The 2014 Russia shock and its effects on Italian firms and banks*

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Abstract

This paper investigates how a shock in an export market propagates to the exporting country's banking system. Using the dual shocks of sanctions and falling oil prices suffered by Russia in 2014, it analyses the effects on Italian firms exporting to the Russian market and the reaction of banks whose loan portfolio was disproportionately biased towards them. Whereas the shock implied a significant decline in sales, it did not have an impact on the overall amount of credit available to these firms. However, Italian banks relatively more exposed to Italian exporters to Russia cut their overall credit supply, especially *vis-à-vis* riskier borrowers, while they expanded credit towards financially sound firms hit by the Russia shock, in an attempt to let them cope with the liquidity shortfall. Overall, this suggests that export shocks might propagate through the financial sector, inducing a credit reallocation among borrowers and reaching firms that are not directly hit by the shock.

Keywords: Russia shock, credit supply, bank capital, trade shocks.

JEL codes: G21, F10.

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1 Introduction

In 2014 Russia suffered from the dual shocks of sanctions and lower oil prices, leading to a sharp fall of its imports from the rest of the world. This large import contraction hit exporters from several countries, including Italy, whose sales to Russia (the third largest extra-EU market for Italy's exports) fell by 35 per cent over two years. This episode represents an interesting case study to trace out how a demand shock propagates to the exporting country's banking system. Specifically, we investigate how this negative shock to export market opportunities for Italian companies affected banks' credit supply and firms' credit demand.

The Russia shock shares some similarities with the recent Covid-19 pandemic shock. Indeed, it represents an exogenous and unexpected reduction in revenues that generates for affected firms a sudden liquidity shortfall and a likely increase in their risk of insolvency. Although the magnitude of the two shocks for the Italian economy greatly differ, for the same reason the Russia shock was not accompanied by any exceptional public support measure (e.g. loan moratoria, public guarantees on new credit, grants, exceptional temporary lay-off schemes), and as such it can provide some hints on how bank credit would have adjusted absent any policy support measure. In the context of the recent war between Russia and Ukraine, our paper highlights how the credit market may act as an additional transmission channel of the shock towards firms, even to borrowers with no direct exports to the Russian market. At the same time, it differs from the latter episode as it did not lead to a dramatic surge in energy prices for all companies, in turn allowing to better identify Italian firms more directly affected by the shock.

To this end, we use uniquely detailed data on the exposure of Italian firms and banks to the Russia shock. We combine credit register data, customs data on the universe of export/import transactions of goods and banks' and firms' balance sheet data. We identify Italian exporters for which sales to the Russian market accounted for a significant share of their turnover. We then pin down a number of banks whose loan portfolio was relatively more oriented towards these exporters, that in turn were disproportionately hit by the shock. We apply a difference-in-difference strategy, covering the quarters immediately

before and after the shock (which took place in mid-2014), and estimate the effect of the Russia shock on credit supply (using the Khwaja and Mian (2008) approach).

Our results provide several insights on how the trade shock affected both firms and banks. First, we consider the real effects of the shock on the performance of firms that had a significant share of revenues (at least 9 per cent, corresponding to the top decile) coming from the Russian market (henceforth *hit-borrowers*). At end-2016 these firms suffered from a significant decline in revenues (-17 per cent) relative to pre-shock levels, hitting sales to Russia but also to other foreign destinations and, to a lower extent, domestically. The drop in revenues was accompanied by an increase in leverage, lower liquidity and a higher propensity to default on their loans (around 2 per cent higher over a three-year horizon relative to other comparable firms before the shock).

Second, we study the implications of the Russia shock in terms of the overall availability of credit for more affected firms, further exploring whether banks changed their overall lending policies. We find that for *hit-borrowers* the overall availability of credit, as measured by the sum of outstanding credit and loan commitments, did not change *vis-à-vis* firms that were not directly hit by the shock, although the former experienced a significant increase in drawn credit, mostly due to a more intense utilization of credit lines to cope with the increased liquidity needs. On banks' side, we find an important spillover effect as those in the top decile of the share of credit exposure towards Italian exporters to Russia (62 banks, henceforth *hit-banks*) decreased by around 2.4 per cent their supply of credit to the universe of their borrowers.

We interpret the negative spillover effect of the Russia shock on the credit supply of *hit-banks* as closely related to the bank capital channel (Bernanke and Lown, 1991; Peek and Rosengren, 1995; Thakor, 1996; den Heuvel, 2006) stressing the contractionary effects of negative shocks to capital on bank credit supply. The capital channel rests on two main features that find real-world support: the imperfect substitutability among banks' liabilities, in particular between debt and equity, due to financial frictions (e.g. moral hazard or asymmetric information), and the existence of capital regulation. The weaker a bank's balance sheet, the greater an adverse shock to capital would reduce bank lending because of the capital requirement and the cost of issuing new equity. To the extent

that the heightened credit risk of exporters to Russia implied higher future losses, our shock is equivalent to a negative shock to the prospective capital position of the bank. Importantly, we find that the credit supply reduction was larger for lenders with weaker balance sheets, especially in terms of share of non-performing loans.

Our most insightful result regards how the Russia shock had an impact on the allocation of credit between more affected banks and firms. After the shock *hit-borrowers* that previously had a good credit rating tended to receive a disproportionate amount of credit from *hit-banks*. At the same time, these banks slightly cut their lending to non *hit-borrowers*, suggesting a negative spillover of the shock to non-affected borrowers, especially if they had limited chances to borrow from other lenders. Importantly, we find that this reduction in *hit-banks*' credit supply involved borrowers, both hit and non-hit by the Russia shock, that were already risky before the trade shock. Moreover, only *hit-borrowers* with a moderate level of exposure to Russia (i.e. firms for which exports to Russia amounted to less than 30 per cent of their total turnover) benefited from the credit support of *hit-banks*. In contrast, these banks reduced credit supply to companies with an excessive level of sales concentration in Russia, as this was likely to lead to a permanent impairment of companies' performance.

Overall, this credit reallocation enacted by *hit-banks* across different borrowers suggests the implementation of a de-risking strategy while contemporaneously supporting sound firms more affected by the Russia shock. This lending pattern can be considered consistent with the bank capital channel. Indeed, *hit-banks* were relatively more affected by the default of *hit-borrowers*, and in turn had a higher incentive to limit future losses from firm insolvencies – that would end up worsening their capital position – through the granting of new credit to *hit-borrowers*, in an attempt to let them cope with the liquidity shortfall; at the same time, these lenders also tried to preserve their capital position by reducing exposures to risky firms.

Our interpretation that lending strategies reflect the working of the bank capital channel is supported by the fact that our results are robust to the inclusion of variables capturing bank specialization in specific economic sectors or trade finance activities (Paravisini et al., 2015), as well as a dummy for the main lender that proxies the effect of relation-

ship lending (Petersen and Rajan (1994), Berger and Udell (1995)).[1] Lastly, we stress that higher lending to *hit-borrowers* from *hit-banks* shock should not be considered related to zombie lending. Indeed, sound *hit-borrowers* that were not in a structurally weak position before the shock received additional credit from *hit-banks*, while the opposite occurred for risky firms. Although after the shock *hit-borrowers* ended up defaulting more frequently on their loan obligations, the uncertainty surrounding the shock duration might have suggested it was just temporary or firms had more chances to promptly expand sales in other markets, and as such it justified banks' liquidity support as their businesses were fundamentally viable.

Our work contributes to several lines of research. First, our result that banks more exposed to the Russia shock extended relatively more credit to *hit-borrowers* is related to the recent papers by Favara and Giannetti (2017), Giannetti and Saidi (2018) and Galaasen et al. (2020) on the credit effects of shocks to firms' performance. The former two papers point out that lenders with high market shares in distressed sectors of the economy have a higher incentive to internalize negative spillovers due to fire sales episodes on collateral assets, and in turn provide relatively more liquidity in an attempt to attenuate insolvencies. Whereas the fire sales channel point out the importance of the *market* share of loans that each lender has in specific sectors, we instead highlight the role played by the share of loans to *hit-borrowers*, a measure that is closely related to banks' exposure to the Russia shock. Similarly, Galaasen et al. (2020) show how bank level negative shocks to larger firms, so called "granular credit risk", lead to a reduction in the interest rates charged on new loans to these affected borrowers but, crucially, to a tightening of credit supply conditions for smaller firms.

A second strand of literature related to our work is the one on the impact of trade shocks on banks such as Federico et al. (2019) on the exposure of Italian banks to the China shock and the subsequent loan portfolio adjustment. Our paper provides a complementary perspective: whereas Federico et al. (2019) focus on an import competition

[1]The relationship lending theory suggests that banks' credit support to firms with liquidity shortfalls is idiosyncratic and not linked to considerations related to the overall bank loan portfolio. In other words, if our results were spurious as simply reflecting the existence, before the shock, of a relationship lender, then after the inclusion of this variable our measure of bank exposure to the Russia shock should not be statistically significant. On the contrary, we find that our results continue to hold.

shock, we look at an export demand shock. Moreover, the two shocks differ in terms of timing and propagation: in contrast to the gradual and cumulative nature of the China shock, the Russia shock was a much smaller shock, but severely hitting in a short window of time a specific group of firms that were particularly exposed to an export market.[2]

A third related line of research focuses on how banks and firms react to liquidity shortfalls, a literature that has seen a rapid development after the Covid-19 shock (Chodorow-Reich et al., 2021; Li et al., 2020; Kapan and Minoiu, 2020). Relative to these works, our episode provides insights on the credit dynamics for a smaller subset of firms, but without the presence of the generous public support programs implemented immediately after the pandemic broke out.

The rest of the paper is structured as follows. Section 2 provides a background of the two shocks hitting the Russian economy in 2014 and of the exposure of Italian exporters. Section 3 describes the data sources. Section 4 presents the econometric strategy. Section 5 reports the main results. Section 6 discusses the robustness of our findings. Finally, Section 7 concludes.

2 Background

After almost 15 years of largely uninterrupted growth, in 2014 the Russian economy was hit by two large shocks. The first is related to the international sanctions introduced by a large number of countries following the Russian annexation of Crimea in February-March 2014. The sanctions were imposed by the United States, the European Union (EU) and other countries between March and April 2014. The measures were then intensified during the early summer of 2014. Sanctions included: an embargo on arms, dual-use goods and specific mining equipment; restrictions on the issuance and trade of financial instruments with maturity of more than 30 days to selected Russian state-owned banks and energy companies; travel bans, asset freezes and payments restrictions against a number

[2] A different strand of literature looks at the economic effects of sanctions (including Crozet and Hinz (2020) on international sanctions *vis-à-vis* Russia in 2014, and Crozet et al. (2021) for a broader set of sanctions). However, this literature has typically focused only on the effects on firms, neglecting spill-overs to the banking sector.

of Russian individuals and entities.[3] In August 2014 Russia responded with sanctions against a number of countries, including a counter-embargo on certain food and agricultural imports from the United States, the European Union and other countries.

The second shock was the sharp decrease in oil prices, which fell by half between June and December 2014. A variety of factors played a part, including demand weakness and increased supply (especially in countries not belonging to the OPEC). Russia, as a major exporter of energy products, was hardly hit by the collapse in oil prices: the deterioration in terms of trade was equivalent to 30 per cent. Lower oil prices and sanctions put significant pressure on the ruble, which recorded a sharp depreciation towards the end of 2014. They also contributed to the recession in 2015, when GDP contracted by 4 per cent. The external adjustment was mainly driven by a deep import contraction: import volumes fell by 25 per cent in 2015.

The collapse in oil prices differentiates the 2014 Russia shock from the one following Ukraine's invasion in 2022; in the latter case energy prices accelerated an already increasing trend that started in 2021 as world economies gradually came out of the most intense phase of the Covid 19 pandemic. In this respect, the 2014 Russia shock considered in this paper combines two elements – heightened trade obstacles and the sharp decline in oil prices – that both unambiguously lower the Russian demand for imported products and hence it represents a negative demand shock from Italy's perspective. On the other hand, firms' input costs, especially those related to energy prices, were not negatively affected by the 2014 Russia shock, in contrast to what happened in 2022.

This negative demand shock to export market opportunities hit all the main countries selling to Russia, including Italy. Russia was an important destination market for Italian exports of goods. In 2013 it was the third largest extra-EU market in terms of export value. Italy's exports to Russia fell by 35 per cent in value terms between 2013 and 2015. The decrease was broad-based across sectors. Exports fell not only in products directly hit by the EU embargo and by the Russian counter-embargo (which accounted only for just a few percentage point share of Italy's exports to Russia), but also in the vast majority of

[3]The sanctions by the European Union and United States continue to be in effect to this date; further extensions have been introduced over the subsequent years and they were further scaled up following the Ukraine invasion in 2022.

remaining products.

We exploit the exogenous nature of the dual shocks (oil prices and sanctions) underlying the import contraction to investigate how a negative shock to export market opportunities propagates to firms and banks in the exporting country.

3 Data

Our data set comprises granular information derived from multiple sources. First, we draw data on credit relationships between banks and non-financial corporations from the Bank of Italy Credit Register. It includes the universe of credit exposures exceeding the €30,000 threshold (differentiated by type of loan instrument) and reported on a monthly basis by all Italian banks and non-bank financial intermediaries. We aggregate loans to firms at the banking group level with a break-down by credit granted and credit outstanding, i.e. the amount agreed and the amount effectively drawn by the borrower; the two variables may substantially differ, especially for credit lines. Credit granted and outstanding are further broken down by instrument (e.g. credit lines and term loans), and for export purposes (trade finance). All the credit relationships are further characterized by additional attributes, named *Bank-firm time-varying controls*, that include the presence and the share of collateral over total loan amount granted. We exclude borrowers with non-performing loans (NPLs) as their credit relations are usually freezed and do not react to new shocks.

The second main source of data is the amount of goods exports available from the Customs and Monopolies Agency. They include annual exports and imports by firm, product and counterpart country and cover practically the universe of Italian exporters and importers (with the exception of sole proprietorships). Products are defined at the 6-digit level of the Harmonized System (HS) classification. Firms are reported with a unique identifier (VAT code) that can be easily matched to the credit register and firm balance sheet data.

The data set is further enriched by details on firms' balance-sheets, derived from the Cerved data base on annual balance-sheets of corporations. Our sample consists of

450,000 firms for which we have information on total assets, share of liquid assets, financial leverage and riskiness.

The fourth pillar of our data set are bank-level information obtained from supervisory statistics. Bank data are aggregated at the banking group level, if applicable, or at bank level in the case of stand-alone intermediaries, and include the universe of banks and non-bank financial intermediaries belonging to banking groups. In total our sample includes 620 banks. The balance-sheet indicators include total assets, capital and reserves to total assets ratio, share of non-performing loans (NPLs) over total loans (NPL ratio), loan-to-deposit ratio and share of government debt securities over total securities holdings.

Table 1 and Table 2 report summary statistics for the variables. Table 3 provides a description of the variables and data sources.

4 Empirical strategy

Our empirical strategy starts from the identification of Italian firms that exported to Russia. In 2013 sales to Russia accounted for 2.8 per cent of Italy's overall exports of goods (0.7 percentage points in terms of GDP). Russia was the eighth market in terms of export value (the third extra-EU market for Italian exporters, after the United States and Switzerland). Exporters to Russia were mainly active in the industrial machinery, fashion industry, other transport equipment and furniture. They also showed a regional concentration, especially in the North-East and Centre-East regions of Italy (Veneto, Emilia Romagna, Marche). Products hit by the EU embargo and by the Russian counter-embargo accounted for a very small fraction of Italian firms' total exports to Russia (0.9 and 1.7 percentage points, respectively).[4] For this reason we focus not only on products hit by sanctions but on the entire set of products traded with Russia.

Our sample of firms exporting to Russia include on average around 22,000 firms between 2011 and 2013. The share of exports to Russia over total sales varies significantly across firms: for a subset of around 2,200 firms, exports to Russia account for at least 9 per cent of their total sales (including domestic sales). We use this threshold – which co-

[4] We follow the product list provided by Crozet and Hinz (2020).

incides with the last decile of the distribution – to identify the subset of firms that were more severely hit by the Russia shock. Given that we focus on their credit relations, we label these firms as *hit-borrowers*.

As a preliminary step, we verify that the Russia shock was indeed a negative demand shock using the following cross-sectional first-differences regression:

$$\Delta Y_i = \beta HitBorrower_i + \alpha_j + \alpha_p + \epsilon_i \tag{1}$$

where ΔY_i is the change in an outcome variable for firm i such as firm revenues ($\Delta Sales$), financial leverage ($\Delta Leverage$), liquidity ($\Delta Liquidratio$), classification in bad debt status ($Bad\ debt$) or other non-performing loan status ($OtherNPL$). For the first three variables all changes are considered with respect to the end-2016 value relative to the two-year average pre-shock (i.e. 2012-13). The $Bad\ debt$ and $OtherNPL$ variables are instead dichotomous dummy variables and the regression model is effectively a linear probability model. The variable $HitBorrower_i$ is a dummy equal to one if the firm's exports to Russia before the shock amounted to at least 9 per cent of its total sales (including domestic sales). The regression controls for sector j (NACE 2-digits) and province p fixed effects.

We then focus on credit dynamics that represent the core of our empirical strategy. We start considering how credit changed for hit-borrowers relative to other firms after the Russia shock. For this purpose we use quarterly firm-level data on stocks of outstanding and granted credit and estimate the following regression:

$$lnC_{it} = \beta HitBorrower_i \times post_t + \alpha_i + \alpha_{jt} + \alpha_{pt} + \epsilon_i \tag{2}$$

where α_i is a time-invariant firm fixed effect, α_{jt} and α_{pt} are sector-time and province-time fixed effects. As a robustness we also run an analogous regression with bank-firm data where we include a time invariant bank-firm fixed effect and time-varying firm controls.

Next, we focus on how banks relatively more affected by the Russia shock adjusted their credit supply. To this end, we compute the following measure of pre-shock bank

exposure:

$$BankExposure_b = \frac{\sum_i C_{ib} \frac{ExpRussia_i}{Sales_i}}{\sum_i C_{ib}} \tag{3}$$

which corresponds for each bank b to a weighted average of the share of exports to Russia over total sales for all its borrowers, where weights account for the share that a given firm's credit has over total credit provided by the bank. This is a continuous measure of the weight of loans to exporters to Russia in a bank's overall loan portfolio to firms.

For the vast majority of lenders, exposure is negligible, given that banks usually tend to have a diversified portfolio. Nevertheless, banks in the last decile of the distribution of $BankExposure_b$ (62 banks) record more significant values (above 0.42 per cent, Figure 1). These are typically local or regional banks operating in areas specialized in products that are among the top exports to Russia. We single out these banks with the dummy $HitBank_b$ that takes value 1 for banks in the top decile and zero otherwise. In our specifications we use the latter variable to improve the interpretation of the magnitude of the coefficients and to take into account possible non-linear effects; nonetheless, all our results are qualitatively unchanged when substituting $HitBank_b$ directly with $BankExposure_b$ in our regression specifications (material available upon request).

We estimate the effect of the Russia shock on banks' credit supply, following the Khwaja and Mian (2008) approach:

$$lnC_{ibt} = \beta HitBank_b \times post_t + \gamma BankCharacteristics_{bt} + \alpha_{it} + \alpha_{ib} + \epsilon_{ibt} \tag{4}$$

where the dependent variable is the log stock of loans granted by a bank to a firm. The main explanatory variable is the interaction between the dummy $HitBank_b$ and a $post$ dummy which is equal to one after the third quarter of 2014 and zero before. We control for firm-time fixed effects, which absorb time-varying shocks to credit demand at the firm level, and bank-firm fixed effects, which take into account time-invariant factors underlying the matching between firms and banks. We also control for time varying bank controls (assets, loan-to-deposits ratio, capital ratio, NPL ratio, share of government securities holdings). To explore differential effects with respect to bank characteristics, we

also run the same regression model adding separately the interaction term given by the product of each bank characteristics with $HitBank_b$ and the post dummy.

Lastly, we explore the interaction between more affected firms (*hit-borrowers*) and banks (as captured by $HitBank_b$). Specifically, we estimate the regression model:

$$lnC_{ibt} = \beta HitBank_b \times post \times HitBorrower_i + \gamma BankCharacteristics_{bt} + \alpha_{it} + \alpha_{ib} + \epsilon_{ibt} \quad (5)$$

where the triple interaction term $HitBank_b \times post \times HitBorrower_i$ captures the possible differences in the lending response of more affected banks with respect to hit and non hit-borrowers. To explore the channels of the effects across firms with different risk profiles we perform an analogous regression adding an additional interaction to $HitBank_b \times post \times HitBorrower_i$ with a dummy for riskier firms. Similarly, in a robustness check we test whether our results are driven by relationship lending we add an additional interaction with a dummy identifying for each firm its main lender.

5 Main results

We proceed to present our main results as follows. First, we provide an overall view of the impact that the shock had on firms more exposed to the Russian market by comparing the post-shock evolution of several firm outcome variables (sales, leverage, liquidity, loan default) relative to less affected firms. Second, we consider how the shock changed the dynamics of credit, both in terms of granted and outstanding amounts, for banks and firms that were more severely hit by the shock, also exploring the heterogeneity in terms of bank and firm characteristics. Third, we investigate how lenders differently affected by the Russia shock adjusted their credit supply to firms that were more severely hit by the shock *vis-à-vis* other firms. This last analysis is crucial to understand how the concentration of credit, and the related loan default risk, gets redistributed across the banking system after a subset of firms suffers from a large negative shock on their business operations.

5.1 Russia shock and the real effects on hit firms

Although the aggregate impact of the Russia shock on the Italian economy was modest, its effect on exports to Russia has been large, with a 35 per cent reduction between 2013 and 2015. This large drop implies that the effect on firm sales was very heterogeneous across firms as they were differently exposed to the Russian market. In 2011-13 more than 22,000 firms exported to Russia and for around 2,200 of them the share of Russian exports was above 9 per cent of their yearly revenues. In what follows we refer to this group – coinciding with the last decile of the firm distribution with respect to the share of revenues from Russia – as *hit-borrowers*.

Table 4 provides an overview of the different performance of *hit-borrowers* after the Russia shock. We consider a cross-sectional regression model for the post-shock change of several outcome variables between the average of the two-year pre-shock period and the value in 2016: firm revenues ($\Delta Sales$), financial leverage ($\Delta Leverage$), liquidity ($\Delta Liquidratio$), classification in bad debt status ($Bad\ debt$) or other non-performing loans ($OtherNPL$); all regressions include several firm control variables at their pre-shock levels as well as province and sector fixed effects.

We find that *hit-borrowers* display a substantial worsening of their performance – the drop in firm sales relative to other comparable firms amounts to 17 per cent over a three-year period – and a heightened financial vulnerability as pointed out by the increase in financial leverage and decrease in liquidity. As a result, we also find a substantially higher likelihood of being insolvent on debt obligations: the estimated transition to either bad debt or other milder NPL statuses is almost 2 percentage points higher than for other firms.

Table 5 further investigates the decline in firm sales. Columns (1) and (2) decompose total sales in domestic sales and exports. Column (3) replicates the specification in column (2), exploiting the full detail available in customs data by computing the dependent variable as the log change in exports for each product-country combination (as opposed to the log change in total exports).[5] Finally, columns (4) and (5) further decompose export

[5]This specification allows us to control for demand shocks at the product-country level. On the other hand, it takes into account only the intensive margin and not the extensive margin (i.e. if *hit-borrowers* stop

performance according to the destination of sales (Russia and other countries, respectively). The results show that exports to Russia declined the most for *hit-borrowers*, as expected given the nature of the shock. However, *hit-borrowers* recorded a decline also in sales towards other foreign destinations and, although the coefficient is marginally significant, even domestic sales. This is consistent with the hypothesis that the shock in the Russian market and the associated negative impact on cash flows might have hindered their performance in other markets (especially other foreign markets, given the higher financial needs typically associated with the export activity).

Overall, this evidence points out that the Russia shock represented a severe challenge to the business of a subset of Italian firms. In this respect, the sudden drop in revenues due to the increasing difficulties in exporting has analogies with the Covid-19 crisis, even if the number of firms affected is much smaller. But differently from it, the firms affected by this trade shock did not have the chance to take advantage of the generous public support programs (e.g. legislative moratoria, public guarantees, grants) implemented in response to the pandemic crisis. Therefore, the 2014 Russia shock represents an interesting episode to analyse how credit supply and the structure of lending relations change in response to a demand shock that affects a non-negligible subset of Italian firms, without public support measures alleviating the adverse effects.

5.2 Credit effects on *hit-borrowers* and banks

We now turn to consider how the worsened business performance of *hit-borrowers* influenced the amount of credit available to them, as measured by the amount of granted loans, as well as their actual draw-down of credit, as measured by the outstanding loan amount. Initially, we rely on a firm level analysis that allows to capture the overall change in credit, i.e. irrespective of any change in the distribution of loan amounts across lenders, an important issue that we explore later.

Notwithstanding the severity of the shock, *hit-borrowers* did not suffer, on average, from a contraction in the overall amount of credit available in the post-shock period (Ta-

exporting in a given product-country combination).

ble 6, panel a). Yet, the drop in revenues substantially increased their credit demand (Table 6, panel b): on average, the growth in outstanding credit was 7,4 percentage points higher than that observed for other comparable firms. The increase was especially marked for loan instruments such as credit lines that are most suitable to cope with liquidity needs; no such increase is instead observed for trade finance loans, presumably reflecting the difficulties to find new business opportunities abroad to substitute for the lost export sales to Russia. Importantly, we do not find any statistically significant differential effect on granted and outstanding loans (Table 7) for firms that relied more on credit from banks that had lent a disproportionate amount towards firms more exposed to the Russia shock.

Next, we consider whether the Russia shock had effects on the credit supply of the banks more (indirectly) exposed to Russia through bank-firm links, i.e. those for which the dummy $HitBank_b$ takes the value of 1. In the baseline regression we control for firm-time and bank-firm factors and test whether an higher bank exposure had an effect on their overall credit supply (Table 8). We find that in the post-shock period between Q2-2014 and Q4-2015 banks relatively more exposed to the Russia shock cut lending by approximately 2.4 per cent, a rather large magnitude considering the overall limited weight of Italian exporters to Russia in their loan portfolio to NFCs (around 1 per cent on average). Interestingly, Figure 2 points out that the lending pattern between *hit-banks* and the other banks changed after the shock, with the former reducing their loan supply, especially after the second quarter following the shock.[6]

Lastly, we explore whether the reduction in credit supply was heterogeneous across banks with different characteristics (Table 9). The results are consistent with a bank capital channel: weaker banks in terms of non-performing loans, as well as banks with a higher loan-to-deposit ratio, have less buffers to absorb a negative shock on the quality of their assets; in turn, they adjust relatively more their credit supply to pursue a de-risking strategy of their balance sheets.

[6]In additional robustness tests, available upon request, we find that the negative effect on credit supply persists even 8 quarters after the shock.

5.3 Interaction between *hit-banks* and *hit-borrowers*

We now turn to consider how banks differently adjusted their loan portfolio allocation in the aftermath of the Russia shock with respect to hit vs. non-hit borrowers. To do so we consider the triple interaction among $HitBank$, a dummy $post$ for the period after the shock and another dummy $HitBorrower$ to identify *hit-borrowers*. The results are reported in Table 10. Relative to other lenders, banks more exposed to the Russia shock reduced their credit supply to *non-hit borrowers* of around 2.6 per cent – in line with the results above and the fact that *non hit-borrowers* are the vast majority of firms – but instead increased their granted credit to *hit-borrowers* by nearly 4 per cent. Interestingly, the credit adjustments for both *hit* and *non hit-borrowers* mainly involved term loans. Moreover,the credit contraction with respect to *non hit-borrowers* occurred across all the main sectors of the economy (Table 11), albeit it was quantitatively more relevant for the manufacturing sector, to which the large majority of the exporters to Russia belonged.

Figure 3 provides further evidence on the dynamics of the credit reallocation between hit and non-hit borrowers undertaken by these banks: before the shock their lending strategies was broadly similar to the one of other lenders, for both hit and non hit-borrowers; afterwards, instead, their credit supply increased for *hit-borrowers* while it gradually decreased for *non hit-borrowers*.

We then move to investigate the economic determinants underlying the different lending patterns across borrowers differently hit by the Russia shock. In particular, we consider whether the adjustments are driven by a bank capital channel, i.e. a bank level re-adjustment of credit across borrowers aimed at reducing the impact of the heightened credit risk on *hit-borrowers'* bank loans. In this respect, *hit-banks* might find relatively more convenient to provide credit to fundamentally *sound hit-borrowers* so as to avoid, at least in the short-term, their default. Indeed, this boils down to providing credit to fundamentally sound firms facing a temporary liquidity shock. The higher the bank exposure to these firms the higher the cost – absent any liquidity support – of their (simultaneous) default in terms of profits and, ultimately, capital. At the same time *hit-banks* have heightened incentives to implement a de-risking strategy, by reducing credit to all borrowers

that were already riskier before the shock.

In support of this narrative, we find that relative to other banks *hit-banks* reduced credit, especially term loans, towards hit and non hit borrowers with a low credit rating before the shock,[7] while they increased lending to sound *hit-borrowers* (Table 12), consistently with an underlying stronger motive to accommodate firms' liquidity needs and reduce the risk it turns into a solvency issue.

We then investigate the extent of heterogeneity within *hit-borrowers*, dividing them in two groups based on their exposure to the Russian market: medium-hit borrowers with a moderate exposure to Russia (exports to Russia between 9 and 30 per cent of total sales) and high-hit borrowers with a high or very high exposure to Russia (exports to Russia between 30 and 100 per cent of total sales). Table 13 shows that the positive credit supply shock only involved medium-hit borrowers, while the coefficient on the interaction with high-hit is not different from zero, thus indicating that the latter firms suffered a negative credit supply shock similar to that of *non-hit borrowers* (the reference category). This is consistent with the interpretation that exposed banks were willing to financially support only the subset of *hit-borrowers* with reasonable prospects of diversification and recovery (i.e. those whose exposure to the Russian market was below high levels of concentration).

6 Robustness checks

In this section we present a series of robustness tests to rule out that our results are driven by alternative mechanisms.

Credit response for hit-borrowers with bank-firm data. The result that *hit-borrowers* did not experience a restriction in their overall availability of credit (Table 6) deserves further analysis. For this purpose, we exploit the granularity of our dataset and explore how credit relations at the bank-firm level changed after the shock. Specifically, we cross-check whether our firm-level results continue to hold in this setup that controls for time-

[7] Riskiness is based on the Cerved score, which is in turn derived on the basis of the Altman (1968) methodology resulting in the classification of firms into 9 increasing risk classes from 1 to 9. In particular, we generated a $RISKIER$ variable which is equal to one if the firm is classified in the vulnerable categories, i.e. risk class between 7 and 9.

invariant firm and bank-firm fixed effects. Indeed, Table 14 shows that *hit-borrowers* did not experience a contraction of the total amount of granted and outstanding credit, and term loans actually increased. These results are consistent with the firm level analysis.

Relationship lending. Next we consider whether our main results may depend on the fact that more exposed banks are also on average more likely to be the main relationship lender (Petersen and Rajan (1994), Berger and Udell (1995)) of *hit-borrowers*, and as such be more likely to accommodate firm idiosyncratic credit demand shocks. We perform two complementary analyses. First, we test whether there exist differential effects, in terms of credit granted, from being the main lender – defined as the bank holding the higher share of borrower's bank credit pre-shock – across different borrowers and banks. Table 15 (columns 1-4) shows that the main lender grants more credit to the borrower before the shock (this is mechanical) and after it; however, the after shock coefficients related to both being a *hit-bank* and its interaction with *hit-borrowers* remain roughly unchanged relative to Table 10. Lastly, we find no differential effect of being a main lender across banks and borrowers differently exposed to the Russia shock.

Yet, it might be that *hit-borrowers* are more likely to have as main lender a *hit-bank*. In other words, all borrowers receive a similar amount of additional loans from their main lender, but *hit-borrowers* are more likely to have *hit-banks* as main lenders. We test this hypothesis through a linear probability model in which the dichotomous variable main lender is regressed on the *hit-borrower* and the *HitBank* variable, further controlling for firm-time and bank-time fixed effects (Table 15, column 5). We find the coefficient of the interaction between these two dummies is not statistically significant.

All in all, both pieces of evidence point out that relationship lending is not a plausible explanation for the divergence in lending behaviour by banks differently affected by the Russia shock.

Bank sectoral and trade finance specialization. We consider as a robustness whether bank specialization in trade finance activities (Crozet and Hinz, 2020) or some economic sectors (Paravisini et al., 2015) alternatively explain the lending patterns observed and in particular the credit reallocation between hit and non-hit borrowers undertaken by the banks more exposed to the Russia shock. However, Table 16 (columns 1 and 2 respec-

tively) show that both the magnitude and statistical significance of coefficients related to $HitBank$ and $HitBank \times HitBorrower$ are roughly unchanged once inserting in the regression model proxies for either type of specialization.

Direct bank exposures to Russia. Our main variable of interest, $HitBank$, only takes into account the indirect exposure of each bank to the Russia shock through their lending to Italian exporters to Russia. However, banks may also hold direct exposures to Russian branches and subsidiaries. These exposures may also potentially affect their lending policies towards Italian firms via the bank capital channel. To rule out the possibility that our results only depend on such direct exposures, rather than from the indirect exposures through hit-borrowers, we run our main specifications excluding from the sample the Italian banks with branches or subsidiaries in Russia.[8] Table 16 (column 3) shows that the results are in line with those of Table 10: banks more exposed to the Russia shock cut lending relatively more to non-hit borrowers, while the opposite credit pattern takes place towards *hit-borrowers*.

Import linkages. The large rouble depreciation in 2014 might have benefited firms and sectors importing inputs from Russia (although only a small share of imports is invoiced in the Russian currency, as a large majority of imports is settled in U.S. dollars and euro). Italy's imports from Russia are highly concentrated in a small number of sectors (mainly natural gas, oil, metals and metal products). We run the baseline specification on credit supply after dropping these sectors and find that our results are confirmed (Table 17, column 1).

Trade in services. The sharp decline in Russian import demand affected not only goods but also services. Specifically, travel expenditures by Russian visitors in Italy (the main component in Italy's exports of services to Russia) fell by about 35 per cent in value terms between 2013 and 2015. Exposure to Russian travellers was heterogeneous across provinces: the share of Russian travellers' expenditure on total foreign traveller's expenditure before the shock was negligible in most provinces but was as high as 40 per cent in selected destinations that were very popular destinations among Russian tourists. We

[8]The two largest Italian banking groups, Intesa Sanpaolo and UniCredit, are the only ones with Russian subsidiaries.

compute a measure of bank exposure to services sectors hit by the Russia shock, as a weighted average of loans to hotels and restaurants, with weights corresponding to the share of Russian travellers' expenditure on total foreign traveller's expenditure in each province. We find that the coefficients on our baseline bank exposure variable are unaffected (Table 17, column 2).

Oil price shock. The steep fall in oil price might affect the activity of Italian firms and sectors not only via the decrease in Russia's import demand but also through other channels; for instance, sectors with a high energy intensity might benefit from cheaper oil prices. We compute a measure of bank exposure to energy-intensive sectors (defined on the basis of energy use per unit of value added). We find that the inclusion of this control does not change our coefficients on baseline bank exposure (Table 17, column 3).

7 Conclusions

This paper uses the dual shocks of sanctions and falling oil prices suffered by Russia in 2014 as an exogenous event that sharply reduced export market opportunities for Italian firms selling to Russia. This allows us to investigate how a trade shock in an export market propagates to the exporting country's banking system, specifically through banks with a loan portfolio disproportionately oriented toward firms exporting to Russia.

We first confirm that firms exporting to Russia displayed a substantial worsening of their performance after the shock, in terms of lower revenues and higher financial vulnerability. Credit demand increased, especially for loan instruments such as credit lines that are better suited to cope with liquidity needs. Banks that were relatively more exposed to Italian exporters to Russia cut their overall credit supply, including *vis-à-vis* borrowers that were not directly hit by the Russia shock (especially riskier firms). At the same time, exposed banks expanded credit towards financially sound firms hit by the Russia shock (especially those with a moderate exposure to the Russian market), in an attempt to accommodate their liquidity needs and prevent a generalized solvency crisis that may have a non-negligible impact on their capital position. The empirical evidence is consistent with the bank capital channel, namely banks more severely hit by the surge in credit risk

due to the Russia shock attempted to reduce their exposures towards previously risky firms; at the same time, these banks had higher incentives to provide credit to firms that were significantly exposed to the Russia shock *and* had a sound credit standing before it.

Overall, our findings suggest that events that lead to a sudden drop in firm revenues, such as the Russia shock, might not only have an impact on firms that are directly hit by the shock, but may also propagate to the rest of the economy through the financial sector, as more exposed banks adjust their loan portfolio including *vis-à-vis* non-hit firms. The evidence is to a large extent consistent with the results reported by Federico et al. (2019), who analyze banks' reaction to an import competition shock rather than export demand shock.

An implication of our work is that the transmission of trade shocks to the financial sector does not necessarily have to pass through global banks. Local or regional banks that are specialized in lending to companies that are hit by a trade shock – as often occurs because of agglomeration economies, geographical advantages or specialization in bank lending – might act as a propagation channel for the rest of the economy. The overall magnitude of these effects obviously depend on the size of the trade shock, which was relatively moderate in our case study, given the widely diversified structure of Italian exports. Our findings pointing to a shock propagation via banks suggest however that the financial system might be less able to absorb trade shocks of a much larger magnitude.

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8 Tables and figures

Table 1: **Summary statistics**

This table reports summary statistics on the main variables used in the econometric analysis. All the variables are further broken down by hit and non-hit borrowers in Table 2 and are described in Table 3.

			Percentiles			Standard
	Count	Mean	25th	50th	75th	deviation
Bank-firm level						
Log credit granted	3549114	12.6300	11.6082	12.5062	13.4863	1.4172
Log credit lines granted	3140224	12.1757	11.2898	12.1548	13.0170	1.3605
Log term loans granted	2197159	12.0939	10.9427	12.0383	13.1759	1.7654
Log credit granted for exports	350082	11.7732	10.8198	11.9184	12.9408	2.0614
Log credit outstanding	3464014	12.0483	11.0509	12.0198	13.0656	1.7256
Log credit lines outstanding	2922333	11.2927	10.5366	11.4794	12.4148	1.9371
Log term loans outstanding	2008541	11.9738	10.8374	11.9184	13.0949	1.8096
Log credit outstanding for exports	281762	11.7454	10.7014	11.7596	12.8213	1.6357
Share of collateralized loans	3549114	0.1192	0.0000	0.0000	0.0000	0.2901
Share of bad debts in total borrowing	3464014	0.0004	0.0000	0.0000	0.0000	0.0172
Share of other NPL in total borrowing	3464014	0.0654	0.0000	0.0000	0.0000	0.2429
Firm level						
Hit borrower (0/1)	3549114	0.0116	0.0000	0.0000	0.0000	0.1071
Firm log sales	3549114	7.9187	6.8101	7.8054	8.9452	1.6906
Firm log exports	1644076	5.4483	3.38506	5.9715	7.8914	3.3608
Firm log assets	3378697	8.0955	7.0012	7.9413	9.0234	1.5352
Riskier firm (0/1)	3549114	0.2962	0.0000	0.0000	1.0000	0.4566
Firm leverage	3373167	12.9905	3.2200	6.0100	12.7900	25.4918
Firm liquid ratio	3171294	0.0458	0.0040	0.0167	0.0538	0.0750
Bank level						
Hit bank (0/1)	3549114	0.0155	0.0000	0.0000	0.0000	0.1238
Bank log assets	3549114	11.6163	10.7063	11.7039	13.2253	1.7290
Bank Capital / Assets	3549114	0.0860	0.0211	0.0857	0.1421	0.0613
NPL ratio	3549114	0.1656	0.1362	0.1503	0.1988	0.0613
Loan-to-deposits ratio	3549114	1.4335	1.2822	1.4525	1.6015	0.2541
Share of govt securities	3549114	0.1328	0.1074	0.1232	0.1425	0.0540

Table 2: **Summary statistics for hit and non-hit borrowers**

This table reports summary statistics on the main variables used in the econometric analysis with the breakdown by hit and non-hit borrowers where the former are identified as those being in the last decile of the distribution of the average share of exports to Russia in total sales in the three years preceding the shock (2011-2013). The underlying threshold is 9 per cent, i.e. firms having a share of exports to Russia greater than 9 per cent of their sales are those hit by the shock. All the variables are described in Table 3.

			Percentiles			Standard
	Count	Mean	25th	50th	75th	deviation
Non-hit borrowers						
Log credit granted	3507922	12.6250	11.6069	12.5014	13.4765	1.4171
Log credit lines granted	3101877	12.1710	11.2898	12.1281	13.0058	1.3599
Log term loans granted	2168952	12.0903	10.9376	12.0319	13.1712	1.7655
Log credit granted for exports	330456	11.7546	10.8198	11.9184	12.9239	2.0774
Log credit outstanding	3424064	12.0454	11.0475	12.0151	13.0608	1.7237
Log credit lines outstanding	2888446	11.2899	10.5341	11.4758	12.4102	1.9347
Log term loans outstanding	1983696	11.9711	10.8344	11.9184	13.0918	1.8103
Log credit outstanding for exports	265329	11.7307	10.6777	11.7409	12.8080	1.6450
Share of collateralized loans	3507922	0.1198	0.0000	0.0000	0.0000	0.2908
Share of bad debts in total borrowing	3424064	0.0004	0.0000	0.0000	0.0000	0.0173
Share of other NPL in total borrowing	3424064	0.0656	0.0000	0.0000	0.0000	0.2432
Hit borrower (0/1)	3507922	0.0000	0.0000	0.0000	0.0000	0.0000
Hit bank (0/1)	3507922	0.0153	0.0000	0.0000	0.0000	0.1229
Firm log sales	3507922	7.9102	6.8012	7.7948	8.9352	1.6916
Firm log exports	1602163	5.3881	3.3082	5.9030	7.8390	3.3654
Firm log assets	3338119	8.0887	6.9949	7.9331	9.0148	1.5353
Riskier firm (0/1)	3507922	0.2965	0.0000	0.0000	1.0000	0.4567
Firm leverage	3332599	13.0609	3.2200	6.0300	12.8300	25.8413
Firm liquid ratio	3132255	0.0456	0.0039	0.0166	0.0535	0.0748
Bank log assets	3507922	11.6160	10.7063	11.7039	13.2253	1.7292
Bank Capital / Assets	3507922	0.0861	0.0211	0.0857	0.1421	0.0613
NPL ratio	3507922	0.1655	0.1362	0.1503	0.1988	0.0613
Loan-to-deposits ratio	3507922	1.4333	1.2822	1.4525	1.6015	0.2541
Share of govt securities	3507922	0.1328	0.1079	0.1232	0.1425	0.0540
Hit borrowers						
Log credit granted	41192	13.0588	12.1948	13.0170	13.9117	1.3615
Log credit lines granted	38347	12.5604	11.7069	12.6080	13.3847	1.3534
Log term loans granted	28207	12.3721	11.3480	12.3910	13.4832	1.7371
Log credit granted for exports	19626	12.0857	11.2898	12.2061	13.1224	1.7409
Log credit outstanding	39950	12.2930	11.3856	12.4006	13.4272	1.8661
Log credit lines outstanding	33887	11.5383	10.7890	11.8534	12.8125	2.1241
Log term loans outstanding	24845	12.1933	11.1563	12.2061	13.2868	1.7383
Log credit outstanding for exports	16433	11.9830	11.0265	11.9829	12.9715	1.4578
Hit borrower (0/1)	41192	1.0000	1.0000	1.0000	1.0000	0.0000
Hit bank (0/1)	41192	0.0359	0.0000	0.0000	0.0000	0.1859
Firm log sales	41192	8.6140	7.6449	8.5924	9.5992	1.4518
Firm log exports	41192	7.7487	6.6882	7.9544	9.2351	2.1605
Firm log assets	40578	8.6507	7.6138	8.5526	9.5787	1.4198
Riskier firm (0/1)	41192	0.2650	0.0000	0.0000	1.0000	0.4413
Firm leverage	40568	7.2057	3.0300	5.0900	10.0100	9.9087
Firm liquid ratio	39039	0.0636	0.0070	0.0272	0.0790	0.0930
Bank log assets	41192	11.6385	10.7840	11.7039	13.2253	1.7197
Bank Capital / Assets	41192	0.0857	0.0000	0.0858	0.1421	0.0615
NPL ratio	41192	0.1695	0.1381	0.1529	0.1988	0.0655
Loan-to-deposits ratio	41192	1.4505	1.2902	1.4741	1.6015	0.2537
Share of govt securities	41192	0.1289	0.1063	0.1213	0.1344	0.0527
Share of collateralized loans	41192	0.0720	0.0000	0.0000	0.0000	0.2172
Share of bad debts in total borrowing	39950	0.0003	0.0000	0.0000	0.0000	0.0124
Share of other NPL in total borrowing	39950	0.0492	0.0000	0.0000	0.0000	0.2121

Table 3: **Description of the variables**

This table reports the description of the variables used in the econometric analysis and their sources. Summary statistics on all the variables and their break down by hit and non-hit borrowers are provided in, respectively, Table 1 and Table 2.

Variable	Description	Source
Bank-firm level		
Credit granted	Credit granted by banks to non-financial corporations	Credit register
Credit outstanding	Credit outstanding, i.e. the amount effectively drawn by the borrower	
Share of collateralized loans	Share of collateralized loans in total loans granted by the bank to the firm	
Share of bad debts in total borrowing	Share of bad debts in total loans granted by the bank to the firm	
Share of other NPLs in total borrowing	Share of other non performing loans in total loans granted by the bank to the firm	
Main lender	Indicator variable equal to one if the bank is the lender with the largest amount of credit to the firm and zero otherwise	
Firm level		
Hit borrower	Indicator variable equal to one if the firm lies in the last decile of the distribution of the share of exports to Russia in total sales in the three years preceding the Russia shock (2011-2013)	Customs and Monopolies Agency (CMA)
Log exports	Logarithm of firm exports	
Log sales	Logarithm of firm sales	Cerved
Log assets	Logarithm of firm assets	
Riskier firm	Indicator variable equal to one if the firm is classified as vulnerable according to the Cerved score based on the Altman methodology	
Leverage	Assets-to-equity ratio	
Liquid ratio	Share of deposits and other liquid assets in total assets of firms	
Lenders exposure	Average exposure of banks lending to the firm, which is calculated as the average bank exposure weighted for the share of the lending bank in firm's total borrowing.	Credit register and CMA
Bank level		
Bank exposure	Weighted average of the share of exports to Russia in total sales of firms borrowing from the bank in the three years preceding the Russia shock (2011-2013; weights are based on the share of the borrowing firm in bank loan portfolio)	Credit register and CMA
Hit bank	Indicator variable equal to one if the bank lies in the last decile of the distribution of bank exposure	
Log assets	Logarithm of bank assets	Bank supervision statistics
Capital / Assets	Ratio of capital and reserves to (unweighted) assets	
NPL ratio	Share of non performing loans in total loans	
Loan-to-deposits ratio	Ratio of loans to non-financial corporations and households to retail deposits	
Share of govt securities	Share of government debt securities holdings in total assets	

Figure 1: **Banks' Exposure to the Russia Shock**

This figure depicts the kernel density estimation of the distribution of the exposure of Italian banks to the Russia shock of 2014. The method of calculation of the variable is illustrated in Table 3.

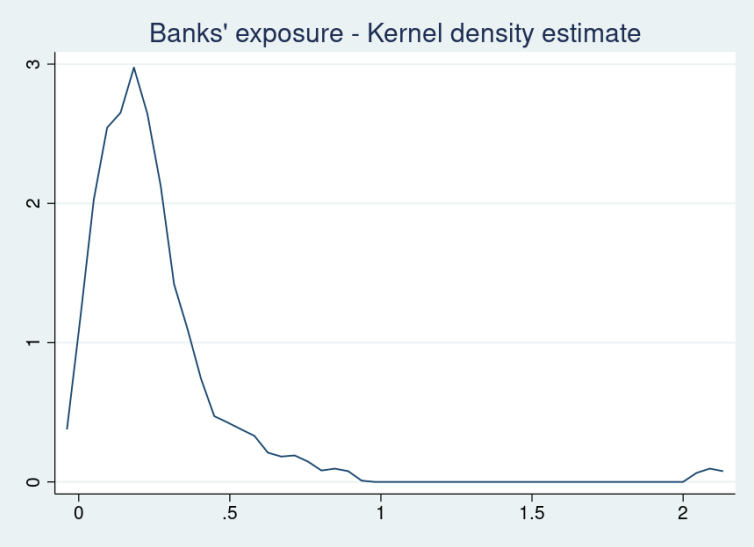


Table 4: **Firms' post-shock outcomes**

This table reports the estimation results of a linear fixed effects model on a cross-section of firms. In the first three models the outcome variables are the change in log sales, leverage and liquid ratio between the average of the two-year pre-shock period and the value in 2016. The last two models are linear probability models with a dichotomous outcome variable equal to one if the firm is reported as having bad debts or other non performing loans in the Credit Register at the end of 2016. The main explanatory variable is $HITBORROWER$, an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013). All the specifications include fixed effects at province and sector level and a set of firm controls. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1)	(2)	(3)	(4)	(5)
	Δ Sales	Δ Leverage	Δ Liquid ratio	Bad debt	Other NPL
HITBORROWER	-0.1667***	3.5221***	-0.0119***	0.0190***	0.0176***
	(0.0445)	(1.1099)	(0.0035)	(0.0047)	(0.0066)
Firm controls	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes
N	305312	316971	299810	346335	346335
adj. R^2	0.063	0.087	0.019	0.046	0.069

Table 5: **Firms' post-shock domestic sales and exports**

This table reports the estimation results of a linear fixed effects model on a cross-section of firms. The outcome variables in columns (1)-(2) are the change in domestic sales and in total exports at the firm level, respectively. The outcome variable in columns (3)-(5) are the change in exports to all countries, to Russia and to other countries by firm, product and country. The outcome variables are defined as the change between the average of the two-year pre-shock period and the value in 2016. The main explanatory variable is $HITBORROWER$, an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013). All the specifications include fixed effects at province and sector level and a set of firm controls. Columns (3)-(5) also include product-country fixed effects. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Δ Domestic Sales (firm)	(2) Δ Exports (firm)	(3) Δ Exports (firm-product-ctry)	(4) Δ Exports to Russia (firm-product)	(5) Δ Exports to other countries (firm-product-ctry)
HITBORROWER	-0.0812*	-0.4131***	-0.0713***	-0.1940***	-0.0607***
	(0.0444)	(0.0572)	(0.0066)	(0.0293)	(0.0068)
Firm controls	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes
Product FE				Yes	
Product-Country FE			Yes		Yes
N	61925	61920	1354402	30733	1323669
adj. R^2	0.021	0.009	0.124	0.099	0.124

Figure 2: **Effects of the shock on credit supply over time**

This figure depicts the point estimate and the 95 per cent confidence interval of the coefficients of the linear regression of the logarithm of credit granted by banks to non-financial corporations on the interaction between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3) and the time dummies for the five quarters preceding and following the Russia shock in the third quarter of 2014. Such specification corresponds to the one whose results are reported in Table 8 with the $POST$ variable being replaced by a vector of time dummies.

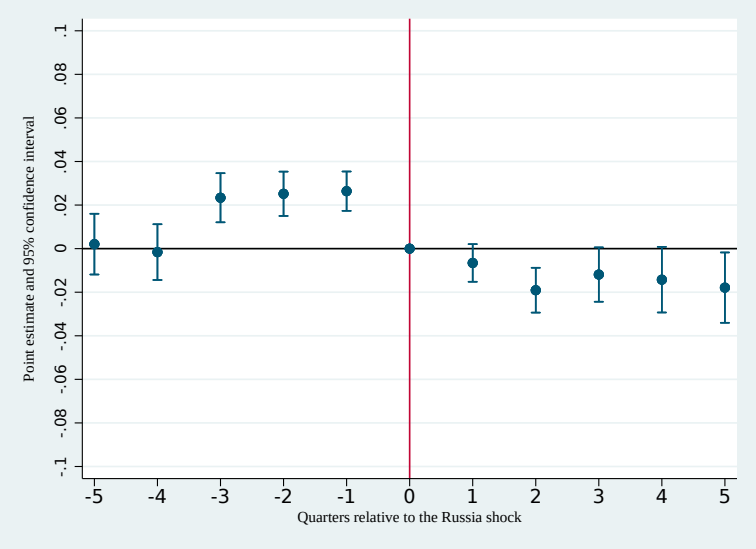


Table 6: **Firms' Borrowing**

This table reports the estimation results of a panel linear fixed effects model where the outcome variable is the logarithm of the overall stock of credit granted (panel a) and credit outstanding (panel b) by all banks to each non-financial corporation in a time window of one year before and after the Russia shock occuring in the third quarter of 2014. Results are also reported for the loan break down, i.e. credit lines, term loans and loans granted for export purposes (trade finance). The main explanatory variable is the interaction between $HITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)) and $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before). All the specifications include firm, sector x time and province x time fixed effects. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

(a) Credit granted				
	(1)	(2)	(3)	(4)
	Total loans	Credit Lines	Term Loans	Trade finance
POST x HITBORROWER	0.0160	0.0082	0.0252	0.0027
	(0.0104)	(0.0119)	(0.0153)	(0.0295)
Firm time-varying controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Sector x Time FE	Yes	Yes	Yes	Yes
Province x Time FE	Yes	Yes	Yes	Yes
N	2746613	2391331	1987308	208464
adj. R^2	0.963	0.958	0.930	0.880
(b) Credit outstanding				
POST x HITBORROWER	0.0744**	0.1255**	0.0547**	0.0133
	(0.0284)	(0.0487)	(0.0183)	(0.0293)
Firm time-varying controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Sector x Time FE	Yes	Yes	Yes	Yes
Province x Time FE	Yes	Yes	Yes	Yes
N	2601962	1995077	1887544	149586
adj. R^2	0.902	0.835	0.923	0.885

Table 7: **Firms' Borrowing and Banks' Exposure**

This table reports the estimation results of a panel linear fixed effects model where the outcome variable is the logarithm of the overall stock of credit granted (panel a) and outstanding (panel b) by all banks to each non-financial corporation in a time window of one year before and after the Russia shock of the third quarter of 2014. Results are also reported for the loan break down, i.e. credit lines and term loan, and for those granted for export purposes (trade finance). The main explanatory variables are: the interaction between $HITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)) and $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before); the interaction between $LENDERS_EXPOSURE$ (average exposure to $HITBORROWER$ of each bank lending to the firm, which is calculated as the average $BANK_EXPOSURE$ (Table 3) weighted for the share of the lending bank in firm's total borrowing) and $POST$; the triple interaction between $LENDERS_EXPOSURE$, $POST$ and $HITBORROWER$. All the specifications include firm, sector x time and province x time fixed effects. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

(a) Credit granted

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance
POST x HITBORROWER	0.0066	0.0098	0.0059	0.0306
	(0.0131)	(0.0149)	(0.0232)	(0.0383)
LENDERS EXPOSURE x POST	-0.0143	-0.0278**	0.0052	-0.0340
	(0.0086)	(0.0099)	(0.0179)	(0.0582)
LENDERS EXPOSURE x POST x HITBORROWER	0.0337	-0.0041	0.0670	-0.0939
	(0.0338)	(0.0345)	(0.0693)	(0.0935)
Firm time-varying controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Sector x Time FE	Yes	Yes	Yes	Yes
Province x Time FE	Yes	Yes	Yes	Yes
N	2730500	2380287	1976784	208254
adj. R^2	0.963	0.957	0.930	0.880

(b) Credit outstanding

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance
POST x HITBORROWER	0.0615*	0.1082*	0.0588**	0.0490
	(0.0281)	(0.0478)	(0.0235)	(0.0415)
LENDERS EXPOSURE x POST	-0.0117	-0.0217	0.0107	0.1086
	(0.0137)	(0.0209)	(0.0196)	(0.0766)
LENDERS EXPOSURE x POST x HITBORROWER	0.0470	0.0620	-0.0148	-0.1317
	(0.0606)	(0.0973)	(0.0608)	(0.0910)
Firm time-varying controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Sector x Time FE	Yes	Yes	Yes	Yes
Province x Time FE	Yes	Yes	Yes	Yes
N	2587470	1987395	1877973	149458
adj. R^2	0.902	0.835	0.923	0.885

Table 8: **Credit supply - Baseline**

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. Results are also reported for the loan break down, i.e. credit lines and term loan, and for those granted for export purposes (trade finance). The main explanatory variable is the interaction between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3) and $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before). All the specifications include bank and bank-firm time-varying controls as reported in Table 1. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1)	(2)	(3)	(4)
	Total loans	Credit Lines	Term Loans	Trade finance
POST x HITBANK	-0.0239***	0.0120**	-0.0969***	-0.0094
	(0.0049)	(0.0052)	(0.0133)	(0.0308)
Bank time-varying controls	Yes	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes	Yes
Firm x time	Yes	Yes	Yes	Yes
N	4211755	3630043	2140602	314702
adj. R^2	0.949	0.926	0.887	0.821

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 9: **Credit Supply - Interactions with bank characteristics**

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. Results are also reported for the loan break down, i.e. credit lines and term loan, and for those granted for export purposes (trade finance). The main explanatory variables are: the interaction between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3) and $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before); the triple interaction between $HITBANK$, $POST$ and selected bank characteristics. All the specifications include further bank and bank-firm time-varying controls as reported in Table 1. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Assets	(2) Capital ratio	(3) NPL ratio	(4) Loans-to-dep. ratio
POST x HITBANK	0.7600***	0.0063	0.0815***	0.0760***
	(0.1257)	(0.0152)	(0.0076)	(0.0157)
POST x ASSETS	0.0020***			
	(0.0003)			
POST x HITBANK x ASSETS	-0.0999***			
	(0.0167)			
POST x CAPITAL RATIO		0.0338		
		(0.0302)		
POST x HITBANK x CAPITAL RATIO		-0.1130		
		(0.1975)		
POST x NPL RATIO			0.1319***	
			(0.0140)	
POST x HITBANK x NPL RATIO			-0.7863***	
			(0.0608)	
POST x LOANS-TO-DEP RATIO				-0.0117***
				(0.0020)
POST x HITBANK x LOANS-TO-DEP				-0.0467***
				(0.0103)
Bank time-varying controls	Yes	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes	Yes
Firm x time	Yes	Yes	Yes	Yes
N	4507618	4507618	4507618	4507618
adj. R^2	0.949	0.949	0.949	0.949

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 10: **Credit supply - Interaction with *hit-borrowers***

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. Results are also reported for the loan break down, i.e. credit lines and term loan, and for those granted for export purposes (trade finance). The main explanatory variables are: the interaction between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3) and $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before); the triple interaction between HIT_BANK, $POST$ and $HITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)). All the specifications include further bank and bank-firm time-varying controls as reported in Table 1. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance
POST x HITBANK	-0.0258***	0.0126**	-0.1031***	-0.0010
	(0.0050)	(0.0052)	(0.0133)	(0.0336)
POST x HITBANK x HITBORROWER	0.0659**	-0.0196	0.1909*	-0.0703
	(0.0336)	(0.0332)	(0.1007)	(0.0732)
Bank time-varying controls	Yes	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes	Yes
Firm x time	Yes	Yes	Yes	Yes
N	4211755	3630043	2140602	314702
adj. R^2	0.949	0.926	0.887	0.821

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 11: **Credit supply - Interaction with non *hit-borrowers* by sector**

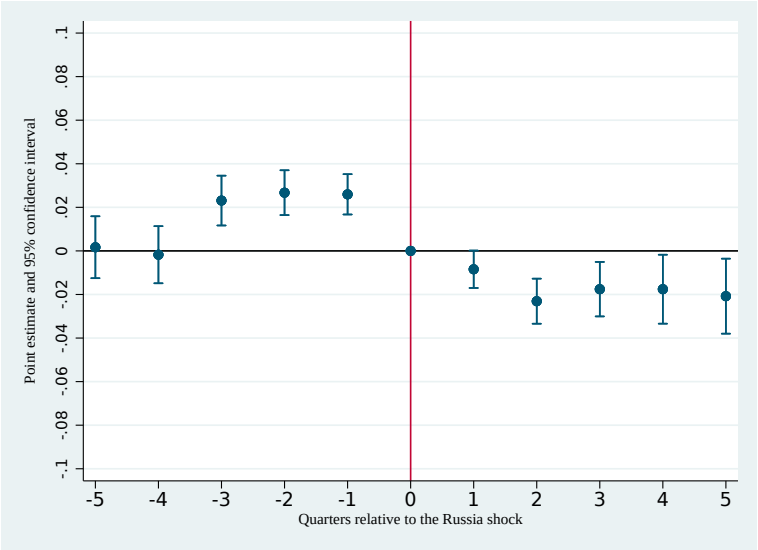
This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. Results are also reported for the loan break down, i.e. credit lines and term loan, and for those granted for export purposes (trade finance). The main explanatory variables are the interactions between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3), $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before) and sector dummies (non-hit manufacturing, non-hit constructions, non-hit services). All the specifications include further bank and bank-firm time-varying controls as reported in Table 1. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance
HITBANK x NON-HIT-MANUFACTURING	-0.2147**	-0.0558	-0.2458*	0.2139
	(0.0966)	(0.0990)	(0.1304)	(0.2771)
HITBANK x NON-HIT-CONSTRUCTIONS	-0.2736*	-0.1947**	-0.0499	0.0000
	(0.1568)	(0.0988)	(0.1295)	(0.0000)
HITBANK x NON-HIT-SERVICES	-0.1331	-0.0656	0.0137	0.0000
	(0.0845)	(0.0970)	(0.0902)	(0.0000)
POST x HITBANK x NON-HIT-MANUFACTURING	-0.0662**	0.0271	-0.2062**	0.0127
	(0.0291)	(0.0297)	(0.0916)	(0.0728)
POST x HITBANK x NON-HIT-CONSTRUCTIONS	-0.0428	0.0071	-0.1492	-0.5020
	(0.0314)	(0.0329)	(0.0976)	(0.3757)
POST x HITBANK x NON-HIT-SERVICES	-0.0496*	0.0131	-0.1648*	0.1561
	(0.0293)	(0.0298)	(0.0921)	(0.1122)
Bank time-varying controls	Yes	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes	Yes
Firm x time	Yes	Yes	Yes	Yes
N	3568027	3058268	1832986	260871
adj. R^2	0.954	0.932	0.894	0.830

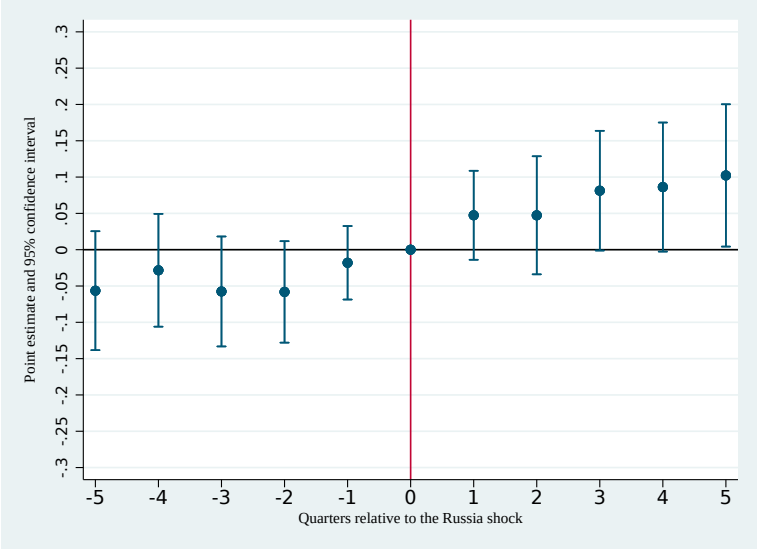
Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Figure 3: **Effects of the Russia shock on credit supply over time**

This figure depicts the point estimate and the 95per cent confidence interval of the coefficients of the linear regression of the logarithm of credit granted by banks t non-financial corporations on the interaction between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3), time dummies for the 5 quarters preceding and following the Russia shock in the third quarter of 2014, and non-hit borrowers dummy (upper panel) / hit-borrowers dummy (lower panel) (based on an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)). Such specification corresponds to the one whose results are reported in Table 10 with the $POST$ variable being replaced by time dummies.



Non *hit-borrowers*



Hit-borrowers

Table 12: **Credit supply - Riskier firms**

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. Results are also reported for the loan break down, i.e. credit lines and term loan, and for those granted for export purposes (trade finance). The main explanatory variables are the interactions between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3), $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before), $HITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)), and $RISKIER$ (equal to one if the firm is classified in the vulnerable categories of the CERVED score (risk class between 7 and 9)). All the specifications include further bank and bank-firm time-varying controls as reported in Table 1. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance
POST x HITBANK	0.0011	0.0302***	-0.0660***	0.0303
	(0.0049)	(0.0051)	(0.0133)	(0.0337)
POST x HITBANK x HITBORROWER	0.0611*	-0.0164	0.2016**	-0.0489
	(0.0329)	(0.0321)	(0.0987)	(0.0723)
POST x HITBANK x RISKIER FIRM	-0.0484**	-0.0039	-0.0556	-0.1485
	(0.0203)	(0.0199)	(0.0571)	(0.1179)
POST x HITBANK x HITBORROWER x RISKIER FIRM	-0.0622	-0.0171	-0.4160**	0.2152
	(0.0925)	(0.0577)	(0.2042)	(0.3215)
Bank time-varying controls	Yes	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes	Yes
Firm x time	Yes	Yes	Yes	Yes
N	4308183	3714552	2220106	323509
adj. R^2	0.949	0.926	0.885	0.821

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 13: **Credit supply - Heterogeneity within *hit-borrowers***

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. The main explanatory variables are $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3), $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before), $MEDIUMHITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies between 9 and 30 per cent in the pre-shock period (2011-2013)) and $HIGHHITBORROWER$ ((an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies between 30 and 100 per cent in the pre-shock period (2011-2013)). All the specifications include further bank and bank-firm time-varying controls as reported in Table 1. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance
POST x HITBANK	-0.0253***	0.012**	-0.1010***	0.0005
	(0.0049)	(0.0052)	(0.0132)	(0.0314)
POST x HITBANK x MEDIUMHITBORROWER	0.0875**	-0.1025	0.2799**	-0.0607
	(0.0449)	(0.0655)	(0.1414)	(0.1091)
POST x HITBANK x HIGHHITBORROWER	0.0002	-0.0269	0.1186	-0.0817
	(0.0466)	(0.0528)	(0.1579)	(0.1227)
Bank time-varying controls	Yes	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes	Yes
Firm x time	Yes	Yes	Yes	Yes
N	4211755	3630043	2140602	314702
adj. R^2	0.949	0.926	0.887	0.823

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 14: **Bank-firm shock response**

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted (panel a) and loans outstanding (panel b) by banks to non-financial corporations. Results are also reported for the loan break down, i.e. credit lines and term loan, and for those granted for export purposes (trade finance). The main explanatory variable is the interaction between $HITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)) and $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before). All the specifications include further firm, bank and bank-firm time-varying controls as reported in Table 1. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

(a) Credit granted

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance
POST x HITBORROWER	0.0095	-0.0161	0.0493**	0.0149
	(0.0088)	(0.0109)	(0.0173)	(0.0175)
Firm time-varying controls	Yes	Yes	Yes	Yes
Bank time-varying controls	Yes	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes	Yes
Bank x firm FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
N	3772619	3379975	2323265	388521
adj. R^2	0.948	0.925	0.886	0.839

(b) Credit outstanding

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance
POST x HITBORROWER	0.0467	0.0601	0.0653**	0.0111
	(0.0264)	(0.0400)	(0.0220)	(0.0168)
Firm time-varying controls	Yes	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes	Yes
Bank x time FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
N	3660667	3054472	2110633	307647
adj. R^2	0.808	0.724	0.875	0.814

Table 15: **Credit supply - Relationship lending**

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. Results are also reported for the loan break down, i.e. credit lines and term loan, and for those granted for export purposes (trade finance). The main explanatory variable in columns (1)-(4) is the interaction between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3), $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before), $HITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)), and $MAIN_LENDER$ (an indicator variable equal to one for the lender with the greater credit exposure towards the borrower). The estimated model in the fifth column is a linear probability model with the indicator variable $MAIN_LENDER$ being the dependent variable. All the specifications include further firm, bank and bank-firm time-varying controls as reported in Table 1.*, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Total loans	(2) Credit Lines	(3) Term Loans	(4) Trade finance	(5) LPM Total
POST x HITBANK	-0.0262***	0.0127**	-0.1036***	0.0006	
	(0.0050)	(0.0052)	(0.0133)	(0.0337)	
POST x HITBANK x HITBORROWER	0.0677**	-0.0189	0.1909*	-0.0732	
	(0.0340)	(0.0335)	(0.1073)	(0.0735)	
MAIN LENDER	0.1121***	0.0894***	0.0714***	0.1010**	
	(0.0047)	(0.0059)	(0.0126)	(0.0472)	
HITBANK x MAIN LENDER	-0.0361	-0.0009	-0.0895	0.5199	
	(0.0373)	(0.0427)	(0.0795)	(0.6327)	
POST x MAIN LENDER	0.0524***	0.0092	0.1175***	-0.0936	
	(0.0052)	(0.0067)	(0.0166)	(0.0614)	
HITBANK x POST x MAIN LENDER	0.0420	-0.0161	0.1781	-0.5760	
	(0.0421)	(0.0447)	(0.1675)	(0.6571)	
HITBORROWER x MAIN LENDER	0.0576	0.0657	0.0885	0.1607	
	(0.0484)	(0.0600)	(0.1002)	(0.1618)	
HITBANK x HITBORROWER x MAIN LENDER	-0.0660	-0.1172	-0.2669	-1.1245**	
	(0.1454)	(0.1024)	(1.2436)	(0.5622)	
POST x HITBORROWER x MAIN LENDER	-0.0765	-0.0653	-0.0843	-0.0412	
	(0.0536)	(0.0957)	(0.1649)	(0.1631)	
HITBANK x POST x HITBORROWER x MAIN LENDER	-0.1015	-0.0614	-0.1005	0.0000	
	(0.0873)	(0.1449)	(0.1634)	(.)	
HITBANK x HITBORROWER					0.0010
					(0.0026)
Bank time-varying controls	Yes	Yes	Yes	Yes	No
Bank-firm time-varying controls	Yes	Yes	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes	Yes	No
Firm x time	Yes	Yes	Yes	Yes	Yes
Bank x time	No	No	No	No	Yes
N	4211755	3630043	2140602	314702	4211755
adj. R^2	0.949	0.926	0.887	0.821	0.096

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 16: **Credit supply - Specialization and Russian affiliates**

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. The main explanatory variable is the interaction interaction between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3), $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before), and $HITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)). All the specifications include bank-firm, firm-time, bank and bank-firm time-varying controls. Column (1) includes controls for bank specialization in trade finance. Column (2) includes controls for bank sector specialization. Column (3) restricts the sample to banks without branches and/or subsidiaries in Russia. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Trade finance spec.	(2) Sector spec.	(3) No affiliates in Russia
POST x HITBANK	-0.0233***	-0.0241***	-0.02814***
	(0.0050)	(0.0049)	(0.0055)
POST x HITBANK x HITBORROWER	0.0695*	0.0670**	0.0550*
	(0.0366)	(0.0337)	(0.0339)
POST x TRADE FINANCE	-0.03157***		
	(0.0060)		
POST x TRADE FINANCE x HITBORROWER	0.01247		
	(0.03208)		
POST x SECTOR SPEC.		-0.0095***	
		(0.0060)	
POST x SECTOR SPEC. x HITBORROWER		0.0080	
		(0.01335)	
Bank time-varying controls	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes
Firm x time	Yes	Yes	Yes
N	4211755	4211755	2426666
adj. R^2	0.949	0.949	0.948

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$

Table 17: **Credit supply - Further robustness checks**

This table reports the estimation results of a linear fixed effects model where the outcome variable is the logarithm of the stock of loans granted by banks to non-financial corporations. The main explanatory variable is the interaction interaction between $HITBANK$ (indicator variable equal to one if the bank lies in the last decile of bank exposure to firms that export to Russia; see definition in Table 3), $POST$ (equal to one in the third quarter of 2014 and in the following quarters and zero before), and $HITBORROWER$ (an indicator variable which is equal to one if the share of exports to Russia in total sales of the firm lies in the last decile of the distribution in the pre-shock period (2011-2013)). All the specifications include bank-firm, firm-time, bank and bank-firm time-varying controls. Column (1) drops sectors with high imports from Russia. Column (2) adds a control for bank exposure to energy-intensive sectors. Column (3) adds a control for bank exposure to Russian tourism. *, ** and *** denote respectively 10 per cent, 5 per cent and 1 per cent significance levels.

	(1) Drop sectors with high imports from Russia	(2) Control for bank exposure to energy-intensive sectors	(3) Control for bank exposure to Russian tourism
POST x HITBANK	-0.0248***	-0.0316***	-0.0287***
	(0.0049)	(0.0051)	(0.0049)
POST x HITBANK x HITBORROWER	0.0655**	0.0657**	0.0667**
	(0.0337)	(0.0336)	(0.0343)
Bank time-varying controls	Yes	Yes	Yes
Bank-firm time-varying controls	Yes	Yes	Yes
Bank x firm	Yes	Yes	Yes
Firm x time	Yes	Yes	Yes
N	4160570	4211755	4211755
adj. R^2	0.949	0.949	0.949

Standard errors in parentheses
* $p < .10$, ** $p < .05$, *** $p < .01$