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Do Subsidized Export Credits Affect Firms' Behavior in the FX Market? Micro Evidence from Türkiye*

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Abstract

Exports have direct and indirect contributions to growth and welfare; therefore, countries have been implementing various policies to boost exports. Among these policies, export credit remains an important policy instrument. Through its export-led growth strategy, Türkiye intends to increase its exports by subsidizing exporters via a rediscount credit scheme, a form of subsidized export credit, that is mostly financed by the Central Bank of the Republic of Türkiye (CBRT). In this paper, we aim to answer whether benefiting from such cost-effective financial support causes unintended consequences. We focus on the foreign exchange (FX) purchases of treated firms and estimate whether they purchase more FX than their non-treated pairs during the treatment period. Using firm-level data, we employ a propensity score matching (PSM) difference-in-differences (DD) estimator. Focusing only on firms that used rediscount credit for the first time after June 2020, we find evidence of positive and significant impact of using rediscount credits on the treated firms' net FX purchases. However, this impact significantly diminishes after the CBRT regulations on the conditions for allocation and repayment of rediscount credits came into effect. We also find that being net importer increases the sensitivity of net FX purchase to using rediscount credit. We show that the effect of using rediscount credits on net FX purchase is higher in SMEs than in large firms. Our results suggest that directing rediscount credits from net importers to net exporters and preventing unintended uses through efficient regulations may increase the positive contribution of rediscount credit programs to financial stability.

JEL Codes: F13, F31, O24, E58
Keywords: Rediscount credits, propensity score matching, difference-in-differences, Türkiye

İhracat Kredileri Firmaların Döviz Alım Davranışlarını Etkiliyor mu? Türkiye Üzerine Bir Mikro Veri Analizi

Özet

İhracatın büyüme ve refah üzerine hem doğrudan hem de dolaylı katkısı nedeniyle birçok ülke ihracatı destekleyici politikalar uygulamaktadır. İhracat kredileri bu politikalar içerisinde önemli bir yer tutmaktadır. Türkiye, ihracata dayalı büyüme stratejisi çerçevesinde, büyük bölümü Türkiye Cumhuriyet Merkez Bankası (TCMB) tarafından finanse edilen reeskont kredileri ile ihracatçıları sübvanse ederek ülke ihracatını artırmayı hedeflemektedir. Güncel ve geniş bir mikro veri seti ile firma eşleştirme ve farkların farkı yöntemlerini kullanarak yaptığımız bu çalışmada, ihracat ve döviz kazandırıcı hizmetler reeskont kredisini ilk kez kullanan firmaların döviz alımlarına odaklanıp bu firmaların reeskont kredilerini amacına uygun kullanıp kullanmadıklarını ve benzer fakat reeskont kredisi kullanmayan diğer firmalara göre daha fazla döviz alıp almadıklarını incelemeyi amaçladık. Çalışmanın bulguları, reeskont kredisi kullanma ile net döviz alıcısı olma arasında pozitif ve anlamlı bir ilişki olduğunu; fakat bu ilişkinin TCMB'nin reeskont kredisi kullanım ve geri ödeme koşullarına ilişkin son dönemdeki düzenlemeleri sonrasında önemli ölçüde zayıfladığını göstermektedir. Ayrıca çalışmamız, net ithalatçı firmalar için reeskont kredisi kullanımı-nette döviz alıcısı olma ilişkisinin daha güçlü olduğunu ve reeskont kredisi kullanımının net döviz alımı üzerindeki etkisinin KOBİ'lerde büyük firmalara göre daha yüksek olduğunu göstermektedir. Çalışmanın sonuçları, reeskont kredilerinin net ithalatçılardan net ihracatçı firmalara yönlendirilmesinin ve etkin düzenlemelerle amaç dışı kullanımın önlenmesinin reeskont kredisi programlarının finansal istikrara katkısını artırabileceğini göstermektedir.

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Non-Technical Summary

We study the effects of using rediscount credits on firms' behavior in the FX market by linking rediscount credit registry and various comprehensive administrative datasets on FX transactions, financial statements, income statements, customs data, and the credit registry. We focus particularly on the FX purchases of firms using rediscount credits and estimate whether they purchase more FX than their non-treated pairs during the treatment period. Since firms using rediscount credits are expected to use this subsidized financial support to mitigate export-related credit constraints rather than purchasing more FX for the sake of hedging or foreign exchange gain, our results have important policy suggestions for improving the effectiveness of the rediscount credit scheme.

Using firm-level data and employing a propensity score matching DD estimator, we find evidence of a positive and significant effect of using rediscount credits on the treated firms' net FX purchases: on average, firms using rediscount credits have a 2.3 percent higher probability of becoming a net FX purchaser than the non-users. However, this impact significantly diminishes after the CBRT's regulation on the conditions for allocation and repayment of rediscount credits came into effect. The results show that this regulation partly achieved its goals of improving the effectiveness of the rediscount credits by restricting the access of net importer firms and allowing credits to be used only for payments of specified expenditures in TL. We also find that the effect of using rediscount credits on net FX purchases is higher in SMEs than in large firms, and being a net importer increases the sensitivity of net FX purchases to using rediscount credits.

Since our design has variation in the timing of treatment, we also identify the sources of variation and where differences come from by implementing a Bacon decomposition of a DD estimator with variation in treatment timing. The results show that 65.8 percent of variation comes from the treated/untreated component (where a group which never receives the treatment serves as the control group) while 31.8 percent of variation comes from timing.

The import dependency of exports might trigger the unintended use of rediscount credits since most exporters heavily depend on imported raw and intermediate goods, which requires payment in FX – often in advance. For instance, the exporters that use the rediscount credit facility sacrifice some of their future FX income for the TL they get when they use the rediscount credits. Therefore, one would expect exporters that benefit from rediscount credits to turn to the spot FX market to compensate for their abandoned future FX income. Furthermore, rediscount credits have lower interest rates and less collateral requirements compared to the loan terms offered in market conditions in the domestic banking sector. The depreciation of the domestic currency may have tempted firms using rediscount credits to purchase surplus FX with the subsidized credits. Thanks to the comprehensive data we have, we are able to answer such a relevant but unanswered question.

Our results suggest that directing rediscount credits away from net importers toward net exporters and preventing the unintended use through efficient regulation may increase the positive contribution of rediscount credit programs to financial stability.

1. Introduction

A large literature has shown that exports contribute to nations' balance of trade, job creation and standard of living, and boost socioeconomic prosperity (Freeman and Styles, 2014; Mansion and Bausch, 2020). In other words, exports have direct and indirect contributions to growth and welfare. Therefore, countries have been implementing policies at the macro and micro level to boost their exports. Among many supports and subsidies, export credit remains an important policy instrument especially in today's globalizing world economy.[1] Most countries use export credits to mitigate export-related credit constraints. Türkiye, a country that has been adopting an export-led growth model since the 1980s, is among those countries and has implemented several policies and measures[2] including rediscount credit, a form of subsidized export credit, to support this growth strategy. Türkiye intends to expand its exports by subsidizing exporter firms (providing credits at low interest rates and with minimal collateral) via a massive rediscount credit scheme that is financed by the Central Bank of the Republic of Türkiye (CBRT).[3]

The CBRT has two rediscount credit schemes: Foreign Exchange (FX) and Turkish Lira (TL) rediscount credits. In both schemes, credits are extended to the exporting firms through intermediary banks – mostly via Turk Eximbank, but also via private banks and state banks. FX rediscount credits are provided in the TL equivalent of the denominated foreign currency (e.g., USD, EUR, GBP, JPY and CNY) amount specified in the bill. The TL equivalent of the credit is calculated by the effective exchange rate of the denominated currency on the same day that the credit is extended. The CBRT provides rediscount credits to increase foreign currency reserves (especially with the FX-denominated rediscount credits) and promote exports, and hence to improve the current account balance, which is vital both for financial and price stability. Over the years, the CBRT has made several changes in the conditions for allocation and repayment of rediscount credits to achieve its goals. Moreover, it increased the total rediscount credit limit several times (see Section 2 for a brief review of the institutional background). With these changes and improvements, the number of benefiting firms and the total amount of credit increased significantly.

Figure 1 shows the evolution of number of firms using the credit and newly issued rediscount credits that are financed by the CBRT over the 2008-2022 period. It should be noted that the number of benefiting firms has been increasing at a higher rate than the amount of credit given, especially in the recent years. This is partly the result of recent changes in the allocation mechanism that directly or indirectly targets to increase the credit share of small and medium-sized enterprises (SMEs), and to

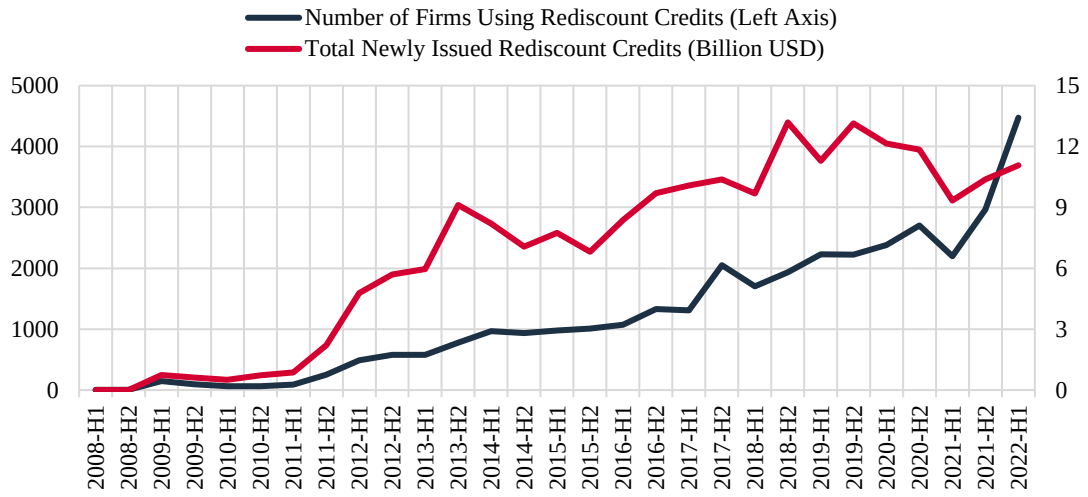
[1] Many governments pursue export-promotion policies to support economic growth and improve the welfare of their citizens. These policies include free-trade agreements, tax exemptions, cash support, customs duty exemption, corporate tax exemptions, and credit support, etc.

[2] These measures include implementing sectoral and country-based diversification strategy in export composition, increasing participation at international fairs, general and sectoral trade delegations in target markets, improving logistic facilities, developing new export finance tools, etc. (see Ministry of Trade, 2022).

[3] The CBRT has been utilizing rediscount credits since the 1980s. Initially, it was used for the purpose of development financing but it has been used as a monetary policy instrument since the 1990s. However, the total limit of the rediscount credit scheme was very low until 2013. Since then it has been raised several times and reached 30 billion USD (see Section 2 for the details).

reduce the concentration in the rediscount credits.[4] However, firms that use rediscount credits are still, on average, larger than those that do not (see Section 2 and Section 3).

Figure 1. Evolution of Rediscount Credits in Türkiye



Source: CBRT.

Three important questions arise regarding the effectiveness of rediscount credits. First, do rediscount credits increase exports? Second, do rediscount credits cause unintended side effects? Third, are rediscount credit schemes successful in increasing the FX reserves of the CBRT? To answer the first question, Akgunduz et al. (2017) used firm-level data for the 2009-2014 period and showed that firms using rediscount credits increased their exports more than the non-supported pairs. As regard the third question, the CBRT's own reports show that FX rediscount credits contribute to the CBRT FX reserves, and because firms using TL rediscount credits have to sell FX export proceeds equaling the TL credit amount to the CBRT at maturity, they also contribute to the CBRT FX reserves.[5] However, empirical evidence on the second question is scant. In this paper, we aim to empirically answer the second question by focusing particularly on firms' net FX purchases and try to show whether the treated firms purchase more net FX than their non-supported pairs.

As an important structural problem of the Turkish economy, the import dependency of exports might trigger the unintended use of rediscount credits since most exporters heavily depend on imported raw and intermediate goods, which requires payment in FX – often in advance. For instance, exporters that use rediscount credit facility sacrifice some of their future FX income for the TL they get when they use the rediscount credits. Therefore, one would expect exporters that benefit from rediscount credits to turn to the spot FX market to compensate for their abandoned future FX income. Furthermore, these credits have lower interest rates and less collateral requirements compared to the loan terms offered in

[4] Recent data show that the CBRT has been successful in this regard (see Section 2 for the details).
[5] According to CBRT, the total contribution of rediscount credits to FX reserves was about 163 billion USD between 2009 and 2021.
(https://www.tcmb.gov.tr/wps/wcm/connect/EN/TCMB+EN/Main+Menu/Statistics/Banking+Data/Rediscount+Credits+Contribution+to+FX+Reserves).

market conditions in the domestic banking sector. The depreciation of the domestic currency during the analysis period may have tempted firms using rediscount credits to purchase surplus FX with the subsidized credits. Thanks to the comprehensive data we have, we are able to answer such a relevant but unanswered question. Since firms using rediscount credits are expected to use this subsidized-rate financial support to mitigate export-related credit constraints rather than purchasing more FX for the sake of hedging or foreign exchange gain, our results have important policy suggestions for improving the effectiveness of rediscount credit scheme.

Using firm-credit level micro data, we employ a propensity score matching (PSM) difference-in-differences (DD) estimator to analyze whether firms using rediscount credits purchase more net FX than their matched non-treated pairs. We first merge rediscount credit data from the CBRT with various comprehensive administrative datasets on financial statements, income statements, customs reports, credit registry, and FX transactions. To deal with the possible self-selection problem, we construct a control group using PSM, and focus only on firms that used rediscount credit for the first time after June 2020, the month that our FX transactions dataset starts. We find evidence of positive and significant effect of using rediscount credits on the treated firms' net FX purchases: on average, firms that used rediscount credits have a 2.3 percent higher probability of becoming a net FX purchaser than the non-users. We also find that the effect of using rediscount credits on net FX purchases is higher in SMEs than in large firms.

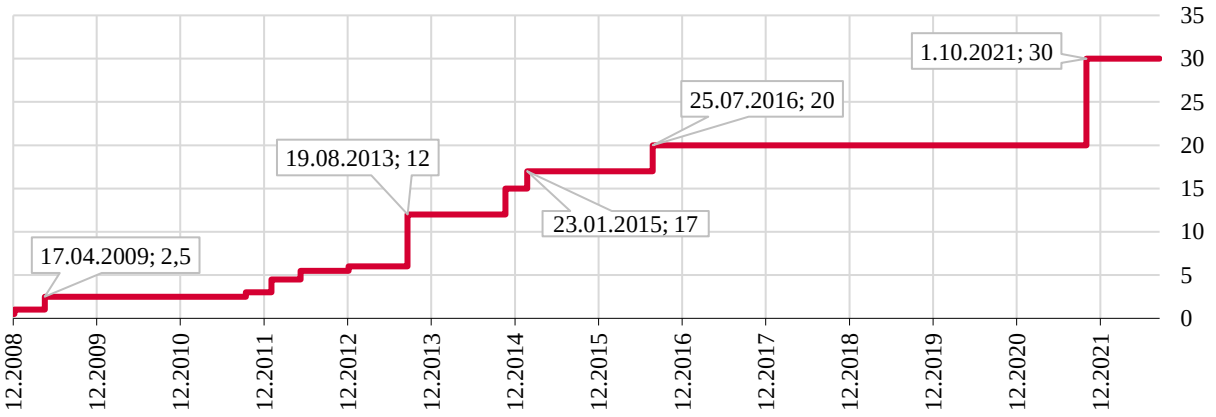
Our study is mostly related to the literature on public rediscount credits. The first generation of empirical studies employed industry- or country-level data (see for instance, Moser et al., 2008; Felbermayr and Yalcin, 2013; Auboin and Engemann, 2014). Among many others, using sectoral data for German firms, Felbermayr and Yalcin (2012) found that public export credit guarantees increase sectoral exports and the effect is larger in sectors that rely more on external finance. Some recent studies have employed firm-level data in estimating the effect of export credits on several firms' outcomes. For instance, Zia (2008), using firm and loan level data from Pakistan, found that the removal of subsidized loans caused a decline in the exports of privately-owned firms, whereas such a restriction did not affect the exports of large, publicly listed and group network firms – only causing their profits to decline. Using firm-level data for Germany, Felbermayr et al. (2012) found that state export credit guarantees increase firms' sales growth by about 4.5 percentage points. Moreover, employing a DD estimator and using data from Denmark, Jakel (2021) showed that there is a positive effect of export credits on total sales, exports and purchases of supported firms. As regards studies on Turkish firms, there is a limited number in this area. Polat and Yesilyaprak (2017) investigated the effect of export credit insurance provided by the Turk Eximbank on Turkish exports by using panel gravity regressions with country-level data. They found that there is a positive relation between export credit insurance and exports. Using firm-level data and employing a DD estimator, Akgunduz et al. (2017) found that firms using rediscount credits increased their exports by 65% compared to peer firms that did not use any rediscount credit in the same period.

The rest of the paper proceeds as follows: Section 2 provides a brief review of the institutional background. Section 3 presents the data and discusses our methodology. Section 4 presents results from the matching estimator. Section 5 provides further extensions. Section 6 presents the conclusions.

2. Institutional Background

The CBRT employed a rediscount credit scheme as a part of development financing until 1990 followed by a period when the scheme acted as a tool to meet the short-term liquidity demand of the banking sector. To alleviate the negative impact of the global crisis on the real sector, starting in December 2008, the CBRT increased the credit limits of the scheme, and reorganized and facilitated the conditions for using rediscount credits for exporters. The CBRT kept on gradually increasing the total limit for the scheme bringing the figure from 6 billion USD at the end of 2012 to 30 billion USD by the end of 2021 (Figure 2). Moreover, with the introduction of new conditions for allocation and repayment of rediscount credits for export and foreign exchange earning services, private banks started to issue rediscount credits as of October 2021.

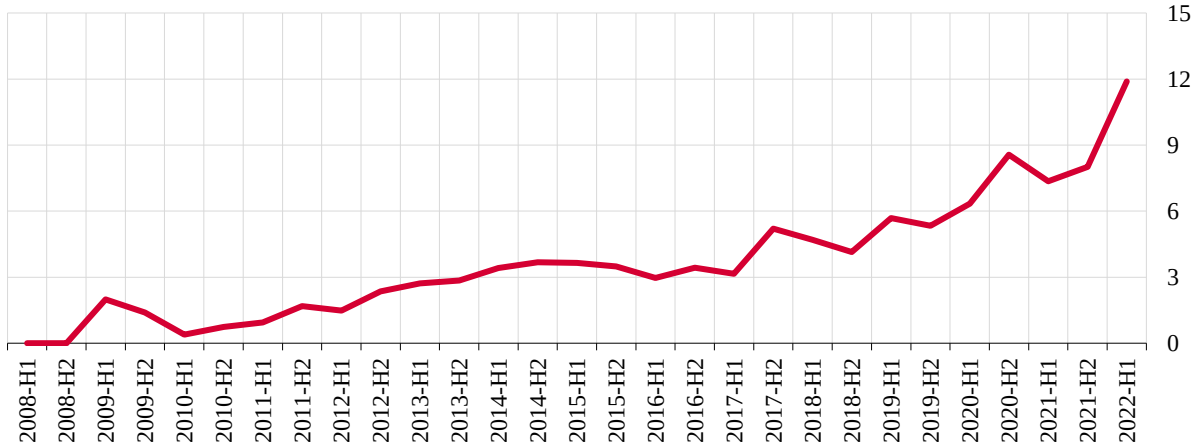
Figure 2. Total Rediscount Credit Limits for Exporters (Billion USD)



Source: CBRT.

The rediscount credit scheme has attracted a larger audience in recent years both in terms of the number of firms that use the scheme for the first time and in terms of the total number of benefiting firms. The diversity of firms reached a record level in the first six months of 2022 compared to previous periods (Figure 1). Moreover, an increasing proportion of the credits are granted to SMEs over time (Figure 3).

Figure 3. SME Share by Volume in Newly Issued Rediscount Credits (%)



Source: CBRT.

3. Data and Methodology

3.1. Data Sources

We combine seven administrative datasets for the analysis. The first dataset is the rediscount credit registry, which includes information about the origination date, credit amount, maturity, currency denomination, interest rate and issuers' commission rate for each credit issued by the related intermediaries on a daily basis. The second dataset is the spot FX market transactions data collected by the CBRT from banks operating in Türkiye. This dataset provides high-frequency information about all spot FX transactions made by non-financial firms. The third is collected by the Credit Registry of the Banks Association of Türkiye, and provides details of firm-bank credit relations as type, currency denomination and balance for all active loans on a monthly basis. The fourth and fifth datasets are collected by the Banking Regulation and Supervision Authority (BRSA) and include new opening and amortization of loans in detail on a daily basis, respectively. The sixth dataset includes balance sheets and income statements of non-financial firms. The raw administrative data of financial statements is collected by the Revenue Administration and processed by the Turkish Statistical Institute (TurkStat) and the CBRT on a yearly basis. This comprehensive dataset also includes firm-level employment data that originates from social security records. The final dataset is customs data of all Turkish firms, and includes information about the amount, destination/home country and product code at the CN 6-digit level for each transaction. This dataset is provided by the Ministry of Trade on a monthly basis. A comprehensive list of data used in this study is presented in Appendix (Table A1).

3.2. Methodology

3.2.1. Matching: Establishing a Control Group by Using Propensity Score Matching

The CBRT provides rediscount credits as a facility exclusive to exporter firms. These credits are mostly used by firms that have an export history and are larger in size. Moreover, using rediscount credit is not a random process, but rather subject to several layers of screening by the credit-issuing banks and the CBRT regulations. Furthermore, firms determine whether they apply for rediscount credits or not.

Therefore, the choice to use rediscount credit may be endogenous. Implementing the estimation without accounting for the above factors would produce biased results. To reduce a potential selection bias in estimating the causal effects of using rediscount credits on net FX purchases, we use a PSM approach to constitute a control group of firms that are comparable with the treatment firms.

Firstly, we filter out firms that did not export in 2019 and 2020 (in the first half) and have missing industry, establishment date or location information. Using the rediscount credit registry, we extract firms that used rediscount credits for the first time between July 2020 and May 2022 – the last data point of our analysis – to be in our treatment group and find the firms that never used rediscount credit before the end of May 2022 to be candidates for the control group. We exclude the period after May 2022 since the CBRT made comprehensive changes to the conditions of allocation of rediscount credits. These changes directly imposed restrictions on the FX purchases of firms using rediscount credits. Therefore, we limit the analysis period to July 2020-May 2022 in order to have consistent estimates. We define our treatment based on this period since spot FX market transactions data, which is our point of interest in the context of this research, began to be collected in March, 2020. We also exclude two more months from this dataset to account for data collection process to settle and to have more integrous data. The resulting data set consists of 43,407 firms, 2,495 of which belong to the treatment group. We present summary statistics for pre PSM dataset in Table 1.

Table 1. Summary Statistics (Treatment Firms and Other Firms) before Matching

	Treatment	Other Firms
Age	15.99	12.64
Sales in 2018 (in TL)	61,340,243	38,741,975
Sales in 2019 (in TL)	78,773,517	47,672,449
Operating Profits in 2018 (in TL)	4,066,883	2,158,902
Operating Profits in 2019 (in TL)	4,657,763	2,515,740
Domestic Sales in 2018 (in TL)	44,311,561	29,179,557
Domestic Sales in 2019 (in TL)	56,025,762	35,398,479
Export in 2019 (in USD)	3,027,828	1,586,274
Export in 2020 (as of 30.06.2020) (in USD)	1,474,592	690,276
FX Credit Balance in 2019	971,708	849,751
FX Credit Balance in 2020 (as of 30.06.2020)	886,674	799,206
Number of Firms	2,495	40,912

Summary statistics reveal that firms in the treatment group are older and larger than the rest of the sample. Their average sales figures are about 50 percent more than the rest of the firms whereas their operational profit and export figures are about twice the size. The treatment firms also have higher FX credit balances although the difference in this figure is smaller across groups. These findings support our decision to use PSM.

Accordingly, we use PSM to identify a control group of firms that have similar propensity scores to the scores of firms in our treatment group. To estimate propensity scores, we regress treatment status R – using rediscount credit for the first time after July 2020 – on the available last two years' values of

sales, exports[6], domestic sales, operational profits and FX-denominated credit balances along with age and age-squared of firms as of 2020. Moreover, we include fixed effects for provinces where the firms are located and 3-digit NACE sectors of firms' operation industries in the PSM regression. We then estimate propensity scores with the probit specification in Equation (1) where X involves our explanatory variables.

$$Pr(R = 1|X) = \Phi(X'\beta) \qquad (1)$$

Imposing common support[7], we use the nearest neighbor matching technique for the PSM and run probit regression – without replacement. We present the regression results in Table 2. In the probit regression, all variables except operational profits seem to be statistically significant. Accordingly, we are able to match each of the 2,495 treatment firms with a unique firm in the rest of the pool and constitute our sample of firms for main regressions.

Table 2. Probit Estimations for Propensity Score Matching

Log Sales in 2018 (in TL)	-0.0164*** (0.0045)	Log FX Credit Balance in 2019	0.0243*** (0.0043)
Log Sales in 2019 (in TL)	0.077*** (0.012)	Log FX Credit Balance in 2020	0.0143*** (0.0044)
Operational Profits in 2018 (in TL)	0 (0)	Log Export in 2019 (in USD)	0.0419*** (0.0108)
Operational Profits in 2019 (in TL)	0 (0)	Log Export in 2020 (in USD)	0.1558*** (0.0104)
Log Domestic Sales in 2018 (in TL)	0.0152*** (0.0042)	Age	0.005* (0.0029)
Log Domestic Sales in 2019 (in TL)	0.0186*** (0.0041)	Age-squared	-0.0001** (0.0001)

Notes: The estimation includes sector and province fixed effects. Perfect predictor observations of failure from these fixed effects are dropped from estimation and thus sample. ***p<0.01, **p<0.05, *p<0.1

Table 3 presents the means of explanatory variables used in the matching comparing before and after the matching. According to Table 3, the initial difference between the treatment and the control groups seems to be reduced significantly by our matching, except for Operational Profits in 2019, which was not statistically significant in the probit regression's estimations.

[6] To employ the most updated information for the matching procedure, we use export figures for the first six months of 2020 and FX loan balance as of the end of June 2020.

[7] Common support ensures the overlap in the ranges of treatment and control groups' propensity scores.

Table 3. Matching Performance: Balancing Tests for Treatment Firms and Matched Control Firms

	Pre-match			Post-match			Percentage bias reduction
	Mean		p>value	Mean		p>value	
	Treated	Control		Treated	Control		
Sales in 2019	17.02	15.57	0.00	17.02	17.14	0.61	91.67
Sales in 2018	16.02	13.99	0.00	16.02	16.19	0.47	91.71
Exports in 2020	13.05	11.26	0.00	13.05	13.12	0.90	95.83
Exports in 2019	13.74	12.04	0.00	13.74	13.83	0.36	94.98
Domestic Sales in 2019	15.10	12.75	0.00	15.10	15.07	0.55	98.66
Domestic Sales in 2018	14.32	11.79	0.00	14.32	14.43	0.76	95.60
Operational Profits in 2019	4,657,763	2,515,740	0.00	4,657,763	7,723,698	0.16	-43.13
Operational Profits in 2018	4,066,883	2,158,902	0.00	4,066,883	5,364,882	0.67	31.97
FX Credit Balance in 2019	4.66	1.35	0.00	4.66	4.67	0.63	99.84
FX Credit Balance in 2020	4.90	1.42	0.00	4.90	4.94	0.27	98.73
Age	15.99	12.64	0.00	15.99	16.29	0.55	90.97
Age-squared	378.55	269.39	0.00	378.55	393.10	0.43	86.67
Number of Firms	2,495	40,912		2,495	2,495		

Notes: All variables except operational profits, age and age-squared are in logarithmic form.

After we identify the firms of interest, we constitute a monthly panel data set to run our main regressions in the second step. For this purpose, we generate data to cover aggregate monthly transactions in spot FX market, rediscount credit usage, exports, imports and end-of-month FX-denominated credit balances.

3.3. Estimation: Difference-in-Differences Analysis

We estimate the impact of using rediscount credits on firm's FX purchases using the econometric specification presented by Equation (2).

$$y_{it} = \alpha_0 + \alpha_1 T_i + \alpha_2 Post_t + \alpha_3 (T_i \times Post_t) + \alpha_4 Control_{i,t} + sector_i \times d_t + region_i \times d_t + u_{i,t} \quad (2)$$

where y_{it} is the net foreign currency purchaser dummy, which takes the value of one if a firm is a net FX purchaser, and zero otherwise for firm *i* at time *t*. T_i is a binary variable that takes the value one for firms that used rediscount credit for the first time in the post-July 2020 period, and zero otherwise. $Post_t$ takes the value one for all observations from July 2020 and after. The time period captures 41 months from January 2019 to May 2022. $Control_{i,t}$ includes several control variables such as the logarithm of FX-denominated credit balance, the logarithm of TL-denominated credit drawn, the logarithm of net FX-denominated credit amortization, the logarithm of exports, the logarithm of imports, net exporter/importer dummies, and net FX debtor dummy as well as firm, sector, region and time fixed effects. The parameter α_3 is our coefficient of interest, which shows the impact of using rediscount credits on a firm's net FX purchases relative to the control group. To control for time-specific industry and province level shocks (such as demand shocks), we include sector-time ($sector_i \times d_t$) and province-time ($region_i \times d_t$) fixed effects in all specifications.

In addition to using a binary outcome variable, we also estimate the model with a continuous outcome, the net FX purchase amount in USD terms. Moreover, firms may have other types of credits apart from the rediscount credit, given that the rediscount credit program has balance limits and relatively lower coverage of certain credit types. To account for this, we test the robustness of our main estimates to controlling for non-rediscount TL-denominated credits[8] drawn in the corresponding month. Failing to control for the non-rediscount credits may overstate the rediscount credit program's impact, as firms could use different types of credits as complements or substitutes to finance different firm activities based on their cost, maturity, and repayment schedule. In other words, both credit types would affect FX market transactions.

4. Results

4.1. Main Results

We present the main regression results for the binary outcome variable in Table 4, while the results for the continuous outcome variable are presented in Table 5. In both tables, we present two main specifications: baseline results and the inclusion of additional control variables. All independent variables except the binary ones are in logarithmic form.

In Table 4, we use a binary dependent variable that takes the value one if a firm is a net FX purchaser in a given month, and zero otherwise. The baseline estimates in Column 1 of Table 4 show that firms using rediscount credits, on average, have a higher probability of becoming a net FX purchaser than the matched non-users. Column 2 uses FX credit balance and the non-rediscount TL-denominated credits used to control for the effect of non-rediscount credits on firms' FX purchase behavior. Columns 3 and 4 add new variables to control for the effect of being a net FX debtor and being a net importer, respectively. Column 5 presents our preferred specification.

The estimates in Column 5 of Table 4 show that firms using rediscount credits, on average, have a 2.3 percent higher probability of becoming a net FX purchaser than the non-users. Moreover, FX credit balance, TL-denominated credits used and amount of imports are positively associated with being a net FX purchaser. We find that a 1% increase in exports reduces the probability of being a net FX purchaser by 0.23 percent while a 1 percent increase in imports increases it by 0.1 percent. We also find that the net importer firms are more likely to be net FX purchasers compared to the net exporters. These results show that rediscount credits appear to increase firms' probability of being net FX purchaser. Additionally, being an exporter is found to be negatively and significantly associated with being a net FX purchaser.

[8] We only use TL-denominated credit usage since firms are more likely to purchase FX by borrowing in TL.

Table 4. Regression Results (Binary Dependent Variable)

	Dependent variable: net FX purchaser dummy				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
$T_i \times Post_t$	0.02724***	0.02258***	0.02531***	0.02333***	0.02274***
	(0.00527)	(0.00538)	(0.00526)	(0.00536)	(0.00537)
log_fx_credit_balance		0.00128***		0.00128***	0.00130***
		(0.00044)		(0.00044)	(0.00044)
log_tl_credit		0.00437***	0.00436***	0.00439***	0.00435***
		(0.00032)	(0.00033)	(0.00033)	(0.00032)
log_import_usd			0.00099***		0.00097***
			(0.00035)		(0.00035)
log_export_usd			-0.00227***		-0.00230***
			(0.00039)		(0.00038)
net_fx_debtor			0.01739		
			(0.03979)		
net_importer				0.04779***	
				(0.00841)	
Number of Observations	110,885	110,885	110,885	110,885	110,885
R-squared	0.4851	0.4866	0.48690	0.4870	0.4869

Notes: The table presents the regression results for the effect of using rediscount credit on firm's net FX purchases in a binary setting. All columns include firm, time, sector-time, and province-time fixed effects. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 5. Regression Results (Continuous Dependent Variable)

	Dependent variable: net FX purchases (USD)				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
$T_i \times Post_t$	64,739***	60,530***	61,697***	61,593***	60,874***
	(22,255)	(21,112)	(21,144)	(21,934)	(21,075)
log_fx_credit_balance		256.8	264.1		365.5
		(1,866)	(1,865)		(1,873)
log_tl_credit		7,600***	7,623***	7,591***	7,589***
		(1,532)	(1,533)	(1,526)	(1,522)
log_import_usd				-344.1	-347.8
				(1,076)	(1,054)
log_export_usd				-5,477***	-5,483***
				(1,663)	(1,674)
net_importer			74,225***		
			(21,563)		
net_fx_debtor				41,722	
				(468,240)	
Number of Observations	110,885	110,885	110,885	110,885	109,824
R-squared	0.5652	0.5655	0.5655	0.5656	0.56581

Notes: The table presents the regression results for the effect of using rediscount credit on firm's net FX purchases in a continuous setting. All columns include firm, time, sector-time, and province-time fixed effects. Robust standard errors are in parentheses. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

In Table 5, we use the net FX purchase amount as the dependent variable and replicate the regressions presented in Table 4. According to the baseline estimates in Column 1 of Table 5, firms using rediscount credits purchased -on a net basis- approximately 65,000 USD more than their non-treated pairs. Controlling for the non-rediscount FX-denominated credits balance, non-rediscount TL-denominated credits drawn, import amount and export amount in the same month (Column 5 of Table

5) decreases the magnitude of the rediscount credit effect marginally to 61,000 USD, while statistical significance and economic importance remain strong. We find that the net importer firms purchased approximately 74,000 USD more net FX than the net exporter firms (Column 3 of Table 6). The results also show that having non-rediscount FX-denominated debt does not have any significant effect on the firm's net FX purchases. Moreover, using TL-denominated credits is positively and significantly associated with net FX purchases.

According to the results presented in Table 4 and Table 5, firms using rediscount credits, on average, purchase more FX in net terms than their non-treated pairs in the treatment period. This effect is statistically significant and consistent across different specifications.

4.2. Robustness

In this subsection, we discuss the robustness of our results to various considerations. We also present an overview of the potential caveats that are worth considering while interpreting our results. We note that our main specification is already robust to controlling for several fixed effects, NACE Rev. 2 Classification level sector-time and province-time fixed effects. These fixed effects are particularly important to account for various sector and province-specific time-varying shifts, such as demand shifts which may be created by the rediscount credit program. To further strengthen the identification, we also include non-rediscount credits in our main specification. Since we have already presented and discussed these robustness checks above, we now focus on other potential concerns in this subsection.

Table 6. Robustness 1 (Modified Treatment Variable)

	Dependent variable: net FX purchaser dummy	
	(1)	**(2)**
$T_i \times Post_t$	0.03452***	0.03617***
	(0.00484)	(0.00479)
log_fx_credit_balance	0.00129***	
	(0.00043)	
log_tl_credit	0.00431***	0.00423***
	(0.00033)	(0.00033)
log_import_usd	0.00095***	0.00096***
	(0.00035)	(0.00035)
log_export_usd	-0.00233***	-0.00231***
	(0.00038)	(0.00038)
log_fx_credit_amortization		0.00543***
		(0.00064)
Number of Observations	110,885	110,885
R-squared	0.48724	0.48789

Notes: The table presents the regression results for the effect of using rediscount credit on firm's net FX purchases in a binary setting. All columns include firm, time, sector-time, and province-time fixed effects. Column 2 includes sector-time-province fixed effects in addition to other fixed effects. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Firstly, we fix the treatment period as the first three months after using the rediscount credit. By doing so, we aim to focus on a relatively shorter period since there are firms that use rediscount credits over the analyzed period once or more and hence, if they are willing to buy FX after using the rediscount credit, they may do this close to the issue day. In our baseline estimates, we do not control for this effect,

which might cause a downward bias in our estimates. The results for the regressions with our modified treatment variable are presented in Table 6. The results show that firms that used rediscount credits are more likely to be net FX purchasers than their non-treated pairs during the three months after using a rediscount credit. The results also show that there is a positive and statistically significant relationship between FX credit amortization and being a net FX purchaser. Our main results remain similar. We conclude that the length of the treatment period is not likely to drive our results.

Secondly, in Column 2 of Table 6, we also control for additional fixed effects such that we include sector-province-time fixed effects in the regressions. We show that even after controlling for time, sector-time, province-time, and sector-province-time fixed effects, the impact of using rediscount credits on being a net FX purchaser is positive and statistically significant, confirming our main results.

Thirdly, it could also be the case that some outlier firms in terms of net FX purchases are driving our results. To control for this possibility, we eliminate the outliers by winsorizing our dependent variable, namely the net FX purchase amount, at the 5^{th} and 95^{th} percentiles, and re-estimate our preferred specification. Column 1 of Table 7 presents the results for the regression of net FX purchase amount on the treatment and other control variables, whereas Column 2 uses the same setting but with modified treatment variable. The results show that, in both specifications, firms that used rediscount credits purchased -on a net basis- more FX than their non-treated pairs, though the magnitude decreases compared to the results presented in Table 5.

Table 7. Robustness 2 (Eliminating Outliers)

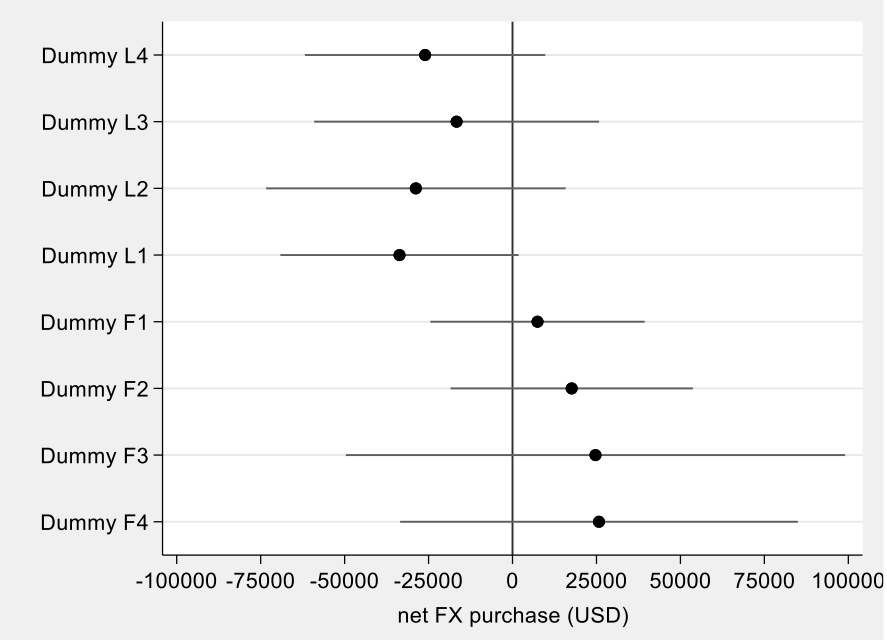
	Dependent Variable: net FX purchases (USD)	
	(1)	**(2)**
$T_i \times Post_t$	20,454***	25,798***
	(2,906)	(3,356)
log_fx_credit_balance	-394.6	-547.5
	(301.8)	(303.1)
log_tl_credit	2,801***	2,801***
	(209.6)	(209.5)
log_import_usd	-532.2***	-517.5***
	(196.9)	(196.8)
log_export_usd	2,865***	-2,850***
	(223.6)	(223.4)
Number of Observations	110,885	110,885
R-squared	0.6125	0.6129

Notes**:** The table presents the regression results for the effect of using rediscount credit on a firm's net FX purchases in a continuous setting. All columns include firm, time, sector-time, and province-time fixed effects. Column 1 uses the usual treatment variable, while Column 2 uses the modified treatment variable. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Fourthly, in such panel data analysis, it is not always possible to assert that the estimated impact is unbiased. In our case, some firms may be continuously buying foreign currency independently of getting rediscount credit or any other credit, and this could result in obtaining biased estimates. To control for this reverse causality, we run a simple regression test. We first create dummy variables for

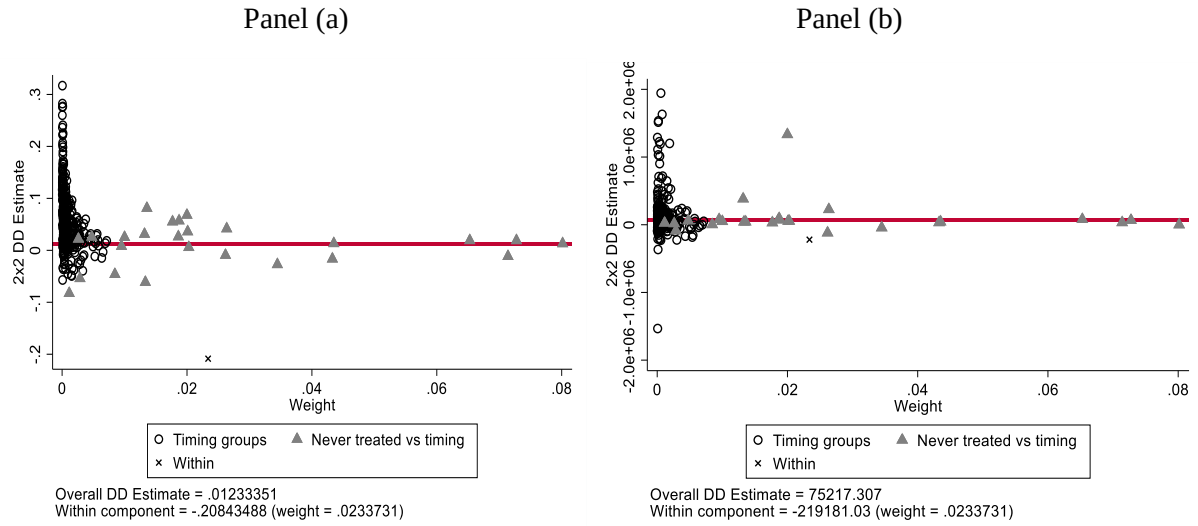
each month of the four-month periods (approximately the average rediscount credit maturity) before and after using rediscount credit. We then estimate the impacts of these dummies on the net FX purchases along with some other control variables that are also used in the main regressions. Figure 4 shows the estimated coefficient and confidence interval for each dummy variable. We find that while the coefficients have a negative trend in the pre-rediscount credit period, the trend turns to be positive in the post-rediscount credit period, suggesting that there is no reverse causality in our regression setting.

Figure 4. Before and After Analysis of the Rediscount Credit Impact on Net FX Purchases



Notes: The figure presents the coefficients and confidence intervals for dummy variables, each of which indicates the month before using rediscount credit (L) or after using rediscount credit (F). The coefficients are estimated from a regression where the net FX purchase is regressed on these eight dummies, log of FX credit balance, net importer dummy, time and sector dummies.

Figure 5. Bacon Decomposition for Understanding DDs with Variation in Treatment Timing



Notes: The figure plots each 2x2 DD components from the decomposition theorem against their weight for the baseline regression with binary dependent variable in panel (a) and continuous dependent variable in panel (b). The red line shows the two-way fixed effects estimate which equals the average of the y-axis values weighted by their x-axis value.

Finally, since our design has variation in the timing of treatment, it may be important to identify the sources of variation and where differences come from. This will help us understand why our estimates changes and whether or not it is a problem. To check the robustness of our results, we implement a Bacon decomposition of a DD estimator with variation in treatment timing, based on Goodman-Bacon (2021). The proposed estimator shows that when treatment turns on at different times, the regression DD coefficient is a weighted average of canonical "2x2" DDs[9] (Goodman-Bacon, 2021). The scatterplots of "2x2" DD estimates and their associated weights show the heterogeneity in the estimated components and also which terms or groups matter most. Summing the weights on the timing comparisons versus the treated/untreated comparisons quantifies how much of the variation comes from timing. We plot the "2x2" DD's against their weight in Figure 5. Panel (a) of Figure 5 presents the results for the regression with binary dependent variable while panel (b) presents the results for the regression with a continuous dependent variable. The results for the Bacon decomposition match closely with the main results. The results show that 65.8 percent of variation comes from the treated/untreated component (where a group which never receives the treatment serves as the control group) while 31.8 percent of variation comes from timing, ensuring the robustness of our results.

Though we employ several robustness tests and ensure the robustness of our results, we have a few limitations. For instance, due to data restrictions, we have to exclude firms that did not have any export transactions in the customs dataset. However, we know there are services exporters and some of them have been using rediscount credits, though their net FX purchases are relatively small. Since we do not have export and import data for this type of firm, we have to exclude them from our analysis. However, these firms are few and would not significantly alter the magnitude of our estimates.

5. Further Extensions and Discussions

In this section, we split our sample into four size groups (i.e., micro, small, medium, and large) to re-estimate our main specifications with different sub-samples. By doing so, we lose some observations since we keep firms that are in the same size group with their matched pairs. Estimation results by size groups are displayed in Table 8. We find that the small-sized firms that use rediscount credits have a higher probability of becoming net FX purchasers than their non-treated pairs (Panel A of Table 8). When we use a continuous dependent variable setting, we find that the medium-sized firms appear to experience the largest impact on their net FX purchase behavior relative to their pairs (Panel B of Table 8). On average, the small-sized firms that use rediscount credits are 2.67 percent more likely to be net FX purchasers than their pairs. When we use the amount of net FX purchase instead of net FX purchaser dummy, we find that both medium-sized and small-sized firms record higher amounts of net FX purchase than their pairs (Panel B of Table 8). We do not find significant results for large- and micro-sized firms.

[9] The term "2x2" DDs refers to a two group/two-period DDs model.

Table 8. Regression Results (Firm Size Groups)

	Large	Medium	Small	Micro
Panel A: Dependent variable: net FX purchaser dummy				
$T_i \times Post_t$	0.02625	0.00988	0.02667**	0.04212
	(0.07792)	(0.01513)	(0.01098)	(0.05191)
log_fx_credit	-0.00584	0.00192	0.00090	0.00473
	(0.01031)	(0.00121)	(0.00093)	(0.00667)
log_import_usd	0.00342	0.00410***	0.00374***	0.00460
	(0.00483)	(0.00080)	(0.00067)	(0.00411)
log_export_usd	0.00622	0.00008	0.00157**	-0.00251
	(0.00623)	(0.00079)	(0.00079)	(0.00296)
Number of Observations	667	18,730	25,141	1,673
R-squared	0.80679	0.53547	0.45882	0.47770
Panel B: Dependent variable: net FX purchases (USD)				
$T_i \times Post_t$	-265,955	57,315***	15,097**	-400.9
	(453,984)	(20,539)	(7,056)	(19,619)
log_fx_credit	-80,587	-1,340	-1,086	-1,399
	(65,724)	(1,624)	(810.1)	(1,657)
log_import_usd	6,870	5,195***	1,585***	2,764**
	(27,029)	(1,190)	(494.1)	(1,245)
log_export_usd	57,900	-63.97968	-250.7	-2,234
	(39,394)	(1,009)	(427.5)	(1,820)
Number of Observations	667	18,730	25,141	1,673
R-squared	0.76199	0.58328	0.39781	0.59822

Notes: The table presents the regression results for the effect of using rediscount credit on a firm's net FX purchases in a binary dependent variable (Panel A) and a continuous dependent variable (Panel B) settings for different size groups. All regressions include firm, time, sector-time, and province-time fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Moreover, the CBRT has made several changes in the conditions regulating the allocation and repayment of rediscount credits to achieve its goals in providing such credits (see Section 2). Among many others, the change that was implemented on September 2021 aimed to improve the effectiveness of the rediscount credits by restricting the access of net importer firms and allowing credits to be used only for payments of the specified expenditures in TL (CBRT, 2021). We further check whether the effect of using rediscount credits on firms' net FX purchase behavior weakened after these changes. To that end, we use the same setting as previously (the preferred specification presented in Table 5) but with the firms that used rediscount credit for the first time in the post-September 2021 period. We report the related regression results in Table 9.

We find that both the statistical significance levels and the magnitude of the estimated coefficients for our variable of interest decrease significantly, implying the partially positive distributional effects of rediscount credit regulations. These results imply that the recent changes in the conditions for allocation and repayment of rediscount credits partially achieved their goals.[10]

[10] We also test whether the significant effect of using rediscount credit on being a net FX purchaser holds for SME firms after the program was explicitly geared to target them, namely the post-September 2021 period. We re-estimate the same regression setting of Table 10 but excluding large firms. We find that the significance level decreases and the magnitude of the effect is reduced compared to the results for the full period.

Table 9. Regression Results (Sub-period)

	Dependent variable: net FX purchaser dummy		**Dependent variable:** net FX purchases (USD)	
	(1)	**(2)**	**(3)**	**(4)**
$T_i \times Post_t$	0.01551**	0.01016	43,242*	43,737**
	(0.00763)	(0.00730)	(22,419)	(17,442)
log_fx_credit_balance	0.00052	0.00058	684.5	-3,334*
	(0.00060)	(0.00060)	(1,356)	(2,022)
log_tl_credit	0.00449***	0.00449***	5,128***	6,028***
	(0.00043)	(0.00043)	(1,474)	(1,340)
log_export_usd	0.00109**	0.00109**	-773.1	-364.7
	(0.00045)	(0.00045)	(1,111)	(957.5)
log_import_usd	-0.00224***	-0.00224***	-1,606	-3,723***
	(0.00048)	(0.00048)	(1,523)	(1,182)
Number of Observations	66,308	66,308	53,779	66,308
R-squared	0.49032	0.49028	0.61468	0.46795

Notes: The table presents the regression results for the effect of using rediscount credit on a firm's net FX purchases for the firms that used rediscount credit for the first time in the post-September 2021 period. Columns 1 and 3 use the usual treatment variable while Columns 2 and 4 use the modified treatment variable. All columns include firm, time, sector-time, and province-time fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Furthermore, we perform additional analysis to better understand the effect of firm-type heterogeneity on firms' FX purchase behavior (Table 10). To that end, we interact our variable of interest ($T_i * Post_t$) with (i) a dummy variable which takes value one for the net importer firms and zero otherwise, and (ii) a dummy variable which takes value one for the net FX debtor firms and zero otherwise. We find that being net importer increases the sensitivity of net FX purchases to using rediscount credit. However, there is no significant impact of being net FX debtor on the sensitivity of net FX purchases to using rediscount credit.[11]

We also check whether firms using rediscount credits differ in terms of buying FX and selling FX behaviors rather than focusing on the net FX purchase behavior. We use the log of purchased FX amount and the log of sold FX amount as dependent variables, and use the same regression setting. We find that firms using rediscount credits increase their FX purchase by 20 percent, but decrease their FX selling by 7.2 percent relative to their matched-control group (Table 11). The results also show that TL-denominated credit allocation is positively and significantly associated with the FX purchase amount.

Finally, we try to understand whether there is a heterogeneity in FX purchase behavior of FX and TL-denominated rediscount credit users. To that aim, a firm is categorized as an FX-denominated rediscount credit user if its FX-denominated rediscount credit share in total rediscount credits is higher than the TL-denominated rediscount share, and classed as a TL-denominated rediscount credit user otherwise. Table 12 shows that FX-denominated rediscount credit users are more likely to be net FX purchasers compared to their matched pairs. On the other hand, we do not find any statistically significant results for the TL-denominated rediscount credit users. These results imply that FX and TL rediscount credit users behave differently in the spot FX market.

[11] We obtain similar results for the binary dependent variable setting. The results are available upon request.

Table 10. Regression Results (Net FX Debtors and Net Importers)

	Dependent variable: net FX purchases (USD)	
	(1)	**(2)**
$T_i \times Post_t$	26,817*	62,051***
	(15,473)	(21,728)
net_importer	30,468	56,419
	(30,532)	(485,781)
$T_i * Post_t *$ net_importer	194,981**	
	(89,603)	
net_fx_debtor		56,419
		(485,781)
$T_i * Post_t *$ net_fx_debtor		-57,674
		(471,481)
log_fx_credit_balance	268.8	
	(1,863)	
log_tl_credit	7,566***	7,597***
	(1,512)	(1,526)
log_export_usd		-5,479***
		(1,664)
log_import_usd		-341.8
		(1,076)
Number of Observations	110,885	110,885
R-squared	0.5658	0.5656

Notes: The table presents the regression results for the effect of using rediscount credit on a firm's net FX purchases in a continuous setting. All regressions include firm, time, sector-time, and province-time fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 11. Regression Results (FX Buying & Selling)

	Dependent Variable: log of FX Purchased	**Dependent Variable:** log of FX Sold
	(1)	**(2)**
$T_i \times Post_t$	0.20117***	-0.07216**
	(0.05721)	(0.03641)
log_fx_credit_balance	0.01115**	0.01070***
	(0.00486)	(0.00321)
log_tl_credit	0.04932***	0.00074
	(0.00304)	(0.00202)
log_import_usd	0.01042***	0.00617***
	(0.00324)	(0.00212)
log_export_usd	0.00454	0.04587***
	(0.00368)	(0.00269)
Number of Observations	58,823	89,684
R-squared	0.54613	0.56045

Notes: The table presents the regression results for the effect of using rediscount credit on a firm's FX purchase and FX selling behaviors in a continuous setting. All columns include firm, time, sector-time, and province-time fixed effects. All columns use the usual treatment variable. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 12. Regression Results (FX-Denominated Users versus TL-Denominated Users)

	Dependent variable: net FX purchaser dummy	
	(1)	**(2)**
$T_i \times Post_t$	0.04546***	0.00352
	(0.00864)	(0.00753)
log_fx_credit_balance	0.00067	0.00162***
	(0.00068)	(0.00060)
log_tl_credit	0.00447***	0.00436***
	(0.00058)	(0.00040)
log_import_usd	0.00073	0.00121***
	(0.00064)	(0.00043)
log_export_usd	-0.00210***	-0.00257***
	(0.00068)	(0.00046)
Number of Observations	38,604	70,363
R-squared	0.51066	0.50290

Notes: The table presents the regression results for the effect of using rediscount credit on a firm's net FX purchases in a binary setting for FX-denominated rediscount credit users (column 1) and TL-denominated rediscount credit users (column 2). All regressions include firm, time, sector-time, and province-time fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

6. Conclusion

In this paper, using firm-credit level micro data, we employ a PSM DD estimator to analyze whether firms using rediscount credits purchase more net FX than their matched pairs. We first merge rediscount credit data from the CBRT with various comprehensive administrative datasets on financial statements, income statements, customs, credit registry, and FX purchases. To deal with the possible self-selection problem, we construct a control group using PSM, and focus only on firms using rediscount credit for the first time after June 2020.

By employing several robustness checks, we find evidence of positive and significant effects of using rediscount credits on the net FX purchase of the treated firms: on average, firms that used rediscount credits have a 2.3 percent higher probability of becoming a net FX purchaser than the non-users. We find that the effect of using rediscount credits on net FX purchases is higher in SMEs than in large firms. Moreover, we also find that FX credit balance, TL-denominated credits drawn and import value are positively associated with being a net FX purchaser. These results show that rediscount credits appear to increase a firm's likelihood of being a net FX purchaser.

On the other hand, we show that the regulatory changes implemented in September 2021 might have weakened the effect of using rediscount credits on firms' net FX purchase behaviors. Similarly, we find that being net importer increases the sensitivity of net FX purchase to using rediscount credit. Putting these two results together, we conclude that directing the rediscount credits from net importer firms to net exporters and preventing their unintended use through efficient regulatory changes may increase the positive contribution of rediscount credit programs to the country's financial stability.

We should note that our results do not consider the behavior of firms operating in the service sector, some of which have used rediscount credits during the covered sample. Moreover, due to data

restrictions, we had to exclude firms that did not have any export transactions in the customs dataset. More importantly, several macroprudential policies have been implemented during our analysis period. These policies of course make it more difficult to isolate the effect of using rediscount credits on firms' FX market behavior. We leave these problems to our future research agenda. However, our results should be taken as a first but important step in addressing the effect of such credit programs on financial stability through FX market transactions in a developing economy context.

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Appendix

Table A.1. Definitions of Variables and Data Sources

Variable	Definition	Label in Regressions	Unit	Source	Original Frequency
Spot FX Purchase	Spot FX purchase of firm via Turkish banks		USD	CBRT	Daily
Spot FX Selling	Spot FX selling of firm via Turkish banks		USD	CBRT	Daily
Spot FX Net Purchase	Spot FX purchase - Spot FX selling		USD	CBRT	Daily
Age	The difference between the current year and the establishment year.			TurkStat-CBRT	Yearly
Sector	Sector code at 3-digit NACE Rev. 2			TurkStat-CBRT	Yearly
Province	Code for the province in which the firm operates.			TurkStat-CBRT	Yearly
Sales	Total sales		TL	TurkStat-CBRT	Yearly
Domestic Sales	Domestic sales		TL	TurkStat-CBRT	Yearly
Operational Profits	Profits from operations		TL	TurkStat-CBRT	Yearly
Domestic Sales	Domestic sales		TL	TurkStat-CBRT	Yearly
Export	Export	log_export_usd	USD	Ministry of Trade	Daily
Import	Import	log_import_usd	USD	Ministry of Trade	Daily
Net Importer (Dummy)	A dummy variable which takes the value one if a firm is net importer in the given year, and zero otherwise.	net_importer		Ministry of Trade	Yearly
FX Credit Balance	Total amount of FX-denominated credit balance in a given month.	log_fx_credit_balance	USD	TBA Risk Center	Monthly
Net FX Debtor (Dummy)	A dummy variable which takes the value one if a firm has more than 15 million USD FX-denominated credit balance, and zero otherwise.	net_fx_debtor		TBA Risk Center	Monthly
FX Credit Amortization	Total amount of FX-denominated credit amortization	log_fx_credit_amortization	USD	BRSA	Daily
TL Credit Usage	TL-denominated loan new use (converted to USD equivalent)	log_tl_credit	USD	BRSA	Daily

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