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The Transmission of Targeted Monetary Policy to Bank Credit Supply

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In this paper I estimate the impact of Targeted Longer-Term Refinancing Operations (TLTRO) on the evolution of lending amounts and rates in Slovenia. I use a combination of difference-in-differences and instrumental variable approach, which together with detail credit register data enable the identification of supply side effects of the TLTRO policy. The results show a supporting impact of targeted operations on bank loan supply, resulting in higher credit growth and lower rates. I find that the TLTRO-I was supportive through both, quantity and price channel, whereas the TLTRO-II only shows a sizeable impact on quantity of credit. Further, I find the transmission was higher through larger and better capitalised banks and the increase in lending was directed more to safe firms.

JEL E52, E58, G21

1. Introduction

Since the global financial crisis central banks around the world have implemented unconventional monetary policy measures to counteract a credit crunch and stimulate aggregate demand. One of the instruments in the arsenal of unconventional measures[1] are Targeted Longer-Term Refinancing Operations (TLTROs) that were first announced by the ECB on June 5 2014. While previous operations (like various LTRO versions) were designed to support the banking system during the peak of the European sovereign debt crisis, TLTRO explicitly targeted lending to the real economy. Its main goal is to enhance the functioning of the monetary policy transmission through bank lending channel. There were three TLTRO series up to now, the latest one (TLTRO-III) started in 2019.

This paper presents estimates of the TLTRO impact on bank lending to corporates. I estimate how banks operating in Slovenia adjusted their lending amounts and prices in response to the TLTRO take-ups. To get the most comprehensive evaluation I use data for both series of operations that concluded by now – TLTRO I and II – and explore if certain firm or bank characteristics matter more for the transmission of targeted monetary policy.

Estimating the casual impact of targeted monetary policy on bank lending is challenging. First, the price of credit and its quantity is

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[1] In the euro area the unconventional measures include various programs of asset purchases, like corporate sector purchase programme (CSPP), public sector purchase programme (PSPP) and pandemic emergency purchase programme (PEPP), longer-term liquidity provision to banks, negative rate policy and forward guidance.

jointly determined by borrowers' demand for credit and banks' incentives to supply credit to the real economy. The estimation of the TLTRO impact would be upward biased if for example less risky firms mainly borrow from banks with more TLTRO funding and they increased their demand for loans relative to more risky firms. Analogously, the results would be biased downward if riskier borrowers demanded more loans compared to safer firms. To tackle this issue, I apply the methodology put forward by Khwaja and Mian (2008) where I estimate how banks that are exposed differently to the treatment (the amount of TLTRO take-up) adjust their supply of loans to the same firm. The approach of Khwaja and Mian (2008) is widely used in empirical banking to identify the supply-side impacts of policy measures.[2] Second, participation in the TLTRO is voluntary, which may result in a selection bias due to non-random assignment to treatment. The direction of the bias can be positive or negative, depending on characteristics of banks that took TLTRO funding and on their lending opportunities or planned expansion of loan supply. I address this selection problem by exploiting the institutional setting of the TLTRO policy, following Benetton and Fantino (2021). In particular, I instrument the actual borrowing of TLTRO funding with the maximum borrowing allowance. Crucially, the borrowing allowance set by the ECB is common across banks and is predetermined at the time of the announcement of both operations. It makes it exogenous to future banks' decisions on loan expansion. At the same time, the borrowing allowance is a relevant instrument as it is strongly correlated with actual TLTRO take-ups.

The results show a positive impact of targeted operations on bank lending, both on credit quantity and price. I find that the first wave of operations (TLTRO-I) was supportive through both, quantity and price channel, whereas the second wave (TLTRO-II) only shows a sizeable impact on quantity of credit. A firm borrowing from a bank with 1 percentage point higher share of TLTRO funding in its balance sheet received 1.57 pp more in credit and 0.17 pp lower lending rate after TLTRO-I introduction. The impact of TLTRO-II on credit growth is larger, at 3.02 pp, but it does not show any impact on lending rates.

TLTRO impact is heterogeneous and depends on bank and firm characteristics. I find the transmission is higher for larger banks and for TLTRO-I it mainly worked through banks that were better capitalised and had higher funding costs. This result tells that the ECB funding helps to reduce bank funding costs and thus support lending activity, but mainly through banks with solid capital position. Further,

both TLTRO I and II show a higher impact on lending to safe and stable firms with higher credit ratings. This result is desired from a policymaker's perspective as this way the increased lending is directed to more productive firms and does not show any unintended consequences of the policy. This paper contributes to the literature on the transmission of unconventional monetary policy. There is a growing body of literature assessing the impacts of non-standard monetary policy measures, like asset purchases, negative rates, long-term liquidity provision and forward guidance, that were taken by the central banks all over the world in response and after the global financial crisis.[3] The literature on central bank liquidity provision, to which my paper contributes, assesses the impact of LTRO that was announced by the ECB in 2011 in response to sovereign debt crisis (see Garcia-Posada and Marchetti (2016) and Crosignani et al. (2020)) and targeted policies (TLTROs), that started in 2014 (see Benetton and Fantino (2021) and Andreeva and Garcia-Posada (2021)). All the authors find a positive impact of liquidity provision on supply of loans. My paper is the first one that compares the impact of TLTRO I and II in a consistent way, using credit register data for the same economy.

The rest of the paper is structured as follows. Section 2 presents the institutional background of TLTRO I and II, whereas Section 3 gives more details on the participation of Slovenian banks in both series with a description of summary statistics and bank behaviour in general. In Section 4 I describe the identification strategy. Results are presented in Section 5. Finally, Section 6 concludes the paper and discusses policy implications.

2. Targeted longer-term refinancing operations

On June 5 2014, the ECB announced TLTRO-I that consisted of eight auctions over a time window of two years. In the first two auctions, banks could borrow up to a maximum allowance of 7% of their amount of eligible loans outstanding as of April 30 2014. Eligible loans include loans to firms and households, excluding loans to households for house purchase. There was an incentive scheme in place that further supported banks to lend. Banks whose net lending in the 24-months ending on April 30 2016 was lower than their benchmark (defined as flow of net lending in the 12-month period before April 30 2014) were required to repay their TLTRO-I borrowings before the maturity of the operations which was set to September 2018. A different incentive scheme was adopted for the remaining six operations, where banks could borrow up to three times the

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[2] For examples see Jimenez et al. (2012), Jimenez et al. (2017), Gropp et al. (2019) and Sivec and Volk (forthcoming).

[3] See for example Altavilla et al. (2016), Boeckx et al. (2017), Ferrando et al. (2019) and Heider et al. (2019).

amount by which their net lending had exceeded the lend-
ing benchmark.

Second wave of TLTRO operations (TLTRO-II) was an-
nounced by the ECB on 10 June 2016. The TLTRO-II con-
sisted of four auctions between June 2016 and March
2017 and has two main distinguishing features compared
to the TLTRO-I. First, the incentive structure of the TLTRO-I
was dropped and throughout the four operations, banks
could borrow up to 30% of their eligible loans outstanding
as of 31 January 2016, net of the outstanding debt from the
first two TLTRO-I operations. Second, banks whose net lend-
ing exceeded their benchmark received a lower rate that
could be as low as the rate on the deposit facility (-0.40%).
On 7 March 2019, the ECB announced the third series of
TLTRO operations (TLTRO-III) that went through several re-
calibrations, mainly due to the COVID-19 pandemic. In-
itially, seven operations were envisaged, taking place
between September 2019 and March 2021. Borrowing
allowance was set on the same level as for the TLTRO-II, i.e.
banks could borrow up to 30% of the stock of eligible
loans as at 28 February 2019. TLTRO-III interest rate was
set at 10 basis points above the average Main Refinancing
Operations (MRO) rate over the life of each operation. It
changed on 12 September 2019, when the rate was set to
equal to the average MRO rate and could be further
dropped for banks that meet the lending benchmark crite-
ria. The rules were further modified on 12 March 2020 in
response to the COVID-19 pandemic. The rate was re-
duced by 25 basis points and the borrowing allowance
raised to 50% of eligible loans. By the end of 2020, the
rate was reduced again by 25 basis points, to as low as -
1%, the borrowing allowance raised to 55% and three ad-
ditional auctions were announced, taking place between
June and December 2021.

3. TLTRO participation and bank behaviour

In total, Slovenian banks borrowed EUR 706 million from
the Eurosystem in TLTRO-I and EUR 1102 million in TLTRO-
II (see Figure 1).[4] Banks utilised a larger share of the bor-
rowing allowance in TLTRO-I, where the take-up amount
was 73% of their borrowing allowance, as opposed to
32% in TLTRO-II. Out of 16 banks that were present in the
Slovenian banking system in 2014, 13 borrowed from the
Eurosystem via TLTRO-I operations, with the average bor-
rowing amount being 2.26% of total assets (Table 1). At
the time of announcement of the TLTRO-II in 2016, there
were 14[5] banks comprising the Slovenian banking system,
of which 10 borrowed via TLTRO-II operations. An aver-
age bank had 5.67% of borrowings from TLTRO-II in its
balance sheet.

The banking environment differed significantly at the time of
TLTRO I and II. Banks in Slovenia were heavily burdened
with non-performing loans during the financial crisis and de-
spite the transfer of a large proportion of defaulted assets
to the Bank Assets Management Company (BAMC), the
NPL ratio[6] of the average bank still stood at almost 19% in
2014 before the launch of the TLTRO-I operations (Table
1). By 2016, when the second TLTRO series started, it
dropped by half to 10%. At the same time, the capitalisa-
tion (measured with capital adequacy ratio) strengthen by
2.4 pp on average between the two rounds of operations,
return on assets increased and lending dynamic picked up,

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[4] The reported take-up amount in TLTRO-I (EUR 706 million) is for the first two
auctions, as, for the identification purposes, only these are used in the analysis
(see Section 4 for the explanation). Total borrowing amount in all eight
TLTRO-I auctions equals to EUR 751 million.

[5] The number is lower than in 2014 due to bank mergers.

[6] Default exposure entering the calculation of the NPL ratio takes into account
borrowers that are either more than 90 days overdue in loan repayment or a
bank assigns them a credit rating D or E (under the five-grade rating scale
from A to E).

Figure 1: TLTRO take-up by Slovenian banks in EUR mln (lhs) and in % of bank total assets (rhs)
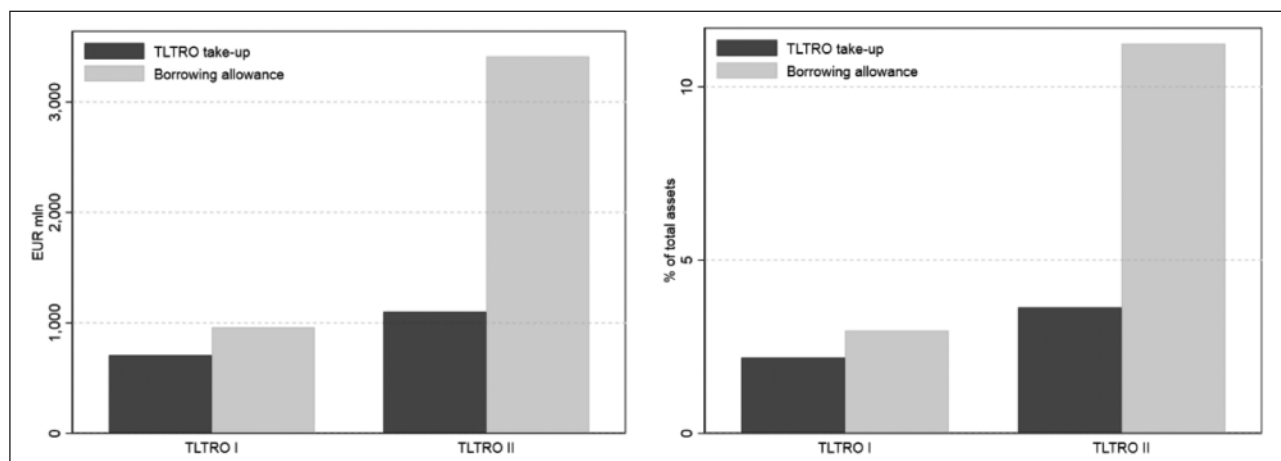
Source: Bank of Slovenia, own calculations. TLTRO take-up amounts are reported for the first two TLTRO-I auctions (September and December
2014) and for all four TLTRO-II auctions (from June 2016 to March 2017).

Table 1: Summary statistics

	TLTRO-I		TLTRO-II	
Total number of banks	16		14	
Number of banks with TLTRO> 0	13		10	
	Mean	St. dev.	Mean	St. dev.
TLTRO in % of total assets	2.26	1.43	5.67	5.00
Borrowing allowance in % of total assets	2.84	1.40	10.32	4.96
Capital adequacy in %	16.10	5.13	18.55	6.20
NPL ratio in %	18.88	12.05	9.78	5.58
Return on assets in %	0.07	1.42	1.18	1,16
Funding costs in %	1.27	0.48	0.54	0.30
Loan growth in %	-4.43	14.93	1.77	21.27

Source: Bank of Slovenia, own calculations
Note: The table reports summary characteristics of banks present during the TLTRO-I and TLTRO-II operations. Threshold date for the calculation of summary statistics in one month before first round of operations, i.e. 2014m8 for TLTRO-I and 2016m5 for TLTRO-II. Defaulted exposure entering the calculation of the NPL ratio takes into account borrowers that are more than 90 days overdue in loan repayment or a bank assigns them a credit rating D or E (in five-grade rating scale from A to E).
Funding costs are total weighted funding costs of a bank, across all the liability sources. Loan growth is reported for the non-banking sector.

turning positive after several years of contraction. Bank funding costs, on the other hand, dropped following a prolong period of accommodative monetary policy. These large differences between banks and between the two rounds of operations point at the importance of controlling for bank characteristics as they might drive the conclusions on the impact of TLTROs on bank lending.

Figures 2 and 3 present the evolution of lending amounts and rates at the time of the two rounds of operations. Each of the four figures shows two lines: the solid line is for banks that participated in the TLTRO, whereas the dashed line is for those that did not.[7] First, note that the evolution

of lending volume and rate before the introduction of the policy (marked with grey lines in 2014q3 for TLTRO-I and in 2016q2 for TLTRO-II) was very similar for the participating and non-participating banks. This is important for the identification with difference-in-difference setup that builds on the assumption of parallel trend in absence of policy. After the policy, banks with TLTRO-I funding seem to have a bit higher evolution of lending and significantly lower rates. The evolution of lending is more positive also for the banks participating in TLTRO-II (with exception of one period), whereas rate drops lower only at the end of the horizon.

Visual inspection in Figures 2 and 3 offers a first indication of differences in evolution of lending amounts and rates after the introduction of policy. It is however not yet a proof, since there are several other factors at play that are

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[7] Note that the number of banks that did not participate in TLTRO borrowing is low, 3 banks in TLTRO-I and 4 banks in TLTRO-II, but their share in total assets is non-negligible: 15% in TLTRO-I and 41% in TLTRO-II. For estimation I use continuous treatment, which drops the concern of low representation of banks without TLTRO funding.

Figure 2: Evolution of lending amount around TLTRO-I (left) and TLTRO-II (right)
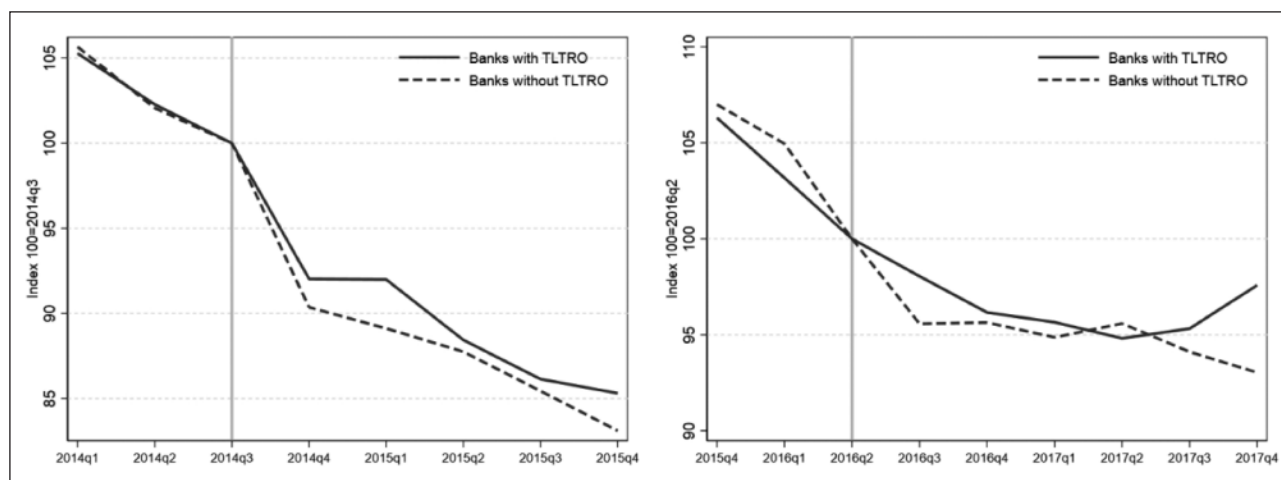
Source: Bank of Slovenia, own calculations.

Figure 3: Evolution of lending rates around TLTRO-I (left) and TLTRO-II (right)
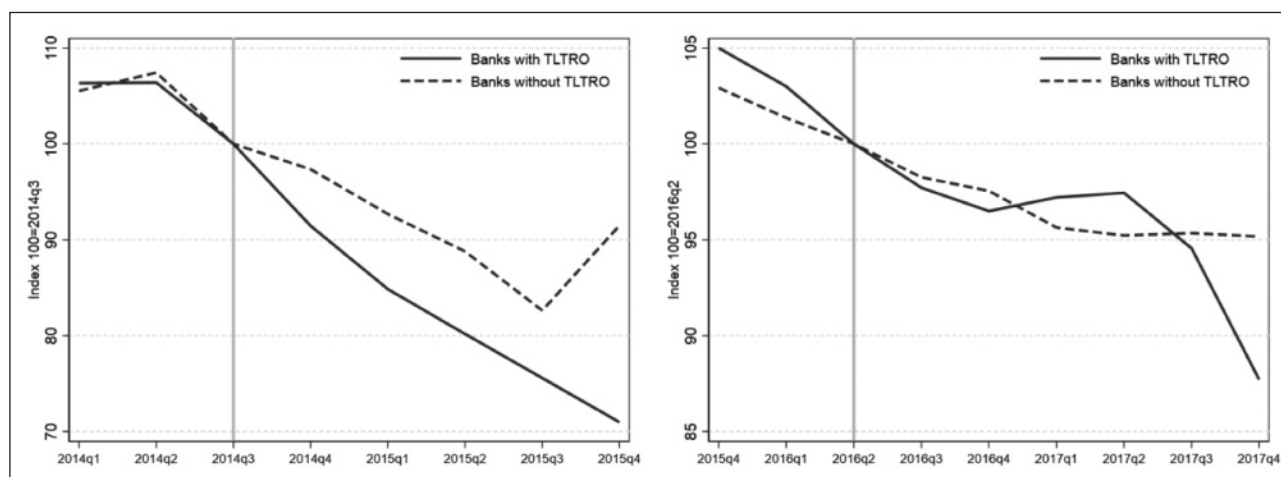
Source: Bank of Slovenia, own calculations.

not controlled for here. First, as already presented above, there are large differences between banks that could drive the results if they are correlated with TLTRO participation. Second, the evolution of lending amount and rate, as presented in Figures 2 and 3 is a result of demand and supply factors. The goal of my analysis is to estimate if banks with higher TLTRO funding adjusted their lending amount and rate differently, i.e. to identify the supply side. In order to do this, I use a difference-in-difference approach with a series of fixed effects that absorb loan demand (see next section). Last, in the two figures I only split banks to participating and non-participating. For estimation, I instead use a continuous treatment, which gives a more clear identification depending on the amount of TLTRO funding a bank borrowed.

4. Identification strategy

Estimating the impact of TLTRO on bank lending poses several empirical challenges. First, TLTROs were implemented by the policymakers as a reaction to macroeconomic conditions with a specific target to promote lending to the real economy. Therefore, macroeconomic shocks correlated to the policy may induce unobservable loan demand shifts that are contemporaneous to the ECB policy introduction, leading to simultaneity and omitted variable bias. Second, participation in the TLTRO is voluntary, which may result is a selection bias due to non-random assignment to treatment. The direction of the bias can be positive or negative, depending on characteristics of banks that took TLTRO funding and on their lending opportunities or planned expansion of loan supply.

To tackle the two issues above, I use the instrumental variable (IV) approach and rely on detailed credit register data to control for loan demand. In the first stage regression I instrument the treatment intensity with a maximum

borrowing allowance within TLTRO I and II. In particular, I estimate the following equation:

$$TLTRO_b = \phi \, Allowance_b + \theta Controls_b + \varepsilon_b$$

where $TLTRO_b$ is TLTRO take-up by bank b and $Allowance_b$ is borrowing allowance that determines maximum amount banks can borrow via TLTRO operations. The model is estimated separately for TLTRO I and II. Both, the actual take-up and the allowance, are measured in percent of bank total assets. Borrowing allowance is a valid instrument as it is correlated with actual TLTRO take-ups (the correlation coefficients equal to 0.748 and 0.457 for TLTRO I and II, respectively) and is exogenous to banks loan supply decisions during both operations.

The exogeneity of borrowing allowance comes from the institutional setup of both operations. The maximum borrowing allowance is set by the ECB in a common way for all banks and is predetermined at the time of announcement of both operations. In particular, as explained in Section 2, in the first two TLTRO-I auctions (in September and December 2014), banks could borrow up to 7% of their outstanding amount of eligible loans on 30 April 2014. By contrast, I disregard the amounts borrowed in the additional TLTRO-I auctions (between March 2015 and June 2016) because the additional borrowing allowances depended on the evolution of banks' eligible lending activities in excess of bank-specific benchmarks. This incentive scheme was dropped for TLTRO-II and throughout the four TLTRO-II operations, banks could borrow up to 30% of their eligible loans.

In addition to the borrowing allowance, first stage regression (equation 1) controls also for other bank characteristics that might be relevant for explaining actual bank take-ups during TLTRO auctions. In particular, the set of

controls ($Controls_b$) includes the following variables: capital adequacy ratio, NPL ratio, ROA, funding costs, log of total assets and annual credit growth at a bank level. All the variables are measured one month before the initial take-ups within both series of operations, i.e. in 2014m8 for TLTRO-I and in 2016m5 for TLTRO-II.

In the second stage, I estimate the impact of TLTRO take-ups on credit growth and lending rates for new loans. The impacts are estimated for non-financial corporates using detailed credit register data that enable to control for loan demand and other unobserved firm characteristics with a series of fixed effects. Whereas both, credit growth and lending rate equation are based on Khwaja and Mian (2008) methodology, they differ slightly in their setup. TLTRO impacts on the evolution of lending amount is estimated for one-year window before/after the introduction of each TLTRO series. In particular, I estimate the following model:

$$\Delta L_{fb} = \beta \times \widehat{TLTRO}_b + \theta Controls_b + D_f + \varepsilon_{fb}$$

where ΔL_{fb} is log change of firm f loan amount in bank b in period between 2014m8 and 2015m8 for TLTRO-I and between 2016m5 and 2017m5 for TLTRO-II. $\widehat{TLTRO}_b$ are the fitted values from the first stage regression. D_f are fixed effects that capture loan demand and other unobserved firm characteristics. The identification assumption is that loan demand is not bank specific.

To uncover the TLTRO impacts on lending rate I make use of reported monthly rates and estimate the following difference-in-difference model:

$$LR_{fbt} = \beta \times (t \geq T) \times \widehat{TLTRO}_b + \theta Controls_b + D_{fy} + D_b + \varepsilon_{fbt}$$

where LR_{fbt} is lending rate for a new loan, taken by firm f in by bank b in month t. D_{fy} are firm-year fixed effects, that capture loan demand and other firm characteristics. D_b captures bank effects that are constant over time. The time frame for the estimation is 2013m1-2015m12 for TLTRO-I and 2015m1-2017m12 for TLTRO-II. The coefficient of interest, β, captures the differential effect of the policy between treated and control banks after each of the two TLTRO series became effective ($t \geq T$). More specifically, T=2014m9 for TLTRO-I and T=2016m2 for TLTRO-II. In addition to the control variables described above, I also control for loan-specific characteristics like loan maturity, credit rating, collateral and interest rate fixation. Last, when estimating the impact of TLTRO-II I control for the still-existing amount of TLTRO-I funding in banks' balance sheets, which might affect the estimated effects of the TLTRO-II.

5. Results

Table 2 presents the main set of results for the impact of TLTRO I and II on credit growth and lending rates for new businesses. The displayed impacts are coefficients in the second stage regressions. Both, TLTRO I and II show a positive and statistically significant impact on credit growth. The same firm is expected to have about 1.6 percentage points higher growth of loans in a bank with 1 percentage point higher share of TLTRO-I funding on its balance sheet. For TLTRO-II, the impact is twice as large, at 3 percentage points. Furthermore, TLTRO-I has a supporting impact on

Table 2: TLTRO impact on credit growth and lending rates[8]

	Credit growth		Lending rate	
	TLTRO-I	TLTRO-II	TLTRO-I	TLTRO-II
TLTRO	1.574**	3.022***	-0.167***	-0.019
Level of estimation	Firm-bank	Firm-bank	Firm-bank-month	Firm-bank-month
Firm controls	Firm FE Firm FE	Firm-year FE	Firm-year FE	Firm-year FE
Bank fixed effects	No	No	Yes	Yes
Number of observations	11558	9606	27398	36844
R-square	0.507	0.599	0.857	0.880

Source: Bank of Slovenia, own calculations

*Note: The table reports the estimated coefficients of the impact of TLTRO I and II on credit growth and lending rates to corporates. The impact on credit growth is estimated on a bank-firm level, using only firms with multiple relations with banks, where the dependent variable is change in log credit amounts between 2014m8 and 2015m8 for TLTRO I and between 2016m5 and 2017m5 for TLTRO II. The impact on lending rate is estimated on firm-bank-time level, using only firms that take loans from multiple banks in a given year. TLTRO are fitted values from first-stage regression, where TLTRO amounts (in % of total assets) are explained with borrowing allowance and bank controls. The same set of controls is included also in the second stage and include: capital adequacy ratio, leverage ratio, NPL ratio, ROA, funding costs, log of total assets and annual credit growth at a bank level. Estimates for lending rates also control for loan characteristics: maturity, credit rating, collateral and interest rate fixation. In addition, TLTRO-II estimates control also for the still existing TLTRO-I amounts in time of TLTRO-II take-ups. Significance: * p<0.10, ** p<0.05, *** p<0.01. Standard errors are clustered at bank level.*

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[8] The robustness of the results was tested with two alternative approaches. First, I conduct a placebo test of a hypothetical introduction of TLTRO policy one year earlier. The estimated coefficients are not statistically significant and their magnitude is close to zero, which rules out that my results are driven by a particular set of confounding factors. Second, I expand the sample by adding single-bank relation firms to increase the external validity of results. I apply the methodology by Degryse et al. (2019) where the demand side is controlled for with industry-location-size-time fixed effects. The estimated effects are of a similar magnitude as those in Table 2.

lending also via rates, as the same firm is expected to receive 0.167 percentage point lower lending rate for a new loan in a bank with 1 percentage point higher share of TLTRO-I funding. TLTRO-II, on the other hand, does not show any impact through the price channel, indicating that it was only operative through adjustment of lending amounts.

Table 3 presents the results of the heterogeneous impact of TLTROs on bank lending, depending on bank and firm characteristics. For this purpose I interact the policy of TLTRO take-ups with indicator variable for the size of bank total assets, capital adequacy and funding costs. The indicator equals one if a bank-specific value of the variable of interest lies above the median. Further, an indicator for firm riskiness equals to one if a firm is assigned a credit rating A or B.

The impact of TLTRO on lending is higher for larger and better capitalised banks, though the latter appears significant only for TLTRO-I (column 2 in Table 3). This result indicates that monetary policy intervention in a form of TLTRO-I had an only limited impact on the real economy through banks that were not in a strong capital position. Later, during the TLTRO-II operations, the capital position of banks strengthened, which could be a reason for non-significant effect of bank capitalisation for the transmission of the TLTRO-II. Similarly, I find that bank funding costs played a role for the transmission of the policy only during TLTRO-I, where the impact of TLTRO funding is larger for banks with higher funding costs (column 3). High funding costs of banks can be an important obstacle for bank loan supply and this result shows that the TLTRO policy alleviates this

issue. During TLTRO-II, banks could raise funds cheaply from the market as a result of accommodative monetary policy. This likely explains a less relevant role of funding costs for the transmission of TLTRO-II.

Turning to firm heterogeneity, the positive coefficient of the interaction term between TLTRO funding and indicator for rating A and B tells that increased lending under both TLTRO operations was directed more to solid and safe firms. This outcome is desirable by the policymaker as less risky firms are expected to be more productive in the long run.

6. Conclusion

In this paper I study the impact of the first two TLTRO series - TLTRO I and II - on bank lending to corporates. In particular, I estimate how banks adjust the quantity and price of credit in response to the two waves of targeted monetary policy. To identify the supply-side effects of the policy I look how banks that are affected differently by the policy adjust lending amount and rate to the same firm. Further, as banks participated in TLTRO auctions on a voluntary basis - potentially resulting in a selection bias - I use the IV approach leveraging on the exogenous ECB allocation rule. The results show a supporting impact of targeted operations on bank loan supply, resulting in higher credit growth and lower rates. I find that the TLTRO-I was supportive through both quantity and price channel, whereas the TLTRO-II only shows a sizeable impact on the quantity of credit.

The findings of my paper have important implications for policymakers, especially regarding the unconventional monetary policy measures. I show that firms benefiting from

Table 3: TLTRO impact on credit growth – bank and firm heterogeneity

	(1)	(2)	(3)	(4)
	TLTRO-I			
TLTRO	0.992	0.754	2.329***	0.643
TLTRO x I(Assets)	1.705**			
TLTRO x I(Capital adeq. ratio)		2.741***		
TLTRO x I(Funding costs)			4.727***	
TLTRO x I(Rating A/B)				1.131*
	TLTRO-II			
TLTRO	2.447***	2.847***	3.391***	2.164**
TLTRO x I(Assets)	3.571***			
TLTRO x I(Capital adeq. ratio)		2.684		
TLTRO x I(Funding costs)			-0.454	
TLTRO x I(Rating A/B)				1.114*

Source: Bank of Slovenia, own calculations
*The table reports the estimated coefficients of the impact of TLTRO I and II on credit growth, exploring bank and firm heterogeneity. I() denotes indicator variables that equal one when a bank-specific value for the variable in brackets is above the median, except for Rating A/Bwhere it equals one when a firm is assigned rating A or B. Significance: * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Standard errors are clustered at bank level.*

the TLTRO operations were mostly stable and less risky firms, which are expected to be more productive in the long run. The results also reveal the importance of stable banking environment, as the propagation of monetary policy stimulus is larger through better capitalised banks. This holds especially for the impact around the TLTRO-I introduction when banks were still building-up their capital base. By the time of the second TLTRO programme, the capitalisation of the Slovenian banking system increased by 2.4 pp in terms of capital adequacy ratio, and hence bank capitalisation played a lesser role in the propagation of targeted monetary policy.

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