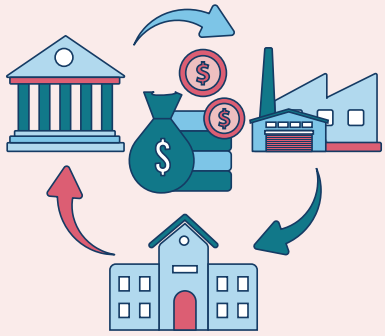
Feature Article

IMPACT OF ENTERPRISE SINGAPORE'S FINANCING SCHEMES DURING THE COVID-19 PANDEMIC

INTRODUCTION

To ensure that viable firms, especially small- and medium-sized enterprises (SMEs), retain access to credit during the pandemic, the government expanded risk-sharing arrangements with Participating Financial Institutions to provide working capital loans to eligible firms through the introduction of a Temporary Bridging Loan (TBL) Programme and enhancements of the existing Enterprise Financing Scheme – SME Working Capital Loan (i.e., Enhanced EFS-WCL or EWCL). The TBL was first introduced in Budget 2020 (Unity Budget) for firms in the tourism sector, and later expanded to cover all enterprises under the Resilience Budget in March 2020. Both SMEs and large firms that meet the eligibility criteria can apply for loans under the TBL. Meanwhile, the existing EFS-WCL scheme was enhanced in the Unity Budget before being further enhanced in the Resilience and Solidarity Budgets in March and April 2020 respectively. Unlike the TBL, the EWCL was restricted to SMEs.

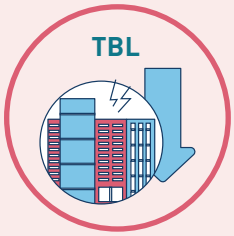


To ensure viable firms, especially SMEs, retain access to credit during the pandemic

FINDINGS

As the main financing scheme to support firms during the crisis, the TBL had lowered the probability of firm financial distress (i.e., the probability of a firm missing its payment obligations) and helped to support firms' employment. The alleviation of financial distress was seen across firms of all sizes, while the impact on total employment was driven by smaller firms. Meanwhile, the EWCL was found to have no statistically significant impact on the probability of firm financial distress nor firms' total employment at the overall level, although it led to higher total employment for construction firms.

Positive impact on firms' total employment

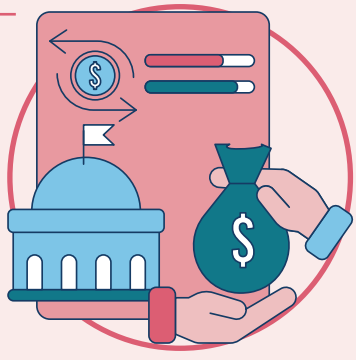


Reduced the probability of firm financial distress

Positive impact on employment for construction firms

POLICY TAKEAWAY

Using high-frequency firm-level data, this study finds that the TBL, which is the key financing support scheme during the COVID-19 crisis, had lowered the probability of firm financial distress and helped to support firms' employment. The findings demonstrate the importance of providing immediate financing support to firms for their cashflow needs, especially at the onset of the COVID-19 pandemic.



EXECUTIVE SUMMARY

- Using a set of monthly firm-level data compiled by various government agencies (e.g., Enterprise Singapore (ESG), Ministry of Manpower (MOM), Central Provident Fund Board (CPFB)), this study examines the impact of ESG's financing schemes (viz., Temporary Bridging Loan (TBL) Programme and Enhanced Enterprise Financing Scheme – SME Working Capital Loan (EWCL)) during the COVID-19 pandemic.

- In the past, such impact analyses would have been carried out with a significant time lag due to the use of annual data on firm-level outcomes that are compiled with a lag. Given the unprecedented scale of the economic fallout from the COVID-19 pandemic and the fast-evolving health situation, a more timely analysis of the impact of the government schemes put in place to help firms and workers tide over the crisis was needed in order to calibrate the government's responses to the pandemic more effectively. As such, this study tapped on high-frequency (monthly) firm-level outcome indicators to provide an assessment of the impact of the financing schemes during the crisis.

- In line with the policy intent, the results of the study showed that a TBL loan of average quantum reduced the probability of firm financial distress (i.e., probability of a firm missing its payment obligations) by 0.05 percentage-point (pp) and had a positive impact on firms' total employment of 0.26 per cent on average. The alleviation of financial distress was seen across firms of all sizes, while the impact on total employment was driven by smaller firms (i.e., firms with no more than 50 employees).

- Given the high-frequency nature of the data used for the study, the estimated impact of the financing schemes should be seen as the short-term impact. Its purpose is to provide a prompt sensing of the schemes' effectiveness during the pandemic. A more comprehensive study to analyse the longer-term benefits and costs of the schemes should be conducted once annual data on firm-level outcomes (e.g., financial information, value-added) are available.

The views expressed in this paper are solely those of the author and do not necessarily reflect those of the Ministry of Trade and Industry (MTI) or other government agencies.[1]

INTRODUCTION

Since the onset of the COVID-19 pandemic, governments around the world have implemented a wide range of measures to mitigate the economic impact of the pandemic. In particular, as demand and revenue plummeted during the pandemic, viable firms with difficulties financing their operations required additional cashflow support. This led many countries to introduce new or enhance existing loan guarantee schemes to sustain bank lending and avoid a credit supply crunch during the pandemic. Under such schemes, governments commit to absorb a portion of the bank's losses on the loans made to firms (i.e., government risk share). This then incentivises banks to provide loans to meet the cashflow needs of firms during the crisis.

In Singapore, to ensure that viable firms, especially small- and medium-sized enterprises (SMEs), retain access to credit during the pandemic, the government expanded risk-sharing arrangements with Participating Financial Institutions to provide working capital loans to eligible firms through the introduction of a Temporary Bridging Loan (TBL) Programme and enhancements of the existing Enterprise Financing Scheme – SME Working Capital Loan (i.e., Enhanced EFS-WCL or EWCL).[2] The TBL was first introduced in Budget 2020 (Unity Budget) for firms in the tourism sector, and later expanded to cover all enterprises under the Resilience Budget in March 2020. Both SMEs and large firms that meet the eligibility criteria can apply for loans under the TBL. Meanwhile, the existing EFS-WCL scheme was enhanced in the Unity Budget before being further enhanced in the Resilience and Solidarity Budgets in March and April 2020 respectively. Unlike the TBL, the EWCL was restricted to SMEs (Exhibit 1).

1 *I would like to thank ESG for their inputs to this study and acknowledge the contributions of Mr Tan Di Song and Mr Kuhan Harichandra to the study. I would also like to thank Ms Yong Yik Wei for her useful suggestions and comments. All errors belong to me.*

2 *Two other financing schemes by ESG, the Loan Insurance Scheme and Trade Loan Scheme, were also enhanced in the Resilience Budget. This study does not include these two schemes as they are not targeted specifically at the working capital needs of firms.*

Exhibit 1: Details and Timeline of the Financing Schemes

	Prior to the Unity Budget	Unity Budget (February 2020)	Resilience Budget (March 2020)	Solidarity Budget (April 2020)	Taper from April 2021 onwards
Temporary Bridging Loan Programme	-	80% government risk share; maximum loan quantum of $1 million; only for firms in the tourism sector.	80% government risk share; maximum loan quantum of $5 million.	90% government risk share; maximum loan quantum of $5 million.	70% government risk share; maximum loan quantum of $3 million.
Enhanced Enterprise Financing Scheme – SME Working Capital Loan	50% government risk share; maximum loan quantum of $300,000.	EWCL: 80% government risk share; maximum loan quantum of $600,000.	EWCL: 80% government risk share; maximum loan quantum of $1 million.	EWCL: 90% government risk share; maximum loan quantum of $1 million.	50% government risk share; maximum loan quantum of $300,000.

This study examines the impact of the TBL and EWCL on high-frequency (monthly) firm-level outcomes related to financial distress and employment. Focusing on these outcomes will help to shed light on whether the financing schemes helped to keep firms afloat and save jobs during the COVID-19-induced recession. In the past, such impact evaluations would have been carried out with a significant time lag due to the use of comprehensive annual data on firm-level outcomes that are compiled with a lag. Given the unprecedented scale of the economic fallout from the COVID-19 pandemic and the fast-evolving health situation, a more timely analysis of the impact of the government schemes put in place to help firms and workers tide over the crisis was needed in order to calibrate the government's responses to the pandemic more effectively.[3]

LITERATURE REVIEW

Empirical studies in other countries on the impact of financing schemes on firm-level outcomes generally found positive results. For instance, Gereben et al. (2019) found that the European Investment Bank's lending schemes had a positive impact on SMEs' employment and revenue, while Brault and Signore (2019) found that the EU's guaranteed loans lowered firms' probability of default. Specific to the COVID-19 pandemic, Gourinchas et al. (2021) found that government policy support (including tax waivers, cash grants and pandemic loans) was successful in reducing the failure rate of SMEs relative to a normal (non-COVID) year, from around 9.0 per cent to 4.3 per cent. Similarly, Chetty et al. (2020) found that loans under the Paycheck Protection Program in the United States increased employment in small businesses by about 2.0 per cent.

In Singapore's context, Ng et al. (2018) found that ESG's loan schemes (specifically the Equipment, Micro and Enhanced Micro loans) had a positive impact on firms' revenue, possibly through helping firms with their working capital needs and thus allowing firms to increase sales.

3 *An example of a high-frequency impact assessment in the economic literature is the study by Chetty et al. (2020), which used high-frequency firm outcomes compiled from credit card processors, payroll firms, job posting aggregators and financial services firms to evaluate some of the US government's policies in response to COVID-19 in real time.*

DATA AND SUMMARY STATISTICS

To conduct the impact analysis, a set of high-frequency monthly firm-level data was assembled. The key firm-level outcome indicators in the dataset include (i) a binary indicator of firm financial distress constructed using data from various sources (see Exhibit 2), which indicates whether a firm was prompt in meeting its payment obligations in a particular month; and (ii) firms' total employment levels based on CPFB and MOM data. The firm financial distress indicator was used as a proxy for default risk in the study given that high-frequency data on more conventional cashflow indicators[4] at the firm level are not available. The high-frequency firm-level outcome indicators were matched to administrative data on the disbursements made to firms under the financing schemes[5] and other government support schemes, including the Jobs Support Scheme (JSS), Foreign Worker Levy Rebate (FWLR) and Wage Credit Scheme (WCS)[6]. The study covers the period from September 2019 to August 2021.

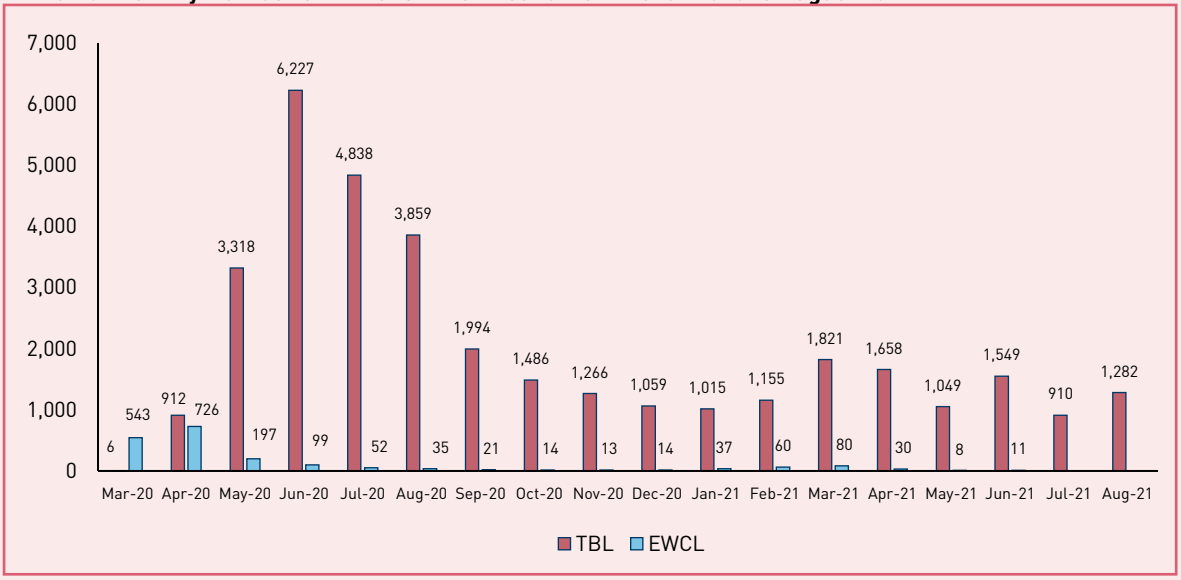
Exhibit 2: Data Used in the Construction of the Firm Financial Distress Indicator

Firm-level outcome	Source	Frequency
CPF late payments	CPFB	Monthly
Rental arrears	JTC	
Electricity payment arrears	EMA	
Foreign worker levy default	MOM	

Note: A firm was identified to be in financial distress, in a particular month, if the firm (1) was late in making employer's CPF contribution for the month; or (2) had defaulted on its payment of foreign worker levy; or (3) had an increase in outstanding JTC rental arrears or electricity payment arrears owed to SP Group as compared to the previous month.

Over the period of March 2020 to August 2021, more than 24,000 and 1,800 firms took up the TBL and EWCL respectively. In particular, the number of loan recipients surged from March 2020 to June 2020 before moderating from July 2020 onwards (Exhibit 3). This was due to the implementation of the Circuit Breaker from April 2020 to June 2020[7], which disrupted economic activity and strained the cashflows of firms. Most of the TBL and EWCL recipients were smaller firms with no more than 50 employees (Exhibit 4). Compared to non-recipients, TBL and EWCL recipients had higher average employment levels, and a smaller proportion of them were in distress based on the firm financial distress indicator constructed for the study (Exhibit 5).

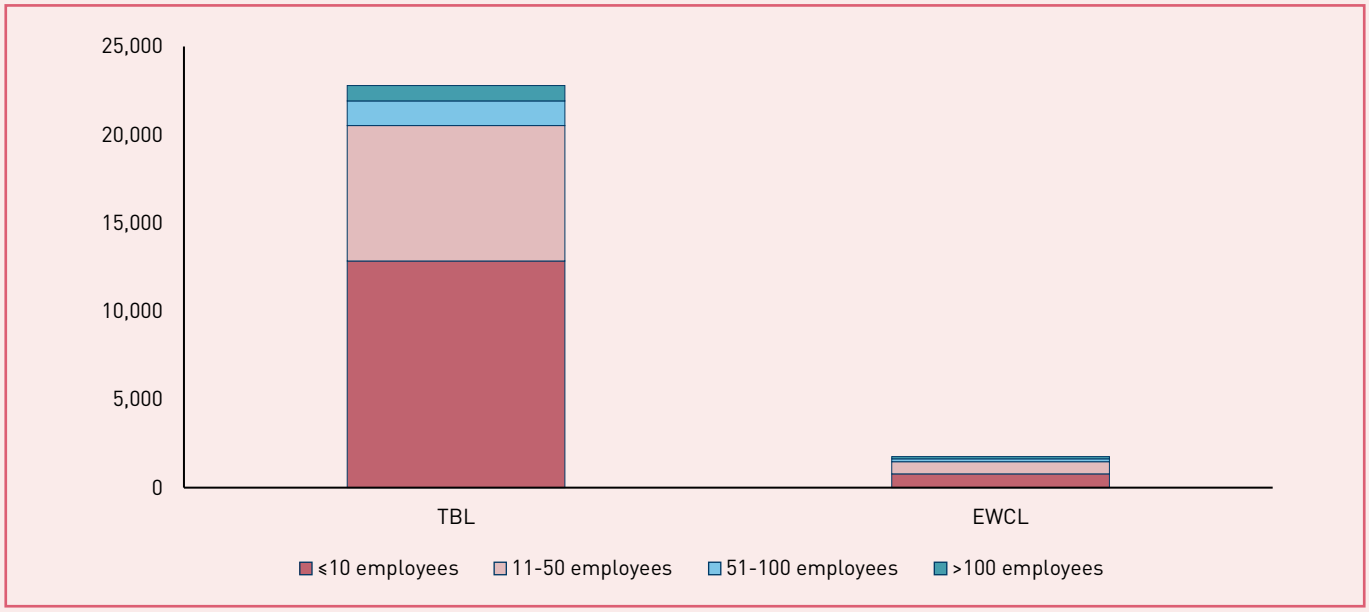
Exhibit 3: Monthly Number of TBL and EWCL Loans from March 2020 to August 2021



Notes: (1) The numbers do not reflect unique loan recipients as some of the recipients took loans under multiple schemes and multiple loans in different months; (2) Data is as of September 2021.
Source: ESG

4 *Typical indicators of firms' cash buffers include Cash Ratios and Interest Coverage Ratios. However, information on such indicators is not available in the high-frequency dataset assembled.*
5 *The data on financing schemes include loans provided under ESG's trade financing schemes (i.e., Enhanced Financing Scheme – Trade Loan (ETL) and the Enhanced Loan Insurance Scheme (ELIS)). Loans under these schemes were used as control variables in the regression analysis on the impact of the TBL and EWCL.*
6 *While the impact of the JSS, FWLR and WCS were not examined in this study, payouts from these schemes were used as control variables in the regression analysis. Further details can be found in the methodology section.*
7 *The Circuit Breaker lasted from 7 April 2020 to 1 June 2020. Measures included the closure of most physical workplace premises (thereby affecting businesses which could not operate remotely from home) in order to control the local transmission of COVID-19.*

Exhibit 4: Total Number of TBL and EWCL Loans from March 2020 to August 2021 by Employment Size



Notes: (1) The numbers do not reflect unique loan recipients as some of the recipients took loans under multiple schemes and multiple loans in different months; (2) Firms with missing employment data are dropped from the analysis; (3) Total employment is based on firm's employment size as at December 2019.
Source: Authors' calculation, based on data from ESG and CPFB

Exhibit 5: Key Firm Characteristics of TBL and EWCL Recipients and Non-Recipients

Key Firm Characteristics	TBL	EWCL	Non-Loan Recipients
Proportion of Firms in Distress	20%	23%	48%
Average Total Employment	23	34	19

Note: (1) The proportion of firms in distress is based on the values in April 2020, which is the earliest date where all four variables used to construct the indicator (in Exhibit 2) are available; (2) Average employment is based on firm's employment size as at December 2019.
Source: Authors' calculation, based on data from ESG and other sources indicated at the start of this section

METHODOLOGY

An important consideration when evaluating the causal impact of the TBL and EWCL on firm-level outcomes is that the types of firms that were eligible for and took up the financing schemes might be different from those that were ineligible for or did not tap on the schemes (i.e., selection bias). For instance, commercial banks were more likely to approve loans to firms with viable businesses or those with stronger balance sheets.

To mitigate such selection biases, the study adopted a two-way fixed effects regression model[8] to account for differences across firms that could have affected their take-up of the financing schemes. In particular, the model accounted for time trends that affected all firms (e.g., macroeconomic conditions) and unique firm characteristics (including those not observed in the dataset) that did not change during the period of study (e.g., firm managerial culture). To isolate the incremental impact of the financing schemes, disbursements from other major government support schemes, such as the JSS payments received by firms, were included as controls in the regression model. By mitigating selection biases[9], the methodology employed provided more confidence that differences in firms' outcomes could be attributed to the take-up of the financing schemes. The regression specification used is as follows:

8 *Two-way fixed effects regression models are widely used by academics and government researchers to evaluate the impact of various policies. See Toh et al. (2021) and Banerjee & Iyer (2005) for examples of studies that used two-way fixed effects regression models.*
9 *Nonetheless, selection bias could still exist if there were time-varying characteristics that affected firms' probability of obtaining loans but were not captured in the high-frequency dataset. For example, firms with similar financial health prior to the pandemic could have seen their financial health react differently to the pandemic, but the study was not able to account for this due to the lack of monthly financial data in the dataset.*

$$log\ Y_{it} = \beta' log\ cumloan_{it} + \varphi' X_{it} + \gamma_i + \theta_t + \varepsilon_{it} \quad (1)$$

Where:

- Y_{it} represents firm-level outcomes (i.e., firm financial distress, total employment) for firm i in month t. For firm financial distress, a binary outcome indicator was used[10];
- $cumloan_{it}$ is a vector of cumulative loan amounts that firm i received in month t, with each element in the vector corresponding to each of the two loan schemes (i.e., TBL, EWCL);
- X_{it} represents a set of controls that include disbursements under other major government schemes (i.e., JSS, FWLR, WCS, ETL and ELIS) received by firm i in month t;
- γ_i *and* θ_t represent the firm-level (cross-sectional) and month (time) fixed effects, respectively;
- β measures the average impact of an increase in cumulative loan amount on firm-level outcomes;
- ϵ_{it} is the error term.

Separate regressions using equation (1) were run for manufacturing, services and construction firms to obtain sector-specific impact estimates. To investigate if the impact of the financing schemes varied across firms of different sizes, the following regression specification, where the cumulative loan variable was interacted with a categorical variable denoting the employment size category of the firm, was run:

$$log\ Y_{it} = \beta' log\ cumloan_{it} + \psi'\ firmsize_i \times log\ cumloan_{it} + \theta' X_{it} + \gamma_i + \theta_t + \varepsilon_{it} \quad (2)$$

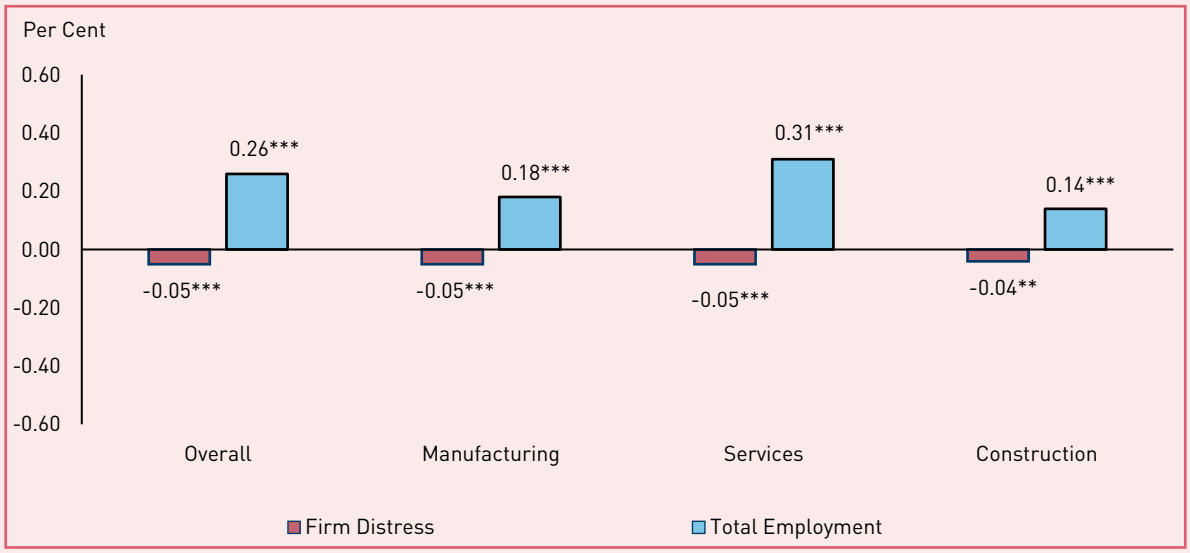
Where:

- $firmsize_i$ represents the employment size category of firm i proxied by its total employment size in December 2019 (categories: ⩽10, 11-50, 51-100, >100[11]);
- All other variables are as defined in equation (1).

RESULTS

The regression results showed that the TBL helped to alleviate financial distress among firms across all sectors and led to improvements in firms' employment outcomes (Exhibit 6). In line with the policy intent, the financing assistance provided by a TBL loan of average quantum led to a 0.05 percentage-point (pp) fall in the probability of firm financial distress (i.e., the probability of a firm missing its payment obligations) at the overall level. The results also showed that firms' total employment rose by 0.26 per cent after receiving a TBL loan of average quantum, with services firms seeing the strongest employment impact compared to firms in other sectors.

Exhibit 6: Impact of a TBL Loan of Average Quantum on Firm-Level Outcome by Sector (%)

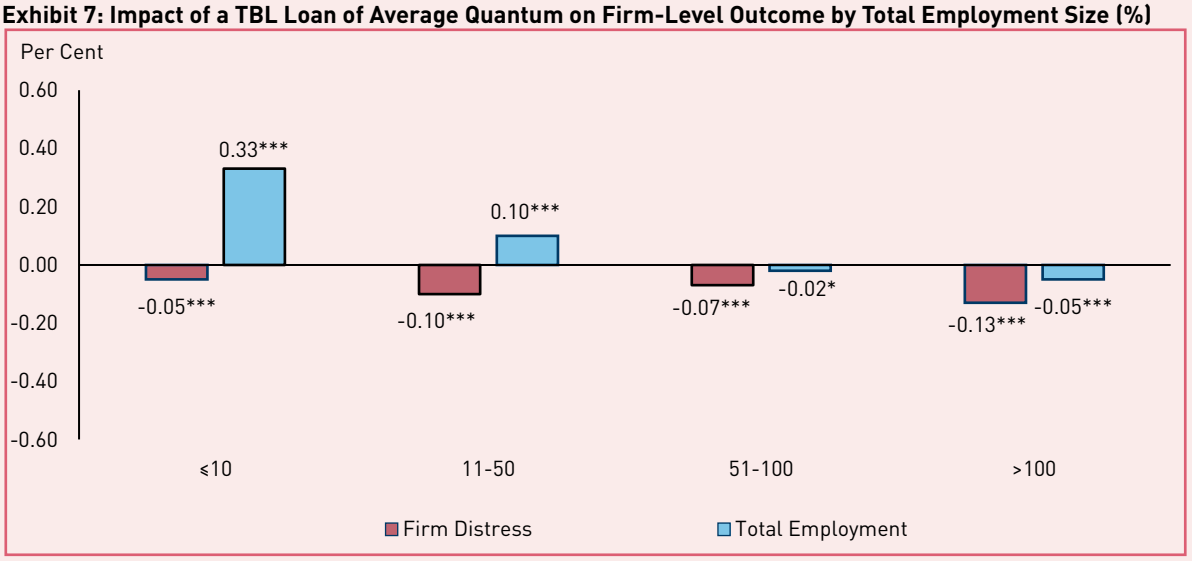


*Statistical significance: *** p<0.01, ** p<0.05, *p<0.10*
Notes: (1) Impact on firm distress refers to a percentage-point (pp) impact; (2) Bars with bolded borders indicate estimates that are statistically significant at the 10% level.

10 *For firm financial distress, a fixed effects logit model was used to estimate the impact of the schemes on the probability of a firm being in distress. Bias correction was implemented, following the results of Fernandez-Val (2009).*
11 *Firms with employment size of >100 were not broken down into finer categories due to the relatively small number of loan recipients in the large employment size categories.*

By firm size, a fall in the probability of firm financial distress was seen across firms of all employment sizes. Smaller firms also saw a positive impact on total employment, with the smallest firms (i.e., those with no more than 10 workers) experiencing the largest effect (+0.33 per cent). On the other hand, larger firms (i.e., those with more than 50 workers) saw a slight negative impact on total employment.[12] These results suggest that the TBL was effective primarily in helping smaller firms to hire and retain workers (Exhibit 7).

Exhibit 7: Impact of a TBL Loan of Average Quantum on Firm-Level Outcome by Total Employment Size (%)



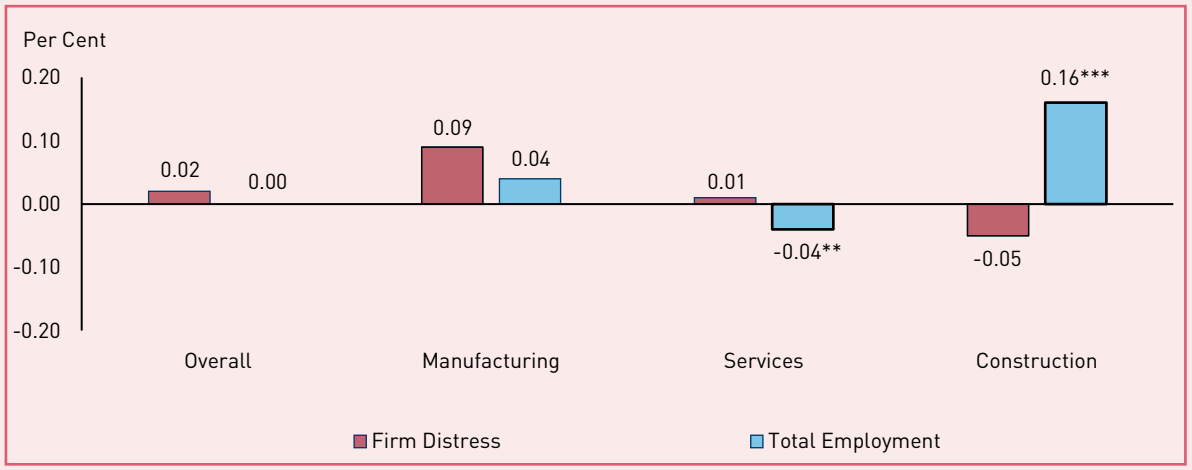
*Statistical significance: *** p<0.01, ** p<0.05, *p<0.10*
Notes: (1) Impact on firm distress refers to a percentage-point (pp) impact; (2) Bars with bolded borders indicate estimates that are statistically significant at the 10 per cent level.

Meanwhile, the EWCL was found to have no statistically significant impact on the probability of firm financial distress nor firms' total employment (Exhibit 8). The lack of a significant impact from the receipt of an EWCL loan is likely because most EWCL recipients also took TBL loans[13]. As the TBL had a maximum loan quantum of $5 million compared to the maximum loan quantum of $1 million under the EWCL, the EWCL loan was found to have limited incremental impact after controlling for the receipt of a TBL loan.

At the sectoral level, construction firms saw a 0.16 per cent increase in total employment from the receipt of an additional average EWCL loan. This suggests that construction firms, which had been adversely affected by safe management measures and border restrictions on the entry of migrant workers, were facing severe cashflow constraints and hence required the EWCL on top of the TBL to support worker retention. Meanwhile, services firms experienced a negative impact on total employment from the receipt of an average EWCL loan. This could be due to the use of the loan by firms in consumer-facing sectors (e.g., retail trade, F&B services)[14] – which had seen a large fall in domestic and tourist demand as a result of COVID-19 restrictions – for restructuring purposes so that they are leaner on manpower.

12 A closer examination of the data showed that local employment in larger firms rose during the period of analysis, suggesting that the slight negative impact on total employment for larger firms could be due to border restrictions during the pandemic which limited their ability to hire foreigners.
13 73 per cent of EWCL recipients also received the TBL. Amongst construction firms that received the EWCL, 83 per cent received the TBL.
14 23 per cent of EWCL recipients were from the retail trade and F&B services sectors.

Exhibit 8: Impact of an EWCL Loan of Average Quantum on Firm-level Outcome by Sector (%)[15]



*Statistical significance: *** p<0.01, ** p<0.05, *p<0.10*
Notes: (1) Impact on firm distress refers to a percentage-point (pp) impact; (2) Bars with bolded borders indicate estimates that are statistically significant at the 10 per cent level.

CONCLUSION

This study finds that the TBL, which is the key financing support scheme rolled out during the COVID-19 crisis, had lowered the probability of firm financial distress and helped to support firms' employment. The findings demonstrate the importance of providing immediate financing support to firms for their cashflow needs, especially at the onset of the COVID-19 pandemic.

Given the high-frequency nature of the data used for the study, the estimated impact of the financing schemes should be seen as the short-term impact. Its purpose is to provide a prompt sensing of the schemes' effectiveness during the pandemic. Once comprehensive annual data on firm-level outcomes (e.g., financial information, value-added) are available, a further study should be conducted to analyse the longer-term benefits and costs of these schemes. This is especially since the average loan tenure is around five years and the final fiscal outlay from the government for the schemes (i.e., loan loss) would depend on the performance of the loans in the years ahead.

It is also useful to note that a key objective of government financing facilities during the COVID-19 crisis was to avoid a credit supply crunch and ensure that banks continued to lend amidst elevated macroeconomic uncertainty. This study focuses on micro firm-level outcomes and does not examine how government financing schemes affected overall liquidity conditions, which is key to avoiding macro-financial amplification effects during the crisis (e.g., waves of defaults by interconnected firms leading to banks tightening lending, which could lead to further waves of defaults).

Contributed by:

Mr Koh Wen Jie, Economist
Economics Division
Ministry of Trade and Industry

15 The study did not examine the impact of the EWCL by firm size due to the small sample across most firm sizes, which would affect the precision of the estimates.

REFERENCES

Toh, B., Koh, W. J. (2021). Impact of Enterprise Singapore's Grants on Firms' Revenue and Exports. In Economic Survey of Singapore Third Quarter 2021 (pp. 44-50). Singapore: Ministry of Trade and Industry.

Gourinchas, P., Kalemli-Özcan, Şebnem., Penciakova, Veronika., Sander, Nick. (2021). Fiscal Policy in the Age of Covid: Does it 'Get in All of the Cracks?'. NBER Working Paper, No. w29293

Chetty, R., Friedman, J. N., Hendren, N., Stepner, M., Opportunity Insights Team (2020). The Economic Impacts of COVID-19: Evidence from a New Public Database Built Using Private Sector Data. Opportunity Insights Economic Tracker: Supporting the Recovery from COVID-19

Gereben, Aron., Rop, Anton., Petricek, Matic., Winkler, Adalbert. (2019). The impact of international financial institutions on small and medium enterprises: The case of EIB lending in Central and Eastern Europe. EIB Working Papers, No. 2019/09, ISBN 978-92-861-4374-8, European Investment Bank (EIB), Luxembourg

Brault, Julien., Signore, Simone. (2019). The real effects of EU loan guarantee schemes for SMEs: A pan-European assessment. EIF Working Paper, No. 2019/56, European Investment Fund (EIF), Luxembourg

Ng, J., Pang, J., Feng, A., (2019). An Evaluation of the Impact of Enterprise Singapore's Loan Schemes. In Economic Survey of Singapore First Quarter 2018 (pp. 44-51). Singapore: Ministry of Trade and Industry.

Fernandez-Val, I. (2009). Fixed effects estimation of structural parameters and marginal effects in panel probit models. Journal of Econometrics, 150(1), 71-85

Banerjee, A., Iyer, L. (2005). History, Institutions, and Economic Performance: The Legacy of Colonial Land Tenure Systems in India. The American Economic Review, Vol. 95, No. 4 (Sep., 2005), pp. 1190-1213