootstrapped standard errors with 50 replications. The parentheses show the bias corrected bootstrapped standard errors. All the coefficients are statistically significant at a 5% statistical significance level. Bias corrected critical value intervals: For Model I: -0.24 and -0.11, for Model II: -0.23 and 0.22, and for Model III: -0.23 and 0.22. For the variable description, see Appendix.

3. Estimation results

The obtained findings show that the effect of short-term working allowances on the firm risk is negative. In other words, the short-term working allowance decreases the firm risk in the post-COVID-19 period in the short-run. The average treatment effect on treated (ATeT) results show that the firms that use the short-term working allowance have 15% less risk than the firms without the short-term working allowance in the short-run. As a robustness check, we add the dummy variables for each firm's city/location to control the heterogenous COVID-19 effect (more than 40% of the COVID-19 cases are based on Istanbul in Turkey)[4], and the cash flow to assets ratio[5] is added to control the internal finance option for the firms. The ATeT estimation for the econometric model in which the outcome variable shows the main model results are robust. Those estimations are also significant at a 5% statistical significance level. In addition to the main model results, we use current liabilities to total assets ratio, as a measurement of firm insolvency in the short-term in the post-COVID-19 period. The first step of the psm is the same as our main model, however; in the second step, the outcome variable is current liabilities as of total assets. The ATeT estimations of this psm model are given in Table 4 under model 3. The obtained findings from this model show that the effect of the short-term working allowance on the current assets to total assets ratio is positive. The firms that receive the short-term working allowance have relatively lower short-term insolvency problem than others without the short-term working allowance. The coefficient of ATeT is lower than that of the main model which is based on total liabilities to assets ratio, which shows the effect of the short-term working allowance on the short-term leverage (or insolvency) is lower than its long-term effect on the leverage.

4. Conclusion

In this paper, we examine the effect of the short-term working allowance on firm risk in an emerging country in the post-COVID-19 period. For this purpose, we collect data for short-term working allowance by hand for Turkish non-financial firms. Subsequently, we investigate the relationship between short-term working allowance on the firm risk by using the propensity score matching estimation. The main conclusion that can be drawn from this work is that the relationship between short-term working allowance and firm risk is significantly negative in the post-covid-19 period for Turkish non-financial firms. In light of the findings of the mitigating effect of short-term working allowance on firm risk, we suggest that the utilization of government supports provides better firm performance in the short-run.

This effect can have important implications for policymakers in the post-COVID-19 period. We recommend that a short-term working allowance is an effective tool for the liquidity needs of the firms in the short-term stemming from the COVID-19 related problems, especially for demand related shocks, and the fear factor effect. Otherwise, the lockdown effect leads to long-lasting damage to cash flows due to shrinking demand. Policymakers can use the stimulus packages for employees and employers, such as a short-term working allowance, to mitigate the effect of COVID-19, and to prevent a potential economic recession.

The use of the short-term working allowance in this study is thought to be novel since it has not been used previously for examining the effects of policy interventions on firm performance in the Turkish non-financial firms. However, some limitations should be

[4] The spreading of coronavirus is not homogenous in Turkey, and we use therefore the city dummies to control the unobservable heterogenous COVID-19 effect on the firm risk.

[5] It is known that cash flow is the main vein of financial insolvency during the external shocks in the current literature (Fazzari et al., 1988).

acknowledged. The first limitation relates to the time dimension: we use only one quarter to examine the immediate short-term working allowance effect on firm performance. However, the method is very practical and suitable for our main hypothesis that concentrates on the effect of a short-term working allowance on the firm risk in the immediate shock period of the COVID-19 since the COVID-19 is counted as a "black swan" (see Goodel, 2020). The second and last limitation relates to the dataset that includes only an emerging market. Further investigation is needed for the generalizability of our findings by using different market data.

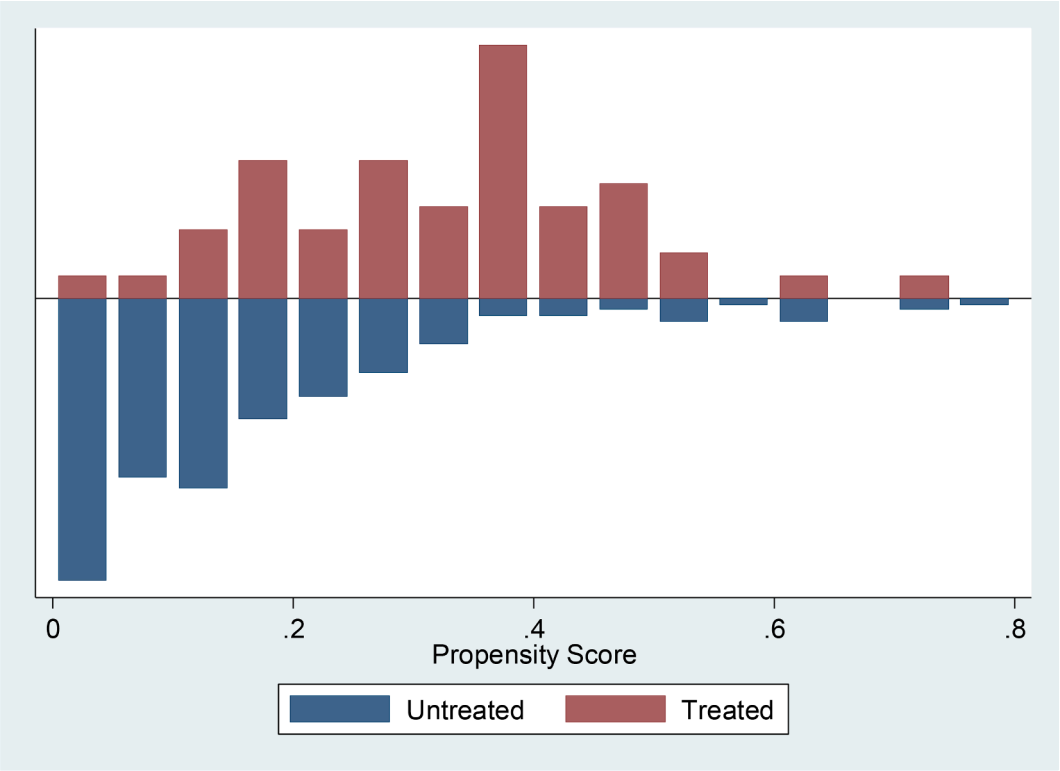

Fig. A1. PSM Scores for treated and untreated firms (outcome variable: leverage).

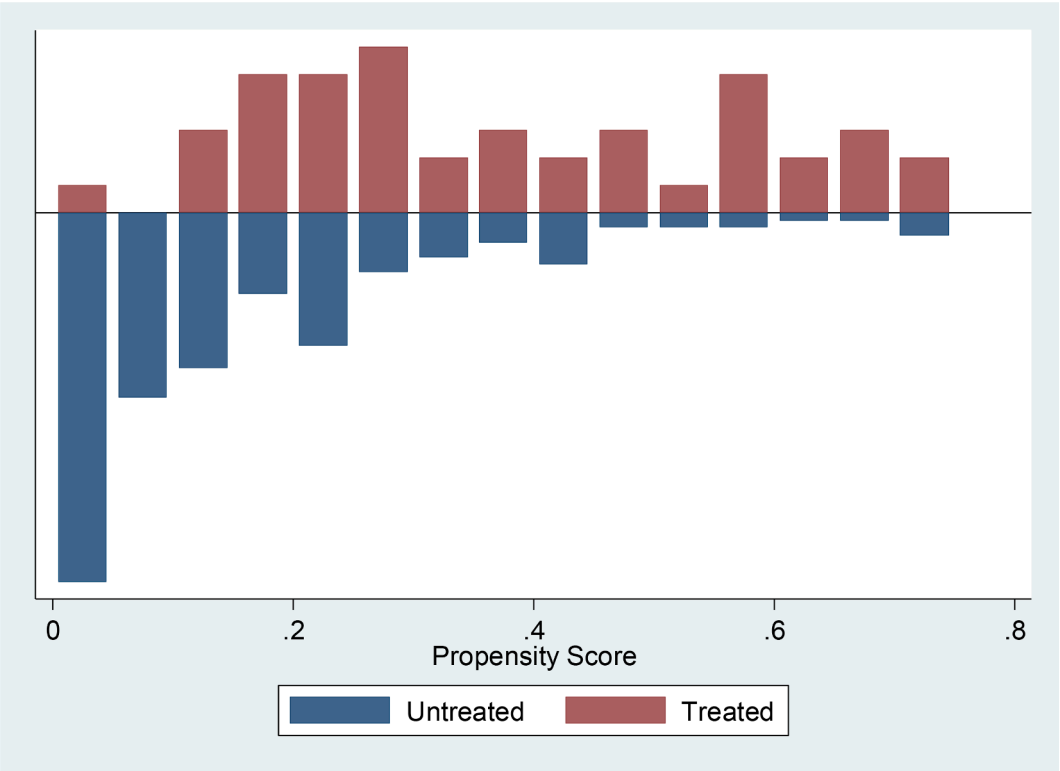

Fig. A2. PSM Scores for treated and untreated firms (outcome variable: leverage) with additional control variables (city dummies and internal finance variables).

Table A1
Difference analysis after PSM.

Variable	Mean Treated	Control	%bias	*T*-test *t* stat.	*p*>*t*
Size	20.015	19.719	17.6	1.00	0.320
Demand	-0.30	-0.22	-22.5	-1.22	0.227

Note: The *T*-Test for the sector-level dummies also shows that there is no difference after the psm estimations. For the variable description, see Appendix.

CRediT authorship contribution statement

Ömer Tuğsal Doruk: Conceptualization, Methodology, Software, Supervision, Writing – original draft. **Serhat Konuk:** Data curtion, Writing – original draft. **Rümeysa Atici:** Data curtion, Writing – original draft.

Appendix. Diagnostic tests of the PSM estimations

Figs. A1, A2 and Table A1

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