

Domestic credit, trade finance, and the trade tensions of 2016-18: A prelude to international fragmentation? *

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February 17, 2023

Abstract

This paper exploits the exogenous changes of destination/origin-specific trade uncertainty indexes to investigate the impact of trade uncertainty on banks' credit provision and firms' foreign trade performance. Using transaction-level data of Chilean firms and banks, we show, first, that increases in trade uncertainty induce a bank-firm portfolio reallocation away from small firms towards large firms involved in the global value chain (GVC) and importers. However, bank credit to exporters does not increase when trade uncertainty augments. Our results are consistent with a risk-mitigating channel from banks that grant larger loans to firms that are perceived as relatively less risky under periods of high trade tensions. Second, we find that increasing trade uncertainty dampens export growth through a deterioration of exporters' working capital when exports are mainly financed by trade credit. Instead, exporters have some ability to substitute among destination countries or products if exports are financed by cash. Third, imports grow more under periods of trade uncertainty when financed by cash-in-advance or bank credit.

Keywords: Trade uncertainty, domestic credit provision, trade finance

JEL codes: F36, F65, G21

*We thank useful comments from our colleagues at the IBRN Fragmentation Initiative, Verónica Rappoport, and the attendees at our seminars at Banco Central de Chile and Universidad de Chile. We also thank Francisco Inostroza and Sebastián Ramírez for their excellent research assistance. The views and conclusions presented herein are exclusively those of the author(s) and do not necessarily reflect the position of the Central Bank of Chile or its Board members.

1 Introduction

Since the late 20th and the early 21st century, we have witnessed an increase in the international integration of trade and global finance, with growing interdependencies between them. However, these interconnections have been under pressure starting with the global financial crisis. Further tensions have arisen from trade-policy frictions and the uncertainty associated with threats of increased unilateralism, war, sanctions, and retaliation.¹ Increasing trade uncertainty² may affect the prospects of firms trading with those countries affected by the uncertainty and, consequently, their credit decisions. In reaction to the rise in trade uncertainty, banks may reallocate credit across firms and/or tighten credit conditions to firms by altering the amounts granted, the interest rates, or the maturities. Indeed, a bank's reaction (to trade uncertainty) also depends on whether the bank is heavily exposed to countries exhibiting rising trade uncertainty (through its portfolio of loans) or whether it specializes in certain foreign currencies. Finally, these growing trade uncertainties have been considered by some academics as indications of a more general de-globalization or international fragmentation process (for a discussion, see [Antràs, 2020](#)).

This paper exploits the exogenous changes of destination/origin-specific trade uncertainty indexes to investigate how trade uncertainty affects bank credit and firms' foreign trade operations, emphasizing the interdependencies among trade, bank credit, and trade finance under periods of increasing trade uncertainty. Precisely, we aim to answer the following research questions: First, does trade uncertainty affect bank credit provision; if the answer is yes, does it impact credit provision differently for non-trade and trade firms? Second, how does trade uncertainty affect firms' foreign trade operations? Finally, is the reaction of trade firms to increasing trade uncertainty moderated by how firms finance their international operations? Answering these questions allows us to shed some light on whether the impact of rising trade uncertainty is likely to have limited effects on firms' foreign trade activities or, oppositely, it may result in spillovers to the overall economy, amplifying the initial shocks through the banking sector.

¹ In this regard, the most prominent headlines in the recent past have highlighted tensions between the U.S. and China in general, the U.S. and Mexico with the renegotiation of NAFTA, and the U.K. and the E.U. with the realization of Brexit.

² Trade uncertainty encompasses the three following features: First, a materialization of tariff increases or tightening of non-tariff measures that augment uncertainty. Second, increased uncertainty regarding the future path of tariffs and non-tariff barriers to trade due to policymakers' discussions. And finally, changes in outstanding trade agreements, which leads to further trade uncertainty.

Our case study is Chile, an open emerging-market economy with inflation targeting and a floating exchange rate regime. Chile is a globalized economy, having more than 30 trade agreements involving 70 foreign markets.³ To answer the research questions above, we build a highly disaggregated database combining information from the complete administrative credit registry (we observe all new loans granted by banks to non-financial corporations), banks' balance sheets, and the National Customs (which contains the universe of Chilean exports and imports). Examining an open economy like Chile with our transactional dataset is appealing for several reasons. First, we can exploit Chile's foreign trade diversification structure to disentangle the heterogeneous effects of destination/origin-specific trade uncertainty shocks on firms and banks. These destination/origin-specific trade uncertainty indexes are exogenous from the point of view of Chilean firms and banks.

Second, thanks to the granularity of our customs dataset, we can quantify firms' exposures to increasing trade uncertainty and their reactions in terms of credit behavior and foreign trade operations (including how they finance their foreign trade operations). We measure a firm's exposure to a given destination or origin country by the value of its exports and/or imports to/from that country relative to the total value of its foreign trade. Third, by incorporating the administrative credit registry, we can measure how exposed banks are to country-specific trade uncertainty changes and which banks' features make them more (or less) sensitive to higher trade uncertainty. We account for a bank's exposure to destination/origin-specific trade uncertainty shocks through the importance that a given country (of destination/origin) has for the firms who are in the loan portfolio of that bank. Our time frame extends over the period January 2012 and March 2019. To measure trade uncertainty, we rely on the country-specific trade uncertainty indexes, calculated by [Ahir et al. \(2022\)](#). These indexes have comprehensive coverage in terms of countries and periods.

To begin with, we show that under periods of high trade uncertainty, bank credit reallocates from non-trade firms towards global value chain firms (i.e. firms that have exported and imported to the same given country over the last year) and, to a lesser extent, to importers who trade with firms in countries exhibiting increasing trade uncer-

³ The 70 markets with which Chile has trade agreements represent 88% of the world's GDP. This network of trade agreements has significantly improved market access for Chilean products and exports. As a matter of fact, over 94% of Chilean exports are directed to countries with which Chile has free trade agreements. The main export markets are China, the United States, the European Union, Japan, and Mercosur. In addition, [Figure A.1](#), in the Appendix, exhibits the Chilean exports by sector.

tainty. In contrast, there is no significant impact on the new loans granted to exporters affected by the increasing trade uncertainty (or an improvement in their credit conditions). Furthermore, we document a crowding-out effect from small firms towards larger GVCs and importers that are exposed to growing trade uncertainty.

Intuitively, under periods of high trade uncertainty, trade firms exposed to the trade uncertainty shock may become financially constrained and, as such, may demand more credit. In particular, GVCs have been especially affected by the rise in trade uncertainty over the recent past (2016-2018), as they trade more with the countries exhibiting the largest increases in trade uncertainty, namely China, the U.S., the U.K., and European Union.⁴ However, if banks follow a risk mitigation strategy, when trade uncertainty augments, they would prefer to grant larger loans to firms that are perceived by them as less risky. Our results suggest that these are larger GVCs and importers (compared to exporters).

In the case of GVCs, banks may perceive them as entailing lower risks because GVCs export and import at the same time from a given country; therefore, their balance sheets are likely to be better hedged (since the risk they are exposed to affects simultaneously their assets and liabilities). In regards to importers, banks may perceive them as less risky because trade uncertainty affects them through a reduction in the credit they receive from foreign firms. Importers can hence look for alternative sources of funding for their imports when trade uncertainty augments.⁵ Oppositely, banks may perceive exporters as riskier because they face the risk of not being paid for the products they produce and export, with this risk increasing under periods of high trade uncertainty.⁶ On top of the above, under a risk selection strategy, banks would prefer larger firms

⁴ Indeed, in our sample, these central economies represent, on average, 60.5% of the international trade of the GVCs, well above the 49.5% these countries represented in the case of pure importers and the 39.4% they represent for pure exporters during the period 2012-2019. Interestingly for our analysis, previous studies (Antràs and Chor, 2022; Bernard et al., 2007, 2009; Kasahara and Lapham, 2013) have shown that GVCs are larger and more productive than pure exporters or pure importers; they trade a larger share of their outputs and inputs; and they are more likely to trade more intensively with developed economies.

⁵ Consistent with this interpretation, we examine the impact of trade uncertainty on the share of rescheduled credits (due to, for example, a change in the loan conditions because of a deterioration in the credit quality of the borrower) over total loans distinguishing by firm status. Interestingly, we find that the share of rescheduled credits for GVCs and importers does not increase when trade uncertainty augments. Results are available from the authors upon request.

⁶ The baseline estimates use the new loans granted by a given bank to a firm f at period t and include sector-time and bank-time fixed effects. Following Paravisini et al. (2017), we interpret the bank credit estimates as bank-firm equilibrium credit outcomes. Nevertheless, as a robustness check, we rely on the Banking Credit Survey and estimate seemingly unrelated regression equations to disentangle whether the significant impacts we find on credit outcomes when trade uncertainty rises are the reflection of changes in the aggregate supply and/or demand for credit or rather, they are due to a reallocation of credit among firms. Results show that trade uncertainty does not significantly affect the aggregate credit supply and/or demand conditions, thus providing support to the reallocation interpretation.

as these firms would be better prepared to handle negative shocks, such as increases in trade uncertainty, compared to smaller firms. Indeed, the crowding-out effect we document (in favor of larger GVCs and importers) is consistent with such a risk selection strategy from banks.

Next, we examine whether some banks' business model traits influence the willingness (or ability) of banks to provide more credit under periods of higher trade uncertainty. We show two novel results. On the one hand, we find that banks whose portfolios of loans are specialized in countries exhibiting rising trade uncertainty react to the trade uncertainty shock by granting smaller loans with larger interest rates to their clients. On the other hand, we show that larger and riskier banks, as well as banks with a larger share of liabilities in foreign currency and foreign banks with strong linkages with their headquarters, are the ones providing more credit when trade uncertainty augments. Intuitively, these banks do not need to limit credit provision under periods of increasing trade uncertainty as they presumably have access to alternative funding sources or they may be willing to bear more risk when trade uncertainty increases (in the case of the riskier banks).

Finally, when investigating the impact of trade uncertainty on firms' foreign-trade operations, we find a dissimilar pattern for exports and imports. Precisely, in the case of exports, we find that trade uncertainty dampens Chilean exports when they are mainly financed by trade credit. These results are consistent with a working capital channel: Trade uncertainty deteriorates the financial conditions of the importers of Chilean products, thus being less willing (or unable) to pay for their imports with cash. Likewise, Chilean exporters may prefer to export less to countries with increasing trade uncertainty when the exports are financed by trade credit (note that with trade credit, the importer receives credit from the exporter, while with cash-in-advance, the importer finances the exporter). These effects combined, Chilean exporters' working capital worsens, which in turn damages export growth. Note that trade credit is the main financing mode of Chilean exports, accounting for more than 80% of total exports. In addition, we find that when exports are mainly financed by cash, Chilean exporters have some ability to substitute across destination countries and/or products when trade uncertainty augments.

In relation to the impact of trade uncertainty on import growth, we show an opposite pattern, as we find that imports grow more if they are mainly financed by cash-in-advance or by bank credit. Intuitively, to mitigate the negative effect of increasing trade uncertainty in a given foreign country (on firms' imports), Chilean importers are more likely to prepay their imports (through cash-in-advance) or to rely more inten-

sively on bank credit to finance their imports. On top of the above, bank credit offers Chilean firms some flexibility to substitute among countries of origin when trade uncertainty augments. This way, banks contribute to limiting the possible spillover effects of increasing trade uncertainty on the external sector and the real economy.

Wrapping up, this paper documents the significant interdependencies between bank credit and trade finance under periods of increasing trade uncertainty. Indeed, we show that increasing trade uncertainty leads to a reallocation of credit towards larger firms that are presumably perceived by banks as less risky. Moreover, we find that higher trade uncertainty in the destination countries negatively affects exports, possibly through the working capital channel. In the case of imports, they grow more with the origin-specific trade uncertainty indexes when imports are financed by cash-in-advance or bank credit. Hence, this indicates that Chilean importers (partially assisted by banks) are indeed financing foreign firms exposed to the increasing trade uncertainty in their own countries.

We conclude that while the trade tensions observed during 2016-2018 resulted in a reallocation of domestic credit, our results do not support the hypothesis of increasing international fragmentation due to growing trade uncertainty, at least for an open emerging-market economy like Chile. Taking a longer historical perspective, [Antràs \(2020\)](#) arrives at a similar conclusion when arguing that there is no conclusive evidence that the world economy is significantly less global than it was at the onset of the 2007-2009 Great Recession. Nonetheless, the arguments above do not mean that further increases in trade uncertainty (for example, due to the implementation of policies that stall liberalization and encourage protectionism) cannot contribute to a de-globalization trend in the future.

This paper is linked to two strands of literature. On the one hand, there is the literature investigating the impact of financial shocks and financial frictions on foreign trade performance ([Manova, 2013](#); [Manova et al., 2015](#)), banks' credit provision ([Paravisini et al., 2017](#)), and trade finance ([Niepmann and Schmidt-Eisenlohr, 2017a,b](#); [García et al., 2019](#); [Costello, 2020](#); [Antràs and Foley, 2015](#); [Schmidt-Eisenlohr, 2013](#)). We add to this literature by studying the impact of trade uncertainty shocks that originate in the real sector on credit outcomes and foreign trade operations. To our knowledge, no previous study has documented the impact of increasing trade uncertainty on credit outcomes. Our result that increasing trade uncertainty leads to a reallocation of credit is consistent with a risk-mitigating channel and with a selection strategy from banks, who

may perceive large GVCs and importers as less risky and better prepared to deal with periods of trade uncertainty (compared to exporters and non-trade firms). Furthermore, we provide evidence of the significant interlinkages between credit provision and trade finance during periods of increasing trade uncertainty.

On the other hand, our paper connects with the literature on the effects of trade uncertainty on firms' performance. As some references in this literature, [Graziano et al. \(2021\)](#) study the effect of Brexit performance on U.K. firms. In turn, [Handley and Limão \(2017, 2015\)](#) investigate the impact of the trade uncertainty arising from the access of China to the WTO on U.S. imports from China. In addition, [Fajgelbaum et al. \(2022\)](#) examine the trade wars between the U.S. and China in 2018, which have led to large declines in U.S. exports and imports, with incomplete pass-through to prices. We add to this literature by showing that firms' reactions to increasing trade uncertainty in a foreign market depend on how exports (or imports) are financed. As an illustration, we document that Chilean exporters are not likely to substitute among destination countries and/or products under periods of trade uncertainty when exports are mainly financed by trade finance, a payment mode which involves long term lending relations.

This paper is structured as follows: Section 2 documents some stylized facts on trade uncertainty and foreign trade performance. In turn, Section 3 presents the data, whereas Section 4 introduces the methodology we rely on in this paper. Section 5 exhibits the model estimates: first, it shows the baseline model specification estimates examining the impact of trade uncertainty on credit outcomes; second, it assesses whether trade uncertainty affects differently the credit outcomes of firms depending on their characteristics; third, it examines the role of banks' business model traits in providing credit under periods of high trade uncertainty; finally, it investigates the influence of trade uncertainty on firms' foreign trade performance, including the way foreign trade is financed. Finally, Section 6 concludes with a discussion of the main findings of the paper. Additional analyses are relegated to the Appendix.

2 Stylized facts on trade uncertainty and foreign trade

To measure the evolution of trade uncertainty across countries, we rely on the country-specific trade uncertainty indexes, hereafter TUI, calculated by [Ahir et al. \(2022\)](#). These indexes count the number of times the word uncertainty (and its variants) is mentioned in proximity to terms related to trade in the EIU country report.⁷ Therefore, the indexes capture not only actual changes in tariffs and non-tariff measures but also the uncertainty arising from threats in tariff and non-tariff changes. While one could argue that actual changes in tariffs are the most important determinants of behavior, a growing literature highlights the importance of policy uncertainty as a driver of economic outcomes ([Attig et al., 2021](#); [Xu, 2020](#); [Bordo et al., 2016](#); [Gulen and Ion, 2016](#); [Julio and Yook, 2012](#)).

One initial question to assess is whether the TUI is effectively measuring trade uncertainty or, rather, it is influenced by other economic factors, such as economic policy uncertainty (EPU) or exchange rates. To address this point, [Figures A.3 to A.6](#), in the Appendix, compare the evolution of the country-specific TUI for the U.S, China, the E.U., and the U.K. with the evolution of the EPU of the corresponding country. The figures make clear that TUI and EPU exhibit different time patterns. We hence conclude that the TUI has specific informational content, thus providing support to the analyses to come.

[Figure 1](#) shows an upward trend in trade uncertainty starting in 2016, which is mainly explained by the growing trade tensions between the United States and China, and the United Kingdom with the European Union.⁸ Importantly, these are countries or regions central to world trade. Although having periods of elevated trade uncertainty is not a new phenomenon (e.g., Argentina in 2011 and 2015; Turkey, from the end of 2015 to 2016; for references, please refer to [Figure A.2](#), in the Appendix), what is new is that, since 2016, these central regions (from the point of view of world trade) have become, on average, more uncertain than the rest of the world. This first stylized fact is one of the motivations of the present work.

⁷ The most common indexes used in the literature rely on text-searching related words in newspapers and other mass media and firm statement reports. These indexes are usually regarded as good indicators of trade policy uncertainty, but they have the shortcoming of being tailored to a single country. Hence, cross-country comparisons are unfeasible.

⁸ The focus on international trade policies started with the 2016 U.S. election and the trade policy proposed by Donald Trump, culminating in trade tensions between U.S. and China. Simultaneously, Brexit brought this issue to the European Union.

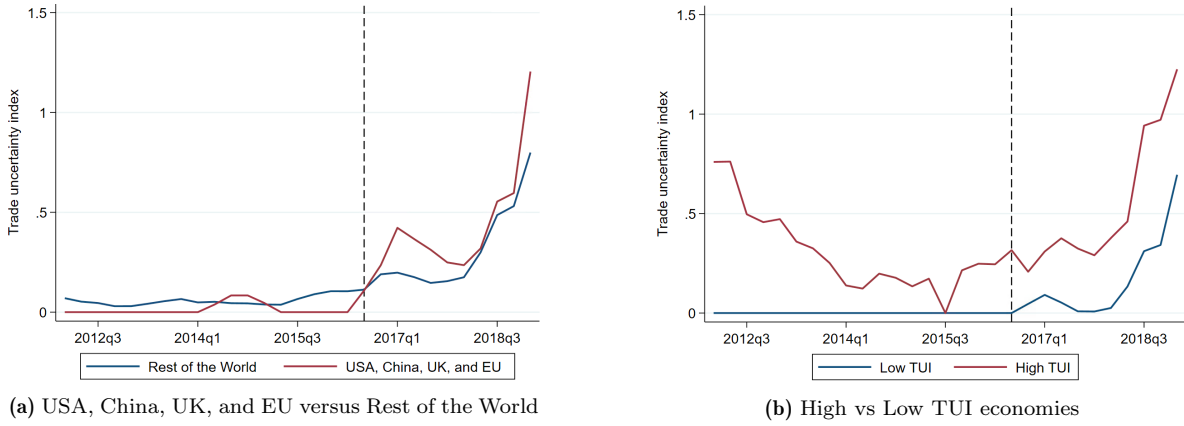


Figure 1: Evolution of the mean trade uncertainty index for different groups of countries. The index is re-scaled to the logarithm of the index plus one. High (low) TUI refers to countries whose trade uncertainty index is above (below) the 90th percentile of the distribution of trade uncertainty indexes for each quarter. The indexes for high and low TUI are scaled such that the minimum value equals zero.

Inspecting the relation between trade uncertainty and Chilean exports, Figure 2 shows that before the third quarter of 2016, the average growth rate of Chilean exports to economies with high TUI (such as the U.S., China, the European Union, and the U.K.) was similar to the export growth to economies with low TUI. Afterward, the evolution of the growth rates of exports to these two groups of countries diverges. Indeed, Chilean exports to high TUI economies have grown slower than exports to low TUI economies. There are two possible explanations for this pattern: i) that there has been export substitution among destination countries or ii) that elevated trade uncertainty has indeed dampened export growth. In the forthcoming Section 5.2, we examine in more detail these aspects.

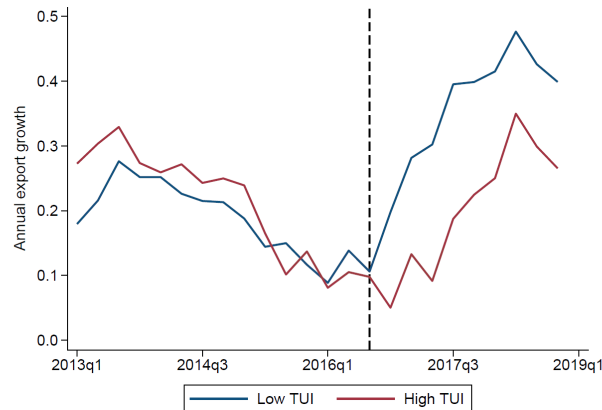


Figure 2: Average export growth of Chilean firms to high and low trade uncertainty economies. Average export growth rates are winsorized at 1% and weighted by the export value.

On the side of imports, Figure 3 depicts, in contrast, that the average growth rate of Chilean imports from high TUI economies has always been smaller than the import growth from low TUI economies. However, this difference has narrowed down after the third quarter of 2016. This indicates that import growth from high TUI countries may not have diminished due to increasing trade uncertainty.

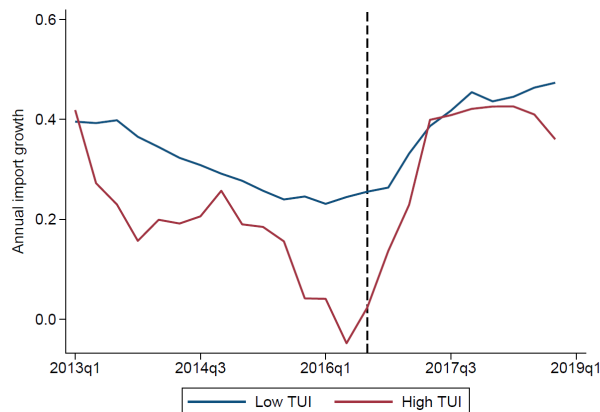


Figure 3: Average import growth of Chilean firms from high and low trade uncertainty economies. Average export growth rates are winsorized at 1% and weighted by the export value.

The evidence above suggests that the impact of trade uncertainty on exporters and importers may differ. Therefore, examining firms’ exposure to destination/origin countries with high or low trade uncertainty is vital to understanding the dynamics of firms’ foreign trade activities, their credit behavior, and the spillover effects that trade uncertainty may generate for the rest of the economy.

3 Data

In this section, we explain the data sources used in this paper.

3.1 Loan registry

Our first dataset is an administrative and confidential dataset from the Financial Markets Commission that registers the universe of loans granted to non-financial corporations from January 2012 to March 2019. This database includes the firm and bank identifiers, the date of origination, the loan amount (in Chilean pesos), the currency, the annualized interest rate charged (on a 360-day basis), the type of interest rate (fixed or variable, and if the latter, the interest rate basis and the frequency of the adjustments), the term of the contract (in months), the type of loan, and whether it is related to a development (collateralized) instrument.

The loan amounts in our dataset correspond to the sum of the credit amounts granted by bank b to firm f in quarter t , hereafter ℓ_{fbt} . The firm-bank-quarter interest rates r_{fbt} and terms τ_{fbt} are averages, weighted by the loan amounts.

For the analysis, we can distinguish among the following loan categories: (i) total loans, (ii) commercial loans excluding development loans (including installment loans, factoring, letters of credit, mutual mortgages for general purposes, repurchase operations, and other credit) (iii) foreign-trade loans, and (iv) development loans, which are collateralized loans by a (public) development agency. The weighted-average interest rates and contractual terms are calculated for each loan category.

Finally, the sector classification of the firms in our administrative dataset is based on the National Accounts' Classification of Activities, which comprises 160 categories. We exclude firms that operate in the financial and housing sectors and non-private firms from the analysis.

3.2 Banks' balance sheet data

As for banks' balance-sheet characteristics, we follow the banking literature (Dell'Ariceia et al., 2017; Morais et al., 2019; Jiménez et al., 2012) and consider information on assets, liquidity, balance sheet quality (as measured by the share of non-performing loans or NPL), and capitalization. These bank balance sheet characteristics are known to influence credit supply and are commonly used in the literature.

In addition, to examine the influence of certain banks' business model traits on credit provision under periods of trade uncertainty, we also include the share of liabilities in foreign currency, whether the bank is foreign-owned, and the intensity of linkages between a resident bank in Chile with its headquarters located overseas (proxied by the gross cross-border positions with the headquarter in the country c). These data come from an administrative and confidential database from the Financial Market Commission.

3.3 Customs data

Our third data source is the Chilean National Customs Data, an administrative and confidential database that provides transaction-level data for Chilean exports and imports. The data is available for the 140 destinations of Chilean exports and the 138 countries from which Chilean firms import goods and services over our sample period. It is released monthly.

For each export or import transaction, the dataset details the identity of the exporter/importer, the country of origin/destination, the product description including the 8-digit Harmonized System code to which the product belongs, the transaction date, the freight-on-board value and volume of the merchandise, and the financing mode of the export transaction. The data allow us to identify if each transaction was paid in advance (cash in advance or CIA), post-shipment (trade credit, hereafter TC), or with financial institutions (such as letters of credit or two-part contracts, hereafter BC). [B.4](#)

3.4 Trade uncertainty indexes

Trade uncertainty indexes come from [Ahir et al. \(2022\)](#). They are constructed by counting the number of times uncertainty (and its variants) is mentioned in proximity to a word related to trade in the Economist Intelligence Unit (EIU) country reports. The indexes are equally weighted averages, and they are scaled by the total number of words in the EIU country reports and multiplied by 100,000. In this study, we focus on trade uncertainty as encompassing both, that is, tensions generated by changes in trade tariffs and non-tariff measures, as well as those driven by the uncertainty regarding the future evolution of trade linkages among countries.⁹ [Tables B.2 and B.2](#), in the Appendix, exhibit the descriptive statistics of the data we consider in this paper. In addition, [Table B.3](#), also in the Appendix, reports the share of trade financed by each payment type.

4 Methodology

4.1 The effect of trade uncertainty on credit

4.1.1 Baseline model specification

To examine whether trade uncertainty affects credit supply and demand decisions, we estimate the following baseline model specifications with stacked observations (to be detailed):

$$\ell_{fbt} = \alpha_{st} + \alpha_{bt} + \alpha_{fbc} + \beta TUI_{ct} + \gamma S_{ft}^c + \delta S_{ft}^c \times TUI_{ct} + \varepsilon_{fbct} \quad (1)$$

$$r_{fbt} = \alpha_{st} + \alpha_{bt} + \alpha_{fbc} + \beta TUI_{ct} + \gamma S_{ft}^c + \delta S_{ft}^c \times TUI_{ct} + \varepsilon_{fbct} \quad (2)$$

$$\tau_{fbt} = \alpha_{st} + \alpha_{bt} + \alpha_{fbc} + \beta TUI_{ct} + \gamma S_{ft}^c + \delta S_{ft}^c \times TUI_{ct} + \varepsilon_{fbct} \quad (3)$$

⁹ Another advantage of the trade uncertainty indexes by [Ahir et al. \(2022\)](#) is that they cover 143 countries. In contrast, trade-policy uncertainty indexes usually cover one country at a time.

The model specifications in equations (1) to (3) consider three alternative dependent variables. First, ℓ_{bft} is the logged amount of new credit granted by bank b to firm f in quarter t . Second, r_{fbt} is the interest rate of the new loan granted by bank b to the firm f in quarter t . Finally, τ_{fbt} denotes the maturity of the new loan granted by bank b to firm f in quarter t , in logarithm. Moreover, model specifications in equations (1) to (3) account for multiple country trade partners for a given firm f . However, we only observe the total loans of bank b to firm f without distinguishing the loan amount associated with each trading partner of firm f . As a result, we need to stack the observations, i.e., we repeat the left-hand side values as many times as the number of countries included in the sample. However, to avoid an excessive number of stacked observations, we regroup the 140 trading partners with which Chilean firms trade into five groups: The U.S., China, the European Union (including 28 countries), the U.K., and the rest of the world. Therefore, with this procedure, we construct a firm-bank-country (or region)-time panel to estimate our regressions.

Furthermore, equations (1) to (3) isolate the bank-firm pair component of lending by using saturated regressions (Paravisini et al., 2017). Precisely, we account for bank-specific credit supply shocks (common in expectation across all firms) and firm-specific credit demand shocks (common in expectation across all banks) by including bank-time and sector-time dummies, α_{bt} , and α_{st} , respectively. The reason for including sector-time fixed effects instead of firm-time dummies is that we do not observe new loans granted continuously to the same firm throughout the sample period. Therefore, using firm-time fixed effects would have severely reduced the number of observations. To circumvent this problem, we follow Degryse et al. (2019) and include sector-time fixed effects.¹⁰ In turn, the set of time-invariant firm-bank-country fixed effects in equations (1) to (3), α_{fbc} , accounts for all unobserved heterogeneity in the firm-bank-country (or firm-bank-region) lending relationship, such as the distance between bank headquarters and the destination country. Importantly, Paravisini et al. (2017) show that by including bank-time and sector-time dummies simultaneously in the model specifications (1) to (3), the estimated loan amounts (ℓ_{fbt}) and the credit conditions (r_{fbt} and τ_{fbt} , respectively) correspond to bank-firm equilibrium outcomes. We follow this interpretation in the forthcoming analysis unless we explicitly state otherwise.

Our variable of interest is the average trade uncertainty index for the country (or region, when corresponding) c at quarter t , which we denote as TUI_{ct} in equations (1) to (3). The trade uncertainty measure is scaled by taking the logarithm of one plus the value of the index; this is to preserve the observations with a value of zero. Also,

¹⁰ The approach of using granular sector-time fixed effect also allows for a larger sample of firms than would be the case if we only used firms with multiple bank relationships in our sample.

as suggested by [Ahir et al. \(2022\)](#), we consider the three-quarter moving average of the trade uncertainty index. In turn, S_{ft}^c denotes a vector of firm-specific statuses, which allows us to distinguish among the following seven categories of firms: i) non-trade firms; ii) exporters only, who have not exported to country (or region) c over the last four quarters; iii) exporters only, who have exported to country (or region) c ; iv) importers only, who have not imported from the country (or region) c over the last four quarters; v) importers only, who have imported from the country (or region) c over the last four quarters; vi) global value chains or GVCs, that is, firms that have both exported and imported over the last four quarters, but which have not traded with the country (or region) c (over the last four quarters); vii) GVCs having traded with the country (or region) c over the last four quarters.

Notably, the interaction term between firms' statuses and the trade uncertainty index in equations (1) to (3) allows us to investigate whether trade uncertainty has affected differently those firms trading internationally *vis-à-vis* those that only trade locally. Among the trade firms, we distinguish whether the firm only exports, only imports, or does both (these are denominated GVCs) Finally, to account for the relative importance for a firm of a given country (or region) of destination/origination at a certain period, for estimation, we perform a weighted least square (WLS) procedure, with the weights ω_{fct} being calculated as follows:

$$\omega_{fct} = \frac{T_{fct}}{\sum_{k \in \mathcal{C}_{ft}} T_{fkt}}, \text{ such that } \sum_{k \in \mathcal{C}_{ft}} \omega_{fkt} = 1,$$

where T represents the total value of the exports, the imports, or the sum of both exports and imports, of firm f in quarter t . To account for the possible seasonality of trade, we compute the accumulated trade value during the last four quarters. In the case of firms that only trade locally, we assign a weight of 0.2 to each of the five destinations/origins at each firm-bank-country-quarter observation. Finally, we cluster the standard errors at the firm-bank level, as is customary in this literature.

4.1.2 Firms' heterogeneity and credit outcomes

We now investigate whether trade uncertainty affects differently the credit outcomes of certain types of firms. In particular, we distinguish firms in terms of their size (namely large and small firms) and their connectivity with trading partners (that is, firms with many or few trading partners in the rest of the world). To do this, we extend the model

specifications in equations (1) to (3) above as follows:

$$\begin{aligned} \ell_{fbt} = & \alpha_{st} + \alpha_{bt} + \alpha_{fbc} + \beta TUI_{ct} + \gamma S_{ft}^c + \delta_1 S_{ft}^c \times TUI_{ct} + \delta_2 S_{ft}^c \times 1_f \\ & + \delta_3 S_{ft}^c \times TUI_{ct} \times 1_f + \varepsilon_{fbct} \end{aligned} \quad (4)$$

$$\begin{aligned} r_{fbt} = & \alpha_{st} + \alpha_{bt} + \alpha_{fbc} + \beta TUI_{ct} + \gamma S_{ft}^c + \delta_1 S_{ft}^c \times TUI_{ct} + \delta_2 S_{ft}^c \times 1_f \\ & + \delta_3 S_{ft}^c \times TUI_{ct} \times 1_f + \varepsilon_{fbct} \end{aligned} \quad (5)$$

$$\begin{aligned} \tau_{fbt} = & \alpha_{st} + \alpha_{bt} + \alpha_{fbc} + \beta TUI_{ct} + \gamma S_{ft}^c + \delta_1 S_{ft}^c \times TUI_{ct} + \delta_2 S_{ft}^c \times 1_f \\ & + \delta_3 S_{ft}^c \times TUI_{ct} \times 1_f + \varepsilon_{fbct} \end{aligned} \quad (6)$$

Equations (4) to (6) include an additional categorical variable, 1_f , that takes the value of one if the firm is large (has many trading partners). To identify the largest firms (firms with many trading partners), we consider those whose average loan amounts (number of trading partners as defined in terms of total trade, that is, exports and imports) throughout the sample period are in the upper tertile of loan size (number of trading partners).

4.1.3 Banks' heterogeneity in the credit supply

To study whether certain banks' business model traits influence the amount of credit provided and the credit conditions under periods of high trade uncertainty, we start by modifying the model specifications in equations (1) to (3) by including a matrix of time-varying (one-quarter-lagged) bank controls $\mathbf{X}_{b,t-1}$. Specifically, we consider the NPL ratio, the capital ratio, assets, and liquidity as bank controls. This approach, of course, requires not including the bank-time dummies α_{bt} . This is because they would otherwise absorb all the bank-time varying effects.

As business model traits, we consider the balance sheet quality, the share of liabilities in foreign currency, whether the bank is foreign, the intensity of linkages between the Chilean bank with its headquarters, and finally, the banks' specialization measure as defined in [Paravisini et al. \(2017\)](#). In particular, the specialization measure accounts for the possibility that banks specialize in specific foreign markets by lending to firms mainly trading with these countries. To construct our specialization measure, instead of considering exports as in [Paravisini et al. \(2017\)](#), we rely on the sum of exports and imports to a given foreign country.

To examine the influence of the specific traits on the funding conditions granted by banks under periods of trade uncertainty, for the majority of the traits, we interact, one at a time, with a dummy variable that takes the value of one if the given (one-quarter-lagged) business model trait is above its median (and zero if it is below), with the trade

uncertainty indexes of the countries (regions) with which a given firm trades. Note that in the case of the specialization measure, we do not build the indicator variable (for above the median values) because the specialization variable is already a dummy regressor. Likewise, in the case of the characteristic being a foreign or a domestic bank, this is also a dummy variable already.

The model specifications that account for the influence of banks' business model traits on credit outcomes under periods of trade uncertainty become,

$$\ell_{fbt} = \alpha_{st} + \alpha_{fbc} + \beta TUI_{ct} + \gamma \mathbf{X}_{b,t-1} + \psi Z_{b,t-1} + \delta Z_{b,t-1} \times TUI_{ct} + \varepsilon_{fbct} \quad (7)$$

$$r_{fbt} = \alpha_{st} + \alpha_{fbc} + \beta TUI_{ct} + \gamma \mathbf{X}_{b,t-1} + \psi Z_{b,t-1} + \delta Z_{b,t-1} \times TUI_{ct} + \varepsilon_{fbct} \quad (8)$$

$$\tau_{fbt} = \alpha_{st} + \alpha_{fbc} + \beta TUI_{ct} + \gamma \mathbf{X}_{b,t-1} + \psi Z_{b,t-1} + \delta Z_{b,t-1} \times TUI_{ct} + \varepsilon_{fbct} \quad (9)$$

where $Z_{b,t-1}$ denotes the dummy variable for the business model trait under consideration.

4.2 Inspecting the real effects of trade uncertainty

We now focus on firms trading with foreign markets and investigate whether trade uncertainty affects foreign trade. Precisely, we examine the following two questions: i) whether and to what extent trade uncertainty impacts foreign trade operations; ii) does the reaction of trading firms to periods of high uncertainty depend on how foreign trade is financed?

To answer the research questions above, first, we need to examine whether trade uncertainty has affected foreign trade operations. With this aim, we propose the following baseline model specification:

$$\Delta T_{fpct} = \alpha_{fpc} + \alpha_{fpt} + \alpha_{pcy} + \beta TUI_{ct} + \varepsilon_{fpct}. \quad (10)$$

The dependent variable in equation (10) corresponds to the year-on-year quarterly changes of the logged trade values, with the trade values being the exports, the imports, or the sum of exports and imports of product p traded by the firm f from/to country c in quarter t .¹¹ Therefore, the model specification in equation (10) involves a firm-product-country-quarter panel. This is thanks to the richness and granularity of our customs data. To account for firms' specialization in some products and countries, we include firm-product-country fixed effects α_{fpc} . In turn, to capture firm-product-

¹¹ Note that in equation (10), we no longer group countries by regions, as with the regressions for credit outcomes

specific demand shocks, we add firm-product-quarter dummies, hereafter α_{fpt} . Finally, to account for unobserved heterogeneity in the product-country foreign trade transactions, which may evolve through time, we include product-country-year dummies, which we denote as α_{pcy} .

Standard errors are clustered at the firm-quarter level to account for the fact that the firm decides every period whether to trade internationally a product p with country c . To account for the importance of a given destination/origin for a firm at a given period, we estimate a WLS regression using weights ω_{fcq}^θ defined as follows:

$$\omega_{fct} = \frac{T_{fct}}{T_{ft}} = \frac{\sum_{s \in \mathcal{P}_{ft}} T_{fsct}}{\sum_{k \in \mathcal{C}_{ft}} \sum_{s \in \mathcal{P}_{ft}} T_{fskt}}, \text{ such that } \sum_{k \in \mathcal{C}_{ft}} \omega_{fct} = 1$$

Second, we investigate whether the reaction of trade firms to trade uncertainty depends on the way trade operations are mainly financed. To do this, we augment the model specification in equation (10) as follows:

$$\Delta T_{fpct} = \alpha_{fpc} + \alpha_{fpt} + \alpha_{pcy} + \beta TUI_{ct} + \gamma F_{fpct} + \theta F_{fpct} \times TUI_{ct} + \varepsilon_{fpct}, \quad (11)$$

where F_{fpct} is a categorical variable if the operation is financed mainly with payment-in-advance, trade credit, or bank credit.

Finally, as a robustness check, we examine whether increases in trade uncertainty in foreign markets may have led to Chilean firms substituting among products and/or countries (of origin/destination, when corresponding). To do so, we modify the weights we use to estimate Equation (10) and Equation (11). Specifically, we consider two alternative possibilities: (i) without weights; (ii) with weights at the product level such that $\sum_{s \in \mathcal{P}_{ft}} \omega_{fpt} = 1$. Intuitively, by comparing the estimated effects of TUI on trade growth with different weighting schemes, we can shed some light about firms' ability to substitute countries of destination (origins) for their exports (imports) and/or products when trade uncertainty in a given foreign market c increases.

5 Results

5.1 On credit outcomes

5.1.1 Baseline estimates

To investigate the impact of trade uncertainty on credit outcomes, we examine the following two aspects: i) does trade uncertainty affect domestic credit outcomes?; ii) does trade uncertainty impact credit granting differently for non-trade firms relative to firms trading internationally? In particular, within the trade firms, we distinguish among exporters, importers, and GVCs having traded or not with a given foreign country (or region) c experiencing increasing trade uncertainty. We can disentangle these heterogeneous impacts thanks to the interaction term between the country-specific trade uncertainty indexes and the foreign-trade firm's status.

To begin with, Table 1 exhibits the estimates of the model specifications in equations (1) to (3), but excluding the categorical variable for the firm's status and its interaction with TUI. Next, Table 2 exhibits the estimates for the complete model specifications in equations (1) to (3). The first and second columns in each table report the estimates for loan amounts distinguishing between total loan amounts and loan amounts in local currency or LC, respectively. In turn, columns 3 and 4 in each table examine the impact of trade uncertainty on interest rates (again distinguishing between total loans and loans in LC, respectively), whereas the last two columns have as dependent variable loan maturities. The top panel in each table reports the estimated coefficients, while the bottom panel in each table exhibits the marginal effects of trade uncertainty for the various firm statuses.

In particular, the variable foreign-trade firm's status allows us to classify firms into seven categories, with their labels being as follows: 0 = non-trade firm; 1 = exporter not having exported to country (or region) c over the last year; 2 = exporter having exported to the country c over the last year; 3 = importer not having imported from the country (or region) c (over the last year); 4 = importer having imported from the country (or region) c ; 5 = GVC not trading with the country (or region) c over the last year; and 6 = GVC trading with the country (or region) c .

Table 1: Overall impact of country-specific trade uncertainty indexes on credit outcomes: Loan amounts, interest rates, and maturities

	(1)	(2)	(3)	(4)	(5)	(6)
	Amount	Amount	Int. Rate	Int. Rate	Maturity	Maturity
	All	LC	All	LC	All	LC
TUI_{ct}	-0.0012*	-0.0002	-0.0036	0.0010	-0.0005	0.0001
	(0.0007)	(0.0007)	(0.0023)	(0.0023)	(0.0007)	(0.0007)
Firm-bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,562,792	1,996,289	2,562,792	1,996,289	2,562,792	1,996,289
R^2	0.8157	0.8230	0.8192	0.8079	0.6086	0.6466
Adjusted- R^2	0.7725	0.7758	0.7768	0.7567	0.5169	0.5523

This table exhibits the estimates of equations (1), (2), and (3) without distinguishing among firms' foreign trade statuses, hence $\delta = \gamma = 0$. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. LC stands for local currency and Int. Rate, for interest rates. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 2: Impact of country-specific trade uncertainty indexes on credit outcomes distinguishing among firms' foreign trade statuses

	(1) Amount All	(2) Amount LC	(3) Int. Rate All	(4) Int. Rate LC	(5) Maturity All	(6) Maturity LC
Estimated coefficients						
TUI_{ct}	-0.006*** (0.001)	-0.003*** (0.001)	-0.039*** (0.004)	0.005 (0.004)	-0.005*** (0.001)	-0.004*** (0.001)
$TUI_{ct} \times Status_{fct} = 1$	-0.018* (0.011)	-0.016 (0.012)	0.092** (0.040)	0.061 (0.044)	0.004 (0.010)	(0.008) (0.011)
$TUI_{ct} \times Status_{fct} = 2$	0.019** (0.008)	0.010 (0.016)	0.157*** (0.037)	0.031 (0.087)	0.011 (0.009)	0.031* (0.019)
$TUI_{ct} \times Status_{fct} = 3$	0.003 (0.003)	0.005 (0.003)	0.010 (0.012)	0.010 (0.012)	0.007** (0.003)	(0.008**) (0.003)
$TUI_{ct} \times Status_{fct} = 4$	0.012*** (0.003)	0.013*** (0.003)	0.047*** (0.010)	-0.017 (0.012)	0.010*** (0.003)	(0.008**) (0.003)
$TUI_{ct} \times Status_{fct} = 5$	0.002 (0.008)	0.004 (0.009)	-0.042 (0.028)	-0.041 (0.033)	0.015** (0.007)	(0.015* (0.008)
$TUI_{ct} \times Status_{fct} = 6$	0.012*** (0.003)	0.007* (0.003)	0.135*** (0.009)	-0.025** (0.011)	0.010*** (0.002)	(0.012*** (0.003)
Marginal effect of TUI_{ct} at:						
Status $_{fct} = 0$	-0.006*** (0.001)	-0.003*** (0.001)	-0.039*** (0.004)	0.005 (0.004)	-0.005*** (0.001)	-0.004*** (0.001)
Status $_{fct} = 1$	-0.024** (0.011)	-0.019 (0.012)	0.053 (0.039)	0.065 (0.043)	-0.002 (0.010)	0.005 (0.011)
Status $_{fct} = 2$	0.013 (0.008)	0.007 (0.016)	0.118*** (0.037)	0.036 (0.087)	0.006 (0.009)	0.028 (0.019)
Status $_{fct} = 3$	-0.003 (0.003)	0.002 (0.003)	-0.029*** (0.010)	0.015 (0.010)	0.002 (0.003)	0.004 (0.003)
Status $_{fct} = 4$	0.006*** (0.002)	0.010*** (0.003)	0.008 (0.009)	-0.012 (0.011)	0.005** (0.002)	0.005 (0.003)
Status $_{fct} = 5$	-0.004 (0.008)	0.001 (0.009)	-0.081*** (0.027)	-0.036 (0.032)	0.010 (0.007)	0.012 (0.008)
Status $_{fct} = 6$	0.007*** (0.002)	0.004 (0.003)	0.096*** (0.007)	-0.020** (0.010)	0.005** (0.002)	0.009*** (0.003)
Firm-Bank-Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,562,792	1,996,289	2,562,792	1,996,289	2,562,792	1,996,289
R^2	0.816	0.823	0.819	0.808	0.609	0.647
Adjusted- R^2	0.773	0.776	0.777	0.757	0.517	0.552

This table exhibits the estimates of equations (1), (2), and (3), controlling for the foreign-trade status of the firm. Alternative dependent variables are the logarithm of the loan amounts, annualized interest rates, and the logarithm of the maturity of the new loans granted. The foreign-trade status of the firms is a categorical variable of value 0 if the firm only trades domestically; 1 if the firm only exports but has not exported to the country c during the last four quarters and 2 if it has; 3 and 4 are analogous to 1 and 2, but for firms that only import; 5 and 6 are also analogous to 1 and 2 but for GVC firms. Marginal effects are calculated as the sum of the coefficients on TUI_{ct} and its interaction with the status variable. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. LC stands for local currency, and Int. Rate for interest rates * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To begin with, Table 1 shows that the overall impact of increasing trade uncertainty on credit outcomes is non-significant at the 5% level, regardless of the dependent variable we consider. However, when distinguishing by foreign-trade firms' statuses, Table 2 shows that increases in trade uncertainty do result in significant changes in loan amounts, interest rates, and maturities. More specifically, when examining the marginal effects of the interaction term between the foreign-trade firms' statuses and the trade uncertainty index, first, we find that when trade uncertainty augments, new loan amounts decrease for non-trade firms (our base category). The same occurs for the maturities and the interest rates of the new loans that non-trade firms receive. This latter finding indicates that there is no worsening of credit conditions to non-trade firms *per se*, but rather a reduction in the loan maturities and interest rates of the new loans granted to them as a result of higher trade uncertainty.

Second, focusing now on trade firms, Table 2 shows heterogeneous patterns for the new loan amounts and the credit conditions depending on the foreign-trade firm's status. In the case of exporters, we find no significant impact of trade uncertainty on the new loan amounts to the exporters exposed to the destination countries with increasing trade tensions. It thus indicates that under periods of higher trade uncertainty, banks do not assist exporters affected by the increasing trade uncertainty. As a result, exporters may need to rely more upon their working capital to finance the production of goods and services to export. Alternatively, they may need to reduce their exports. We will re-examine these hypotheses in Section 5.2 when studying the impact of trade uncertainty on export growth.

In turn, the marginal impact on the interest rates charged to firms exporting to a country (or region) c with elevated trade uncertainty is positive and statistically significant (in contrast, the marginal impact of TUI on the interest rates of the new loans given to exporters not trading with a country (or region) c (where the TUI increases) is statistically insignificant).¹² We interpret this result as indicating that banks perceive firms exporting to countries with elevated trade uncertainty as riskier. This is presumably because exporters face the risk of not being paid for the products they produce and export, with this risk increasing during periods of trade uncertainty. In the case of the firms not exporting to country (or region) c exhibiting higher TUI, the negative (and statistically significant) estimated coefficient in Table 2 for loan amounts, which amounts to -0.024, indicates that the new loans granted to these firms are smaller when trade uncertainty augments (as it is the case with non-trade firms).

¹² Although we do not observe the loan amounts associated with each foreign trading partner of a firm f , stacking observations and weighting them by the importance of a given country (or region) of destination/origin for firms allows us to assess how trade uncertainty affects the credit provision to firms trading and/or not trading to a country (or region) where the TUI has increased.

Focusing now on importers, Table 2 shows that the new loan amounts granted to firms importing from countries with higher trade uncertainty do increase when TUI augments, thus reflecting that banks help importers cope with the exogenous variations in (origin-specific) trade uncertainty. In addition, we find that the credit conditions for importers improve when they are exposed to higher trade uncertainty. This is reflected in the marginal impact of TUI on the maturity of the new loans to these firms being positive and significant, without a significant marginal impact (of TUI) on interest rates for these firms. This is interesting as it indicates that in the case of importers affected by higher trade uncertainty, banks may not amplify the initial (trade uncertainty) shock but, oppositely, moderate its impact on credit outcomes.

Finally, when examining the marginal impact on the credit conditions of the new loans granted to GVC firms following an increase in trade uncertainty, we find a similar pattern to the one described for firms importing from countries exhibiting higher trade uncertainty. Precisely, Table 2 shows that not only the amounts of the new loans granted to them but also the maturity and the interest rates of these new loans increase when the trade uncertainty of the country with which these GVCs are trading augments. To put these results in economic terms, in the case of a GVC, an increase of 12 points in the trade uncertainty index of a country with which the GVC firm is trading (11.7 points is the increase in the trade uncertainty index of the U.K. registered between the second and third quarter of 2018) implies an 8.2% expansion of new credit granted to these firms, at 11.2 bp higher interest rates, and with 5.8% longer maturity (in days). For these computations, we consider the estimates when including all loans.¹³ In addition, note that the findings discussed above do not depend on the denomination currency. This is because when comparing the column estimates in Table 2 corresponding to total loans and loans in local currency, the results are globally consistent between them.

One question that arises when examining the evidence in Table 2 is whether the significant impacts of TUI on (equilibrium) credit outcomes are reflecting a change in the aggregate supply and/or demand of new credits, or rather they are indications of a credit reallocation between different types of firms. In an effort to address this important question, we rely on the Banking Credit Survey, which is a survey conducted quarterly by the Central Bank of Chile (since 2003) to bank officers. Bank officers have to respond to two sets of questions: (i) whether the bank where they work is currently easing or tightening the credit standards; (i) whether they currently observe a higher or lower credit demand. The debtor categories the survey considers are large firms, small firms,

¹³ Considering the averages for foreign-trade firms in Table B.1, in economic terms, the increase in the TUI amounts to 90 thousand U.S. dollars more, and 5.7 more months of maturity. As a comparison, Bassett et al. (2014) find that an increase of 100 basis points in the credit spread charged by a bank is associated with a decrease in unsecured commercial and investment loans between 0.5% and 1.7%.

and construction firms. For this exercise, we focus on the first two debtor categories. One caveat of the analysis, however, is that we cannot distinguish between non-trade and trade firms and, therefore, we cannot classify firms in terms of their statuses (as we do in Table 2).

We estimate various specifications of seemingly unrelated regression equations (SURE) having as dependent variables the reported credit demand and supply conditions by bank and quarter. Specifically, we consider a set of SURE for the demand and supply of small (large) firms and finally, a set of SURE consisting of four equations for the demand and supply conditions of small and large firms simultaneously. Please refer to Appendix C for details on the methodology. Table C.1, also in the Appendix, exhibits the estimates of the various SURE.

The main finding to extract from Table C.1 is that, in the aggregate, increases in TUI do not exert any significant influence on the (reported) aggregate credit supply and demand conditions of Chilean banks. This conclusion holds regardless of the size of the firm or the SURE specification. It hence provides some support to the interpretation that increasing trade uncertainty has led to a reallocation of credit across different types of firms. However, it is worth recalling that since the Banking Credit Survey does not distinguish between non-trade and trade firms, we cannot capture changes in the relative credit supply and demand conditions of non-trade and trade firms.

Wrapping up, increasing trade uncertainty has led to a reallocation of credit towards GVC firms and importers affected by the rise in trade uncertainty. Intuitively, trade firms operating with foreign firms in countries exhibiting increasing trade uncertainty require more credit. However, if banks follow a risk-mitigating strategy, when trade uncertainty augments, they would grant more credit to those firms perceived by them as entailing smaller risks. We document that these are GVCs and importers. Banks may perceive GVCs as entailing lower risks since they export and import at the same time to/from a given country; hence, their balance sheets are likely to be better hedged (as the risk they are exposed to simultaneously affects their assets and liabilities). In the case of importers, banks may perceive them as less risky since trade uncertainty affects them through a reduction in the credit they receive from foreign firms. Importers can hence look for alternative sources of funding for their imports when trade uncertainty augments. In contrast, banks may perceive exporters as riskier (compared to GVCs and importers) because exporters face the risk of not being paid for the products they produce and export, with this risk increasing under periods of growing trade uncertainty. In the next section, we exploit firms' heterogeneities to dig deeper into the mechanisms

explaining our credit reallocation finding. In turn, Section 5.2 links this result with the impact of trade uncertainty on foreign trade growth and the way Chilean firms finance their foreign trade operations. This will allow us to investigate the linkages between trade uncertainty, firms' foreign trade activities, and trade finance.

5.1.2 The influence of firm characteristics on credit outcomes

We now exploit firms' heterogeneities to assess whether trade uncertainty has affected differently credit outcomes depending on firms' characteristics. In particular, we focus on two characteristics: size and how connected trade firms are to the rest of the world, as measured by the number of trading partners a firm has on average. Table 3 exhibits the marginal estimated effects of equations (4) to (6) when 1_f is the indicator variable for large firms. In turn, Table 4 presents the marginal effects when estimating equations (4) to (6) but when 1_f is the dummy variable for firms with many trading partners.

Table 3: Impact of country-specific trade uncertainty indexes on credit outcomes distinguishing among firm's size and foreign-trade status

	(1)	(2)	(3)	(4)	(5)	(6)
	Amount	Amount	Int. Rate	Int. Rate	Term	Term
	Total	LC	Total	LC	Total	LC
Marginal effects of TUI_{ct} on small firms at:						
Status _{fct} = 0	-0.012*** (0.001)	-0.009*** (0.001)	-0.025*** (0.006)	0.022*** (0.005)	-0.005*** (0.002)	-0.004*** (0.001)
Status _{fct} = 1	-0.067*** (0.017)	-0.061*** (0.018)	0.103 (0.090)	0.153 (0.095)	0.010 (0.019)	0.013 (0.018)
Status _{fct} = 2	0.028 (0.017)	0.010 (0.027)	-0.047 (0.077)	-0.021 (0.097)	0.007 (0.021)	0.035 (0.024)
Status _{fct} = 3	-0.005 (0.005)	-0.000 (0.005)	-0.026 (0.022)	0.021 (0.022)	0.007 (0.005)	0.010* (0.005)
Status _{fct} = 4	-0.000 (0.003)	0.003 (0.005)	-0.022 (0.015)	-0.003 (0.019)	0.006* (0.004)	0.008* (0.005)
Status _{fct} = 5	0.007 (0.017)	-0.012 (0.022)	-0.173** (0.080)	0.015 (0.085)	0.022 (0.020)	0.001 (0.018)
Status _{fct} = 6	-0.001 (0.007)	0.000 (0.010)	0.003 (0.024)	-0.030 (0.032)	0.005 (0.006)	0.012 (0.009)
Marginal effects of TUI_{ct} on large firms at:						
Status _{fct} = 0	0.005** (0.002)	0.009*** (0.002)	-0.062*** (0.007)	-0.026*** (0.007)	-0.005*** (0.002)	-0.002 (0.002)
Status _{fct} = 1	-0.006 (0.013)	0.004 (0.016)	0.034 (0.041)	0.017 (0.043)	-0.006 (0.012)	0.001 (0.014)
Status _{fct} = 2	0.010 (0.009)	0.007 (0.019)	0.157*** (0.041)	0.061 (0.121)	0.006 (0.010)	0.024 (0.025)
Status _{fct} = 3	-0.001 (0.003)	0.004 (0.004)	-0.033*** (0.011)	0.010 (0.012)	-0.001 (0.003)	0.001 (0.003)
Status _{fct} = 4	0.010*** (0.003)	0.014*** (0.004)	0.028*** (0.010)	-0.017 (0.013)	0.005 (0.003)	0.003 (0.004)
Status _{fct} = 5	-0.006 (0.008)	0.005 (0.010)	-0.058** (0.028)	-0.048 (0.033)	0.007 (0.007)	0.014 (0.009)
Status _{fct} = 6	0.008*** (0.002)	0.004 (0.003)	0.107*** (0.007)	-0.019** (0.010)	0.005** (0.002)	0.008*** (0.003)
Obs.	2,562,792	1,996,289	2,562,792	1,996,289	2,562,792	1,996,289
R^2	0.816	0.823	0.819	0.808	0.609	0.647
Adjusted R^2	0.773	0.776	0.777	0.757	0.517	0.552
Firm-bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-quarter FE	Yes	Yes	Yes	Yes	Yes	Yes

This table exhibits the estimates of equations (4), (5), and (6), controlling for the foreign-trade status and the size of the firm. The dependent variables are the logarithm of the loan amounts, the annualized interest rates, and the logarithm of the maturity of the new loans granted. The foreign-trade status of the firms is a categorical variable of value 0 if the firm only trades domestically; 1 if the firm only exports but has not exported to the country c during the last four quarters and 2 if it has; 3 and 4 are analogous to 1 and 2, but for firms that only import; 5 and 6 are also analogous to 1 and 2 but for GVC firms. Large firms are those whose average total amount of new loans is in the upper tertile of the sample. Marginal effects are calculated as the sum of the coefficients on TUI_{ct} and its interaction with the status variable. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. LC stands for local currency and Int. Rate for interest rates * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Impact of country-specific trade uncertainty indexes on credit outcomes distinguishing among firms' foreign trade statuses and number of trading partners

	(1) Amount Total	(2) Amount LC	(3) Int. Rate Total	(4) Int. Rate LC	(5) Term Total	(6) Term LC
Marginal effects of TUI_{ct} on firms with few trading partners at:						
Status $_{fct} = 0$	-0.006*** (0.001)	-0.003*** (0.001)	-0.040*** (0.004)	0.005 (0.004)	-0.005*** (0.001)	-0.004*** (0.001)
Status $_{fct} = 1$	-0.020* (0.012)	-0.016 (0.013)	0.054 (0.045)	0.081 (0.049)	-0.003 (0.011)	0.004 (0.012)
Status $_{fct} = 2$	0.016 (0.014)	0.002 (0.022)	0.003 (0.076)	0.096 (0.140)	0.004 (0.019)	0.044* (0.026)
Status $_{fct} = 3$	-0.002 (0.003)	0.003 (0.003)	-0.033*** (0.011)	0.010 (0.011)	0.002 (0.003)	0.004 (0.003)
Status $_{fct} = 4$	0.007** (0.003)	0.008** (0.004)	-0.025* (0.013)	-0.028** (0.014)	0.006* (0.004)	0.006 (0.004)
Status $_{fct} = 5$	-0.012 (0.011)	-0.009 (0.012)	-0.077** (0.037)	-0.026 (0.039)	0.004 (0.010)	0.009 (0.010)
Status $_{fct} = 6$	0.009 (0.007)	0.010 (0.009)	-0.018 (0.027)	-0.053* (0.029)	0.008 (0.007)	0.017* (0.009)
Marginal effects of TUI_{ct} on firms with many trading partners at:						
Status $_{fct} = 1$	-0.029 (0.025)	-0.031 (0.031)	0.032 (0.078)	-0.004 (0.088)	0.005 (0.022)	0.007 (0.029)
Status $_{fct} = 2$	0.012 (0.009)	0.018 (0.022)	0.179*** (0.037)	-0.048 (0.083)	0.008 (0.009)	0.006 (0.024)
Status $_{fct} = 3$	-0.009 (0.007)	-0.004 (0.008)	-0.005 (0.027)	0.058** (0.028)	0.003 (0.009)	0.003 (0.009)
Status $_{fct} = 4$	0.005 (0.003)	0.012*** (0.004)	0.038*** (0.012)	0.008 (0.016)	0.005 (0.003)	0.002 (0.004)
Status $_{fct} = 5$	0.013 (0.011)	0.022* (0.013)	-0.116*** (0.043)	-0.076 (0.055)	0.023** (0.010)	0.022* (0.013)
Status $_{fct} = 6$	0.006*** (0.002)	0.003 (0.003)	0.106*** (0.007)	-0.016 (0.010)	0.005** (0.002)	0.008** (0.003)
Obs.	2562792	1996289	2562792	1996289	2562792	1996289
R^2	0.816	0.823	0.820	0.808	0.609	0.647
Adjusted R^2	0.773	0.776	0.777	0.757	0.517	0.552

This table exhibits the estimates of equations (4), (5), and (6), controlling for the foreign-trade status and for the number of trader partners firms have. The dependent variables are the logarithm of the loan amounts, the annualized interest rates, and the logarithm of the maturity of the new loans granted. The foreign-trade status of the firms is a categorical variable of value 0 if the firm only trades domestically; 1 if the firm only exports but has not exported to the country c during the last four quarters and 2 if it has; 3 and 4 are analogous to 1 and 2, but for firms that only import; 5 and 6 are also analogous to 1 and 2 but for GVC firms. Firms with many trading partners are those whose average number of trading partners is in the upper tertile. Firms without foreign trade are assigned a value of 0. Marginal effects are calculated as the sum of the coefficients on TUI_{ct} and its interaction with the status variable. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. LC stands for local currency and Int. Rate for interest rates * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Results in Table 3 show that when trade uncertainty increases, there is a crowding out effect from small non-trade firms and small exporters not directly affected by the increasing TUI towards larger GVCs and importers that are exposed to growing trade uncertainty. Interestingly, these findings are consistent with a risk selection strategy from banks that may perceive larger firms as better prepared to handle negative shocks, such as increases in trade uncertainty. As such, results in Table 3 add to our analysis in Table 2 by showing that larger GVCs and importers may be the ones being perceived by banks as involving smaller risks.

Interesting for our analysis, focusing on the COVID-19 shock, Greenwald et al. (2020) find that smaller firms were more subject to bank scrutiny during the pandemic. An additional and complementary interpretation of Table 3 is that larger firms may rely more intensively on domestic banks when credit conditions in foreign markets or from foreign firms become more restrictive. In the same line, Chodorow-Reich et al. (2022) show that during the COVID-19 pandemic, large firms draw out more from their credit lines, compared to smaller firms.

When distinguishing firms in terms of the number of trading partners they have, results in Table 4 are also consistent with a crowding-out effect, this time, from firms with few foreign trade connections towards more connected firms. In this regard, larger firms tend also to be those that have more trading partners (as Table B.4, in the Appendix, suggests). However, the evidence (of a crowding-out effect) is slightly less conclusive as the marginal impacts of TUI for total amounts are only significantly positive for GVCs exposed to increasing TUI.¹⁴

5.1.3 The influence of business model traits on credit outcomes

We now investigate whether some business model traits make banks more or less likely to provide more credit to firms under periods of higher trade uncertainty. For the analysis, we estimate the model specification in equations (7), (8), and (9). To capture banks' business model traits, as detailed in section 4.1.3, for the majority of the traits, we interact, one at a time, a dummy variable that takes the value of one when the given business model trait is above its median (and zero if it is below), with the trade uncertainty indexes of the countries (regions) with which a given firm trades.

¹⁴ As a robustness check, instead of measuring firms' connectivity with the number of trading partners, we rely on the Herfindal-Hirschman index to capture trade concentration among countries. Results with this alternative proxy are consistent to the ones reported in Table 4. Estimates are available from the authors upon request.

The traits we consider are the balance sheet quality, the share of liabilities in foreign currency, whether the bank is foreign, the intensity of linkages between the Chilean bank and its headquarters, and the banks' specialization measure as defined in [Paravisini et al. \(2017\)](#). Note that in the case of banks classified in terms of their NPLs, we construct a categorical variable that takes three possible values: Low risk, high risk, and *Banco Estado*, which is the largest public bank in Chile. The reason for this different treatment for *Banco Estado* is that this bank has a social role in providing credit to debtors that may not be eligible for credit in other financial institutions. As a result, the share of NPLs in this public bank is considerably larger compared to the other banks in the system, which in turn justifies having it as a separate category. Table 5 considers loan amounts as the dependent variable, whereas Tables 6, and 7 have interest rates and maturities, respectively, as regressors. The column heads in each table indicate the business model trait being analyzed in the corresponding column of estimated results.

To begin with, Table 5 shows that larger and riskier banks, excluding *Banco Estado*, as well as banks with a larger share of liabilities in foreign currency, are the ones expanding credit more intensively when trade uncertainty augments. Oppositely, we find that banks with weak linkages with their headquarters (which occurs when the cross-border positions between the given bank and its headquarters in the country (or region) c are below the median cross-border positions) and domestic banks decrease their credit provision when trade uncertainty augments, compared to banks with strong linkages to their headquarters and foreign banks.

We conclude from the above that riskier banks, larger banks, and banks with more liabilities in foreign currency have unique features that allow them to provide more credit under periods of increasing trade uncertainty. In the case of riskier banks, this may be because these banks are more used to taking risks, whereas, in the case of larger banks and banks with more liabilities in foreign currency, they may have a better capacity to diversify risks and obtain alternative funding sources, thus being able not to contract credit when trade uncertainty increases. A similar (but reverse) reasoning may explain why banks with weak linkages with their headquarters and domestic banks appear to tighten credit when the country-specific trade uncertainty index increases.

One additional interesting finding regards banks' specialization. Table 5 shows that when trade uncertainty augments, banks that are specialized in the countries exhibiting rising trade uncertainty (through their portfolio of loans) react to the negative trade uncertainty shock by reducing the size of the new loans granted. This is hence suggesting that, in addition to reducing their individual exposures to certain types of firms (when trade uncertainty increases), banks also follow a global mitigation strategy that accounts for the overall risks banks are exposed to in their portfolio of loans.

Table 5: Investigating whether some banks' business model traits moderate the impact of increases in country-specific trade uncertainty indexes on loan amounts

	(1)	(2)	(3)	(4)	(5)	(6)
	Share of liabs. in foreign currency	Foreign trade special- ization	Gross cross- border positions with HQ	Foreign bank	NPL ratio	Bank size
Estimated coefficients						
BankChar _{bt} = 1	-0.035*** (0.006)	0.022*** (0.004)	0.011** (0.005)		0.055*** (0.009)	0.023*** (0.008)
TUI _{ct}	-0.003*** (0.001)	-0.001 (0.001)	-0.009*** (0.002)	-0.002* (0.001)	-0.007*** (0.001)	-0.015*** (0.002)
TUI _{ct} × BankChar _{bt} = 1	0.009*** (0.002)	-0.006*** (0.002)	0.008*** (0.001)	0.002 (0.002)	0.011*** (0.002)	0.019*** (0.002)
TUI _{ct} × BankChar _{bt} = 2					-0.000 (0.003)	
Marginal effect of TUI _{ct} at:						
BankChar _{bt} = 0	-0.003*** (0.001)	-0.001 (0.001)	-0.009*** (0.002)	-0.002* (0.001)	-0.007*** (0.001)	-0.015*** (0.002)
BankChar _{bt} = 1	0.005*** (0.002)	-0.007*** (0.002)	-0.001 (0.001)	-0.000 (0.001)	0.004*** (0.001)	0.004*** (0.001)
BankChar _{bt} = 2					-0.007*** (0.002)	
Firm-Bank-Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,557,746	2,557,746	2,557,746	2,557,746	2,557,746	2,557,746
R ²	0.815	0.815	0.815	0.815	0.815	0.815
Adjusted-R ²	0.771	0.771	0.771	0.771	0.771	0.771

This table exhibits the estimates of equation (7). The dependent variable is the logarithm of the total amounts of new loans granted to firm f at bank b in quarter t . BankChar_{bt} is a binary value equal to 1 if the level of the bank characteristic is above the median, and 0 otherwise. In column four, BankChar_{bt} is equal to 1 if a bank is foreign. In column five, we include a value equal to 2 for *BancoEstado*. Marginal effects of TUI_{ct} correspond to the sum of the coefficients on TUI_{ct} and its interaction with BankChar_{bt}. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. Liabs. stand for liabilities and HQ for headquarters. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: Investigating whether some banks' business model traits moderate the impact of increases in country-specific trade uncertainty indexes on new loan interest rates

	(1)	(2)	(3)	(4)	(5)	(6)
	Share of liabs. in foreign currency	Foreign trade special- ization	Gross cross- border positions with HQ	Foreign bank	NPL ratio	Bank size
	Estimated coefficients					
BankChar _{bt} = 1	0.253*** (0.020)	-0.066*** (0.014)	-0.205*** (0.016)		0.043 (0.038)	0.453*** (0.027)
TUI _{ct}	-0.009*** (0.003)	-0.006** (0.002)	0.073*** (0.005)	0.079*** (0.004)	0.074*** (0.005)	0.080*** (0.006)
TUI _{ct} × BankChar _{bt} = 1	0.025*** (0.008)	0.109*** (0.007)	-0.073*** (0.005)	-0.196*** (0.007)	-0.144*** (0.007)	-0.118*** (0.007)
TUI _{ct} × BankChar _{bt} = 2					0.006 (0.009)	
	Marginal effects of TUI _{ct} at:					
BankChar _{bt} = 0	-0.009*** (0.003)	-0.006** (0.002)	0.073*** (0.005)	0.079*** (0.004)	0.074*** (0.005)	0.080*** (0.006)
BankChar _{bt} = 1	0.016** (0.006)	0.103*** (0.007)	-0.000 (0.002)	-0.116*** (0.005)	-0.070*** (0.004)	-0.038*** (0.003)
BankChar _{bt} = 2					0.080*** (0.007)	
Firm-Bank-Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,557,746	2,557,746	2,557,746	2,557,746	2,557,746	2,557,746
R ²	0.815	0.815	0.815	0.815	0.815	0.815
Adjusted-R ²	0.771	0.771	0.771	0.772	0.771	0.771

This table exhibits the estimates of equation (8). The dependent variable is the annualized interest rate of new loans granted to firm f at bank b in quarter t . BankChar_{bt} is a binary value equal to 1 if the level of the bank characteristic is above the median and 0 otherwise. In column four, BankChar_{bt} equals 1 if a bank is foreign. In column five, we include a value equal to 2 for *Banco Estado*. Marginal effects of TUI_{ct} correspond to the sum of the coefficients on TUI_{ct} and its interaction with BankChar_{bt}. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. Liabs. stand for liabilities and HQ for headquarters. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Investigating whether some banks' business model traits moderate the impact of increases in country-specific trade uncertainty indexes on new loan maturities by banks' characteristics

	(1)	(2)	(3)	(4)	(5)	(6)
	Share of liabs. in foreign currency	Foreign trade special- ization	Gross cross- border positions with HQ	Foreign bank	NPL ratio	Bank size
	Estimated coefficients					
BankChar _{bt} = 1	-0.086*** (0.005)	0.003 (0.004)	0.048*** (0.004)		0.055*** (0.010)	-0.037*** (0.008)
TUI _{ct}	-0.007*** (0.001)	-0.000 (0.001)	-0.007*** (0.001)	0.005*** (0.001)	-0.016*** (0.001)	-0.014*** (0.002)
TUI _{ct} × BankChar _{bt} = 1	0.025*** (0.002)	0.003 (0.002)	0.006*** (0.001)	-0.011*** (0.002)	0.027*** (0.002)	0.019*** (0.002)
TUI _{ct} × BankChar _{bt} = 2					0.010*** (0.003)	
	Marginal effect of TUI _{ct} at:					
BankChar _{bt} = 0	-0.007*** (0.001)	-0.000 (0.001)	-0.007*** (0.001)	0.005*** (0.001)	-0.016*** (0.001)	-0.014*** (0.002)
BankChar _{bt} = 1	0.019*** (0.002)	0.003 (0.002)	-0.001 (0.001)	-0.007*** (0.001)	0.012*** (0.001)	0.006*** (0.001)
BankChar _{bt} = 2					-0.005** (0.002)	
Firm-Bank-Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,557,746	2,557,746	2,557,746	2,557,746	2,557,746	2,557,746
R ²	0.605	0.605	0.605	0.605	0.605	0.605
Adjusted-R ²	0.512	0.512	0.512	0.512	0.512	0.512

This table exhibits the estimates of equation (9). The dependent variable is the logarithm of the maturity of new loans granted to firm f at bank b in quarter t . BankChar_{bt} is a binary value equal to 1 if the level of the bank characteristic is above the median, and 0 otherwise. In column four, BankChar_{bt} equals 1 if a bank is foreign. In column five, we include a value equal to 2 for *Banco Estado*. Marginal effects of TUI_{ct} correspond to the sum of the coefficients on TUI_{ct} and its interaction with BankChar_{bt}. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. Liabs. stand for liabilities and HQ for headquarters. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Focusing now on the model estimates when interest rates and loan maturities are the dependent variables (Tables 6 and 7, respectively), we find that riskier and larger banks not only provide more credit but also offer more advantageous credit conditions under periods of trade uncertainty. This is because they appear to extend new loans with longer maturities and lower interest rates (the opposite is true for less risky and smaller banks). Furthermore, when trade uncertainty augments, banks with a larger share of liabilities in foreign currency and domestic banks extend new credits with longer maturities but with higher interest rates, thus reflecting a term premium (the opposite is true for banks with a smaller share of liabilities in foreign currency and foreign banks). Finally, banks specializing in foreign countries exhibiting rising trade uncertainty (as proxied by the specialization measure à la Paravisini et al. (2017)) react to the trade uncertainty shock not only by reducing the size of the new credits granted but also by increasing the interest rates of these new loans.

Summing up, results indicate that there are indeed some business model traits that make banks more likely to extend new loans during periods of increasing trade uncertainty. These banks' traits are size, risk, and the availability of alternative funding sources, with the latter being proxied as having a larger share of liabilities in foreign currency, or as being a foreign bank with strong linkages with its headquarters. In the next section, we analyze the impact of trade uncertainty on firms' foreign trade operations.

5.1.4 Robustness checks

We run a battery of robustness checks. To begin with, we examine which type of debt is the most sensitive to increasing trade uncertainty. With this aim, Tables B.5, B.6, and B.7, in the Appendix, present the estimates for loan amounts, interest rates, and maturities (equations (1) to (3)), respectively, distinguishing by debt type (commercial, foreign-trade, and development loans). Interestingly, results show that new credit to trade firms during periods of higher trade uncertainty has been mainly provided through commercial loans. Likewise, interest rates and loan maturities of commercial loans are the most sensitive debt types to increases in trade uncertainty. Furthermore, the negative estimated marginal impact of trade uncertainty on credit to non-trade firms also occurs mainly through commercial loans.

Second, one concern that may arise when relying on country-specific trade uncertainty indexes is that the indexes may be driven by a common trend simultaneously affecting all indexes. To address this possibility, we detrend the country-specific trade uncertainty indexes and then use the detrended version of the TUI as the regressor to re-estimate

equations (1) to (3). Table B.8, in the Appendix, exhibits the estimated results. The table shows that our findings are robust to considering the detrended version of the trade uncertainty indexes. Therefore, our results are not driven by a common trend affecting all trade uncertainty indexes simultaneously.

Third, to assess the sensitivity of our credit results to the way we implement the WLS regression and to our firm status definitions, we conduct the following checks: i) we temporally lag the country weights ω_{fct} ; ii) we temporally lag the foreign trade firm status S_{ft}^c ; iii) we consider alternative (current and one-period lagged) firm status specifications at the firm time level (disregarding the country dimension, that is, S_{ft} and S_{ft-1}). Importantly, our results are robust to the alternative weights and definitions described above. Results are available upon request.

5.2 The impact of TUI on trade growth

Before concluding, we investigate how trade uncertainty influences Chilean firms' foreign trade operations. In particular, we investigate whether the reaction of trade firms to periods of high trade uncertainty depends on how foreign trade is financed. In addition, we examine whether Chilean firms can substitute among products and/or countries (of origin or destination) when trade uncertainty augments. To begin with, columns 1 and 3 in Table 8 report the estimates of the model specification in equation (10): Column one has as a dependent variable the export growth, whereas column three focuses on import growth. In turn, columns two and four in the same table exhibit the estimates of the model specification in equation (11), which add information on the mode the foreign trade operation is mainly financed. Similarly, column two has export growth as the dependent variable, whereas column four focuses on import growth.

Focusing first on exporters, Table 8 shows that, overall, periods of high trade uncertainty lead to a significant decrease in export growth (column one of this table). Furthermore, when distinguishing by the mode with which exports are mainly financed (column two), we find that the reduction in export growth under periods of increasing trade uncertainty is mainly explained by the decrease of exports financed by cash-in-advance and by trade credit. This is because the estimated marginal effects of the destination-specific trade uncertainty index when exports are financed by cash-in-advance or trade credit modes (as the main financing modes of exports) are negative. In contrast, the estimated marginal effect of destination-specific TUI when the exports are mainly financed by

Table 8: Marginal effects of the country-specific trade uncertainty indexes on export/import growth distinguishing by payment type (payment in advance, trade credit, and bank credit)

	(1)	(2)	(3)	(4)
	Exports	Exports	Imports	Imports
$TUI_{c,t}$	-0.031** (0.015)		0.019 (0.015)	
Payment in advance		-0.087** (0.038)		0.051** (0.022)
Trade credit		-0.026* (0.015)		0.008 (0.015)
Bank credit		0.028 (0.051)		0.097* (0.056)
Firm-product-country FE	Yes	Yes	Yes	Yes
Firm-product-quarter FE	Yes	Yes	Yes	Yes
Product-country-year FE	Yes	Yes	Yes	Yes
Obs.	213,784	213,784	515,528	515,528
R^2	0.714	0.714	0.751	0.752
Adjusted- R^2	0.506	0.506	0.411	0.411

This table shows the marginal effects of the country-specific trade uncertainty indexes on export/import growth distinguishing by payment type. The marginal effects result from the estimation of equations (10) and (11). The dependent variables are the annual growth rates of exports or imports; they are winsorized at the one percent level. Weights are the shares of the trade value of a firm f with a country c in quarter t in the overall trade value of that firm during that quarter. Hence, each firm-quarter observation sums one. To measure payment type, we build a categorical value that takes the value of zero if the operation is mostly financed by cash, one if mostly with trade credit, and two with bank credit. Standard errors are in parentheses. Errors are clustered at the firm-quarter level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

bank credit is non-significant. Interestingly, the latter finding is consistent with the estimates for credit outcomes (Table 2), where we find that there is a non-significant marginal impact of trade uncertainty on the new loan amounts granted to exporters when trade uncertainty increases.

Intuitively, the finding that exports mainly financed by cash-in-advance or by trade credit grow less under periods of increasing trade uncertainty in the destination country is consistent with the working capital channel. Intuitively, to finance the time gap between production and sale revenues, firms need funding (Niepmann and Schmidt-Eisenlohr, 2017b). Indeed, with cash-in-advance (trade credit), Chilean exporters (importers in foreign markets) receive credit from importers (Chilean exporters), as the latter pay in advance for the goods and services they will receive later (provide credit by producing the product the importer demands without receiving any payment). However, under periods of increasing trade uncertainty, the financial conditions of importers buying goods and services from Chilean firms deteriorate, thus being less willing (or unable) to finance their imports with cash (Ellingsen and Vlachos, 2009; Schmidt-Eisenlohr, 2013; Hoefele et al., 2016). Similarly, Chilean exporters may prefer not to export to foreign firms established in countries with increasing trade uncertainty relying on trade credit. As a result, Chilean firms' working capital is damaged, provided there is no significant improvement in the banks' credit provision to these firms. Indeed Table 2 shows that loan amounts to trade firms exporting to countries with increasing trade uncertainty do not increase under periods of trade uncertainty. The above effects combined result in firms exporting less, as Table 8 documents.

In the case of imports, Table 8 (third and fourth columns of results) reveals that, overall, there is no significant impact of trade uncertainty on import growth. However, when distinguishing by the way imports are financed (column four in the same table), we find that, under periods of increasing trade uncertainty, import growth is higher when imports are financed by cash-in-advance or by bank credit. Results hence indicate that to overcome the increasing trade uncertainty in the foreign country from where Chilean firms import, Chilean importers (and hence Chilean banks) provide credit to the foreign firms by paying with cash-in-advance or by relying on bank credit.¹⁵

¹⁵ As a robustness check, we augment the model specifications in equations (10) and (11) by interacting the firm size with the categorical variable registering whether the foreign trade operation is mainly financed by payment-in-advance, trade credit, or bank credit. The intuition is that the propensity to use a specific payment mode may depend on the capacity of the firm to grant trade credit or access to bank loans. Results are globally consistent with the ones reported in Table 8. The estimates of this robustness check are available from the authors upon request.

Finally, to examine whether Chilean trade firms can substitute between countries (of destination or origin, when corresponding) and/or products when trade uncertainty increases, Table D.1 and Table D.2, in the Appendix, estimate equations (10) and (11) for export and import growth, respectively, allowing for various weighting schemes. Specifically, the first two columns of results in each table, respectively, exhibit the estimates of equations (10) and (11) relying on country weights (these estimates are the same as in Table 8, and included for comparison). The next two columns in each table use product weights; finally, the last two columns in each table do not consider weights.

Starting with export growth, Table D.1 shows that, in the aggregate, increasing trade uncertainty dampens export growth regardless of the weighting scheme we use for estimation (columns one, three, and five in the table). However, when comparing the results with different weights, we do find differences in the marginal effects of TUI when exports are mainly financed by cash. Indeed, Table D.1 suggests that Chilean exporters may substitute among destination countries and/or products when TUI augments, provided their exports are mainly financed by cash. This is because the marginal impacts of TUI on export growth in the specifications with product weights and without weights are statistically insignificant when exports are mainly financed by cash (in contrast to the corresponding negative estimated marginal impact of TUI when using country weights). We conclude that prepayment (cash in advance) provides flexibility to Chilean exporters to do some country and/or product substitution as a way to mitigate the effects of increasing trade uncertainty on their foreign trade activities.¹⁶

In contrast, the estimated marginal impacts of TUI on export growth are similar across estimations (that is, regardless of the weighting scheme, Table D.1) when exports are mainly financed by trade credit. This is hence indicating that Chilean firms have difficulties (or are not willing to) substitute among destination countries or products when their exports are mainly financed by trade credit (trade credit is also the main financing mode of exports, as Table B.3 shows). The way we interpret this finding is that trade credit is a more stable source of funding for exporters implying longer-term relations between trade firms; it is also the main financing mode of exports accounting for more than 80% (Table B.3). In line with our findings, Schmidt-Eisenlohr (2013) show that switches between payment modes are costly and that, unless the change in financing costs or contract enforcement is high, exporters prefer to keep the same payment contract and only adjust prices and quantities.

¹⁶ Recall that estimates in Table D.1 include product-country-year fixed effects to measure unobserved heterogeneity in the product-country foreign trade transactions, which may evolve through time. These dummies hence capture, for example, changes in export/import prices. Therefore, we believe that our approach is useful to measure country and/or product substitution.

Focusing now on import growth as the dependent variable, Table D.2 shows, first, that in the aggregate, increases in TUI do not damage import expansions. Second, when distinguishing among the main financing mode of imports, we find that imports increase with trade uncertainty when they are mainly financed by cash regardless of the weighting scheme. Hence, this indicates that to mitigate the negative impact of growing trade uncertainty in foreign markets, Chilean importers are more likely to prepay their imports. Third, when imports are mainly financed by bank credit, we find differences in the marginal impacts of TUI on import growth depending on the weighting scheme. Indeed, the marginal impact of TUI becomes statistically insignificant in the estimates without weights or with product weights. We conclude from the latter that Chilean importers (in addition to prepayment) may substitute among products and/or countries of origin for their imports when trade uncertainty increases and provided their imports are mainly financed by bank credit. Therefore, bank credit provides Chilean importers some additional degrees of flexibility to (do product and/or country substitution and, this way) mitigate the negative effects of trade uncertainty expansions on their foreign trade operations.

Summing up, there are two main conclusions to extract from the results above. First, increasing trade uncertainty in foreign countries has a differential impact on exports and imports. Second, the reactions of exporters and importers to higher trade uncertainty depend on how the foreign trade operations are financed. In the case of exports, our results are consistent with the working capital channel, according to which exporters' working capital deteriorates when TUI augments, especially when exports are mainly financed by trade credit. In addition, we provide evidence consistent with country and/or product substitution of Chilean exports when trade uncertainty increases and exports are mainly financed by cash. In the case of imports, increasing trade uncertainty in foreign markets results in Chilean firms (and banks) providing finance to foreign firms more intensively to compensate for the deterioration of the trade conditions in foreign markets.

5.2.1 Robustness checks

As a robustness check, we examine whether the preferred payment mode of exports or imports may be endogenous (due to simultaneity), which in turn would bias the estimated transmission of trade uncertainty to trade growth. To address this point, we follow an instrumental variable approach. Specifically, we instrument the main payment mode of each observation (at product-firm-country-quarter level) using its

most recent temporal lag available (over the previous four quarters). Intuitively, the preferred payment mode of a given product used in the past is likely to be related to the current main payment mode (for the same combination of product, country, and firm), but it should not directly influence foreign trade at the current quarter t .

Table E.1, in the Appendix, exhibits the results. Overall, estimates accounting for the possible endogeneity of the preferred payment mode are broadly consistent with our baseline results in Table 8. Therefore, we conclude that our estimates are not subject to any bias due to the endogeneity of the payment mode.

6 Conclusions

In this paper, we exploit the exogenous variations of destination/origin-specific trade uncertainty indexes to identify the effect of rising trade uncertainty on banks' credit provision to Chilean firms and on firms' foreign trade performance. For the study, we have access to a proprietary, confidential dataset of all new loan transactions of Chilean banks and their balance sheet information, combined with all foreign-trade operations of Chilean firms. We consider the period from January 2012 to March 2019. To measure trade uncertainty, we rely on text-based measures from [Ahir et al. \(2022\)](#) encompassing actual changes and the uncertainty arising due to threats of changes to tariff and non-tariff measures. In addition, the fact that Chile is a small, open emerging-market economy makes trade uncertainty abroad exogenous to Chilean firms. At the same time, the diversity of trade partners and sectors makes the case of Chile an ideal laboratory to explore this topic.

Our results show that under elevated trade uncertainty, there is a reallocation of bank credit from non-trade firms towards GVCs and importers. In the case of GVCs, our results suggest that banks may regard them as less risky (compared to exporters), as they tend to be larger and more productive, with balance sheets that are likely to be better hedged. At the same time, given their business models, GVCs are considerably exposed to developed economies, with these countries exhibiting increasing trade uncertainty over the period of 2016 to 2018. Moreover, we find that higher trade uncertainty is associated with lower export growth, particularly if exports are paid in advance or with trade credit to the importer firm abroad. Furthermore, imports grow more with increases in trade uncertainty if these are paid in advance or through bank credit. These results are consistent with a working capital channel for the transmission of trade uncertainty shocks.

Finally, we conclude that our findings do not support the hypothesis of greater international fragmentation due to increasing trade uncertainty, at least for Chile. We show that trade uncertainty in the short term (and when protectionist measures are far from being implemented on a large scale) leads to a reallocation of bank credit between firms and to smaller export growth. However, in the aggregate, trade growth may not necessarily be negative following increasing trade uncertainty. However, the future possible implementation of policies preventing trade liberalization and encouraging protectionism on a large scale could certainly be an important trigger for real and financial fragmentation.

Our paper is subject to two main shortcomings, due to data limitations. One of them is the measurement of firms' sizes, which requires information on sales (or the number of employees, for instance), which we do not observe. We approach this issue by separating pure exporters and pure importers from GVCs and by measuring firm size with total loan amounts. A second caveat relates to the fact that firms do not demand and obtain new loans continuously from banks. Hence, new loan registries do not feature continuous observations for the same firm. This prevents us from including firm-time fixed effects and from controlling for other factors at the firm level, which are often used in credit registries. We have addressed this issue by including fairly granular sector-time fixed effects as in [Degryse et al. \(2019\)](#), which proxy for credit demand factors.

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Appendix

A Additional Figures

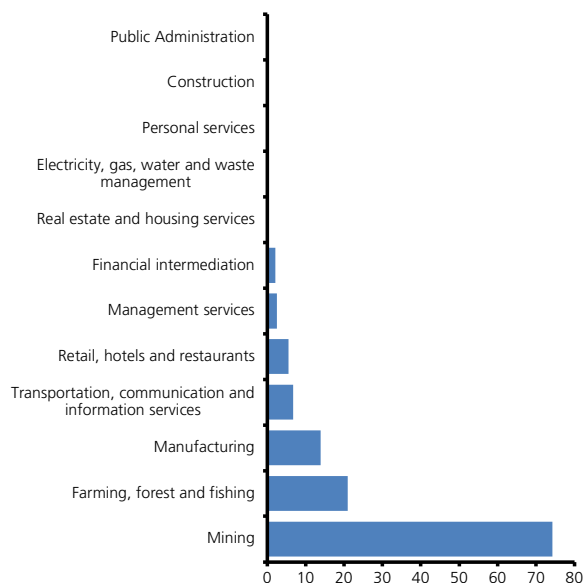


Figure A.1: Export intensity by sectors, according to the Chilean National Accounts' sector classifications. Export intensity is measured as the sector-specific ratio between exports and total output. The figure exhibits averages between 2013 and 2018. Source: Banco Central de Chile.

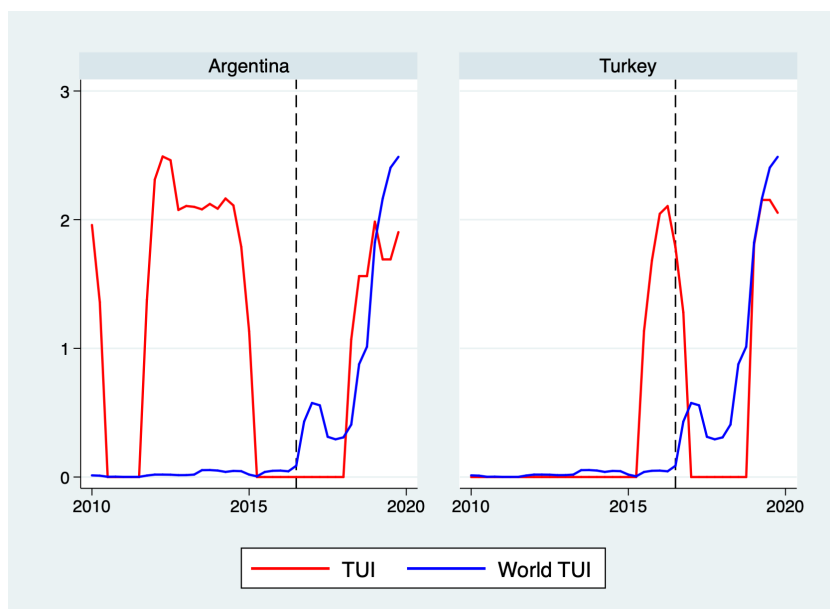


Figure A.2: Selected economies with high above median trade uncertainty indexes before the beginning of the 2016-2018 period characterized by rising trade uncertainty. The indexes are shown as 3-quarter average and are rescaled as the logarithm of one plus TUI. The World TUI is the GDP-weighted average of the country indexes.

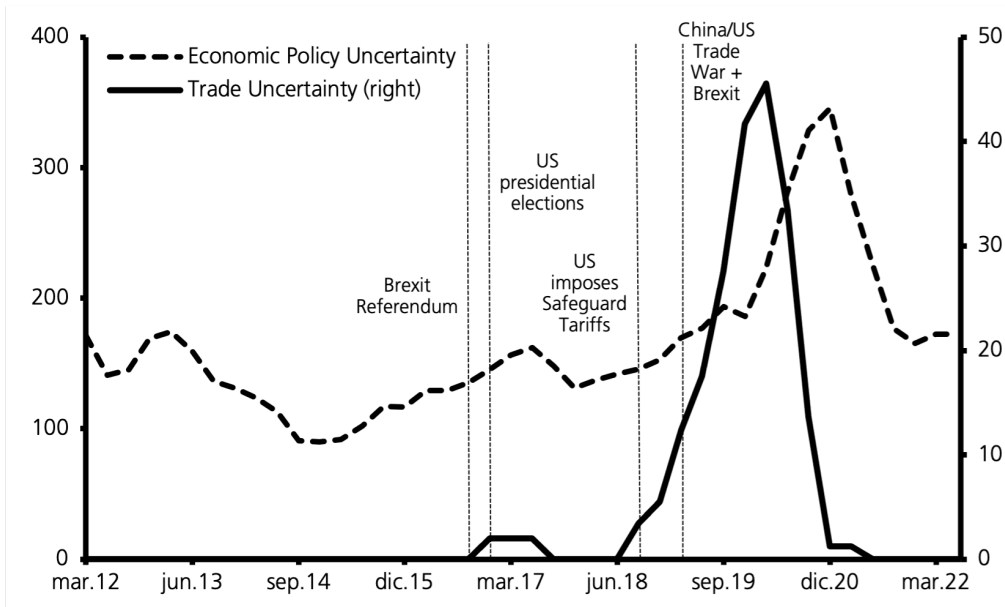


Figure A.3: United States. Economic Policy Uncertainty and Trade Uncertainty indexes. Economic Policy Uncertainty comes from www.policyuncertainty.com. The Trade Uncertainty Index comes from (Ahir et al., 2022). Indices have been re-scaled to make them comparable.

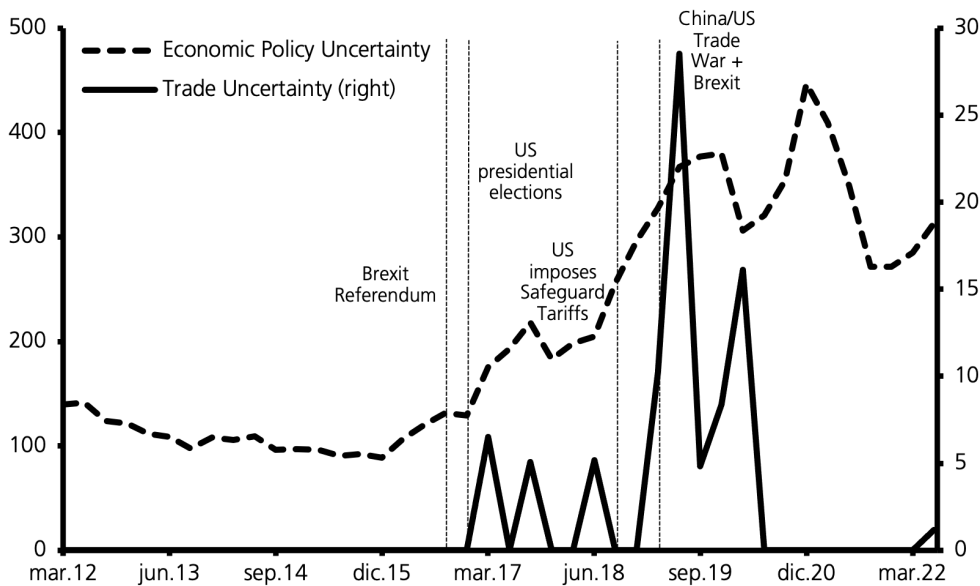


Figure A.4: China. Economic Policy Uncertainty and Trade Uncertainty indexes. Economic Policy Uncertainty comes from www.policyuncertainty.com. The Trade Uncertainty Index comes from (Ahir et al., 2022). Indices have been re-scaled to make them comparable.

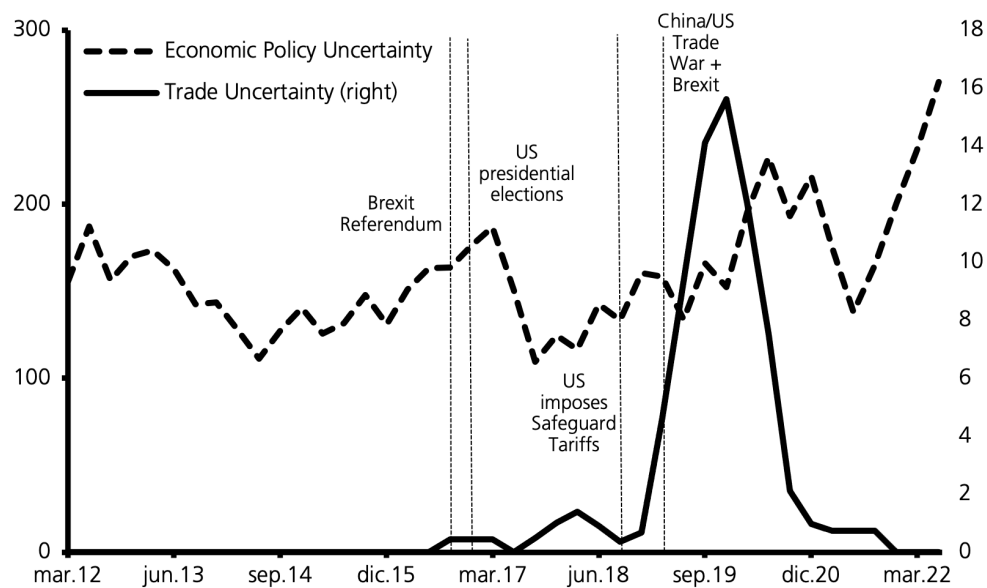


Figure A.5: European Union. Economic Policy Uncertainty and Trade Uncertainty indexes. Economic Policy Uncertainty comes from www.policyuncertainty.com. The Trade Uncertainty Index comes from (Ahir et al., 2022). Indices have been re-scaled to make them comparable.

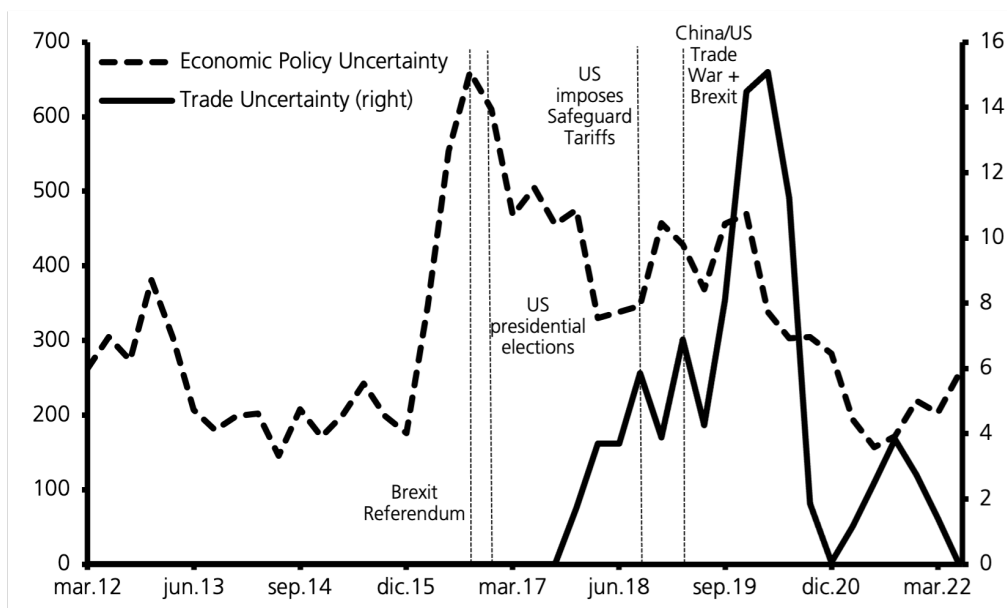


Figure A.6: United Kingdom. Economic Policy Uncertainty and Trade Uncertainty indexes. Economic Policy Uncertainty comes from www.policyuncertainty.com. The Trade Uncertainty Index comes from (Ahir et al., 2022). Indices have been re-scaled to make them comparable.

B Additional Tables

Table B.1: Summary statistics of the loan registry data

	Loan characteristics	Mean	Std. Dev.	Median	90th percentile
All firms	Amount (USD mn.)	0.7	7.1	0.1	1.0
	Term (months)	3.2	10.7	0.0	6.1
	Interest rate (%)	10.7	6.9	9.3	19.6
Firms without foreign trade	Amount (USD mn.)	0.3	3.1	0.1	0.4
	Term (months)	4.2	13.2	0.0	12.0
	Interest rate (%)	13.9	7.0	12.7	22.3
Firms with foreign trade	Amount (USD mn.)	1.1	9.1	0.2	1.8
	Term (months)	2.3	8.2	0.0	5.9
	Interest rate (%)	8.1	5.6	6.9	15.5

Source: Banco Central de Chile and Comisión de Mercados Financieros. Data sample: 2012Q2-2019Q1. A term of zero months indicates loans with maturity of less than 30 days.

Table B.2: Summary statistics of banks' characteristics

Bank variable	Mean	Std. Dev.	Median	90th percentile
Liquid assets to total assets (%)	14.1	6.3	12.1	24.2
NPL ratio (%)	1.0	0.5	0.9	1.6
Capital ratio (%)	13.2	4.0	13.3	14.1
Loan to assets (%)	76.0	6.2	77.2	82.4
FX liabilities to total liabilities (%)	19.2	5.8	18.9	24.3
Assets (USD mn.)	39,527	17,480	46,148	57,041

Source: Banco Central de Chile and Comisión de Mercados Financieros. Data sample: 2012Q1-2019Q1.

Table B.3: Share of trade financed by a given payment type

	Simple average			Value-weighted average		
	Exports	Import	Trade	Exports	Import	Trade
Cash	0.12	0.32	0.29	0.02	0.12	0.07
Trade credit	0.86	0.62	0.66	0.85	0.78	0.82
Bank credit	0.02	0.06	0.05	0.13	0.09	0.12
Obs.	310,398	1,644,144	1,953,783	310,398	1,644,144	1,953,783

The averages are calculated on the firm-product-country-time level observations, which will denominate as trade operation. The simple average is the average share of the trade operation financed by a given payment type. The weighted average indicates the average share of the total trade value in the sample financed by a given payment type.

Table B.4: Number of countries by trade category and firm's trade value size

	Mean	St. Dev.	p25	p50	p75	Min.	Max.	Obs.
Exports:								
Small	1.5	1.0	1	1	2	1	16	31,858
Large	6.1	7.2	2	4	8	1	79	48,201
Imports:								
Small	1.4	0.8	1	1	2	1	12	131,948
Large	3.8	4.2	1	2	5	1	45	173,603
Foreign trade:								
Small	1.5	0.9	1	1	2	1	14	146,719
Large	4.9	5.8	1	3	6	1	80	189,144

This table shows summary statistics of the number of countries a firm trades within a given quarter. A firm is considered to have a large trade value size if, on average, its trade value is in the upper tertile.

B.1 Robustness checks on the effects of trade uncertainty on credit outcomes

Table B.5: Impact of the country-specific trade uncertainty indexes on new loan amounts, distinguishing by type of product and firm status

	(1) Commercial	(2) Foreign trade	(3) Development
Estimated coefficients:			
TUI_{ct}	-0.006*** (0.001)	0.007 (0.007)	-0.004*** (0.001)
$TUI_{ct} \times \text{Status}_{fct} = 1$	-0.019* (0.011)	-0.037** (0.015)	-0.008 (0.019)
$TUI_{ct} \times \text{Status}_{fct} = 2$	0.016* (0.008)	0.001 (0.011)	0.042* (0.025)
$TUI_{ct} \times \text{Status}_{fct} = 3$	0.003 (0.003)	-0.021* (0.012)	0.010* (0.006)
$TUI_{ct} \times \text{Status}_{fct} = 4$	0.012*** (0.003)	-0.012 (0.008)	0.018*** (0.006)
$TUI_{ct} \times \text{Status}_{fct} = 5$	0.002 (0.008)	-0.018 (0.016)	0.010 (0.019)
$TUI_{ct} \times \text{Status}_{fct} = 6$	0.013*** (0.003)	-0.007 (0.007)	0.018** (0.008)
Marginal effects of TUI_{ct} at:			
$\text{Status}_{fct} = 0$	-0.006*** (0.001)	0.007 (0.007)	-0.004*** (0.001)
$\text{Status}_{fct} = 1$	-0.025** (0.011)	-0.030** (0.013)	-0.012 (0.018)
$\text{Status}_{fct} = 2$	0.010 (0.008)	0.008 (0.009)	0.038 (0.025)
$\text{Status}_{fct} = 3$	-0.003 (0.003)	-0.015 (0.010)	0.006 (0.006)
$\text{Status}_{fct} = 4$	0.006** (0.002)	-0.005 (0.004)	0.014** (0.006)
$\text{Status}_{fct} = 5$	-0.004 (0.008)	-0.011 (0.014)	0.005 (0.019)
$\text{Status}_{fct} = 6$	0.007*** (0.002)	0.000 (0.002)	0.014* (0.008)
Firm-bank-country FE	Yes	Yes	Yes
Sector-quarter FE	Yes	Yes	Yes
Bank-quarter FE	Yes	Yes	Yes
Obs.	2,546,304	484,595	441,738
R^2	0.815	0.805	0.796
Adjusted- R^2	0.772	0.773	0.709

This table shows the estimates of equation (1). The dependent variable is the logarithm of the loan amounts distinguishing by commercial, foreign-trade, and development loans. The foreign-trade status of the firms is a categorical variable of value 0 if the firm only trades domestically; 1 if the firm only exports but has not exported to the country c during the last four quarters and 2 if it has; 3 and 4 are analogous to 1 and 2, but for firms that only import; 5 and 6 are also analogous to 1 and 2 but for GVC firms. Marginal effects are calculated as the sum of the coefficients on TUI_{ct} and its interaction with the status variable. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.6: Impact of the country-specific trade uncertainty indexes on new loan interest rates, distinguishing by type of product and firm status

	(1) Commercial	(2) Foreign trade	(3) Development
Estimated coefficients:			
TUI_{ct}	-0.037*** (0.004)	-0.030** (0.014)	0.006 (0.004)
$TUI_{ct} \times \text{Status}_{fct} = 1$	0.091** (0.040)	0.037 (0.031)	0.116 (0.081)
$TUI_{ct} \times \text{Status}_{fct} = 2$	0.134*** (0.039)	0.052** (0.022)	-0.084 (0.065)
$TUI_{ct} \times \text{Status}_{fct} = 3$	0.010 (0.012)	0.002 (0.022)	-0.039* (0.022)
$TUI_{ct} \times \text{Status}_{fct} = 4$	0.046*** (0.010)	0.025 (0.016)	-0.038 (0.025)
$TUI_{ct} \times \text{Status}_{fct} = 5$	-0.048* (0.028)	0.021 (0.025)	0.156*** (0.059)
$TUI_{ct} \times \text{Status}_{fct} = 6$	0.131*** (0.009)	0.051*** (0.015)	0.043* (0.026)
Marginal coefficients of TUI_{ct} at:			
$\text{Status}_{fct} = 0$	-0.037*** (0.004)	-0.030** (0.014)	0.006 (0.004)
$\text{Status}_{fct} = 1$	0.054 (0.039)	0.008 (0.027)	0.122 (0.080)
$\text{Status}_{fct} = 2$	0.097** (0.039)	0.022 (0.017)	-0.079 (0.065)
$\text{Status}_{fct} = 3$	-0.028*** (0.010)	-0.028* (0.016)	-0.034 (0.021)
$\text{Status}_{fct} = 4$	0.008 (0.009)	-0.004 (0.008)	-0.033 (0.024)
$\text{Status}_{fct} = 5$	-0.085*** (0.027)	-0.009 (0.020)	0.162*** (0.058)
$\text{Status}_{fct} = 6$	0.093*** (0.007)	0.021*** (0.004)	0.049* (0.025)
Firm-bank-country FE	Yes	Yes	Yes
Sector-quarter FE	Yes	Yes	Yes
Bank-quarter FE	Yes	Yes	Yes
Obs.	2,546,304	484,595	441,738
R^2	0.818	0.752	0.882
Adjusted- R^2	0.776	0.711	0.832

This table shows the estimates of equation (2). The dependent variable is the annualized interest rates of new commercial, foreign trade, and development loans. The foreign-trade status of the firms is a categorical variable of value 0 if the firm only trades domestically; 1 if the firm only exports but has not exported to the country c during the last four quarters and 2 if it has; 3 and 4 are analogous to 1 and 2, but for firms that only import; 5 and 6 are also analogous to 1 and 2 but for GVC firms. Marginal effects are calculated as the sum of the coefficients on TUI_{ct} and its interaction with the status variable. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.7: Impact of the country-specific trade uncertainty indexes on new loans maturity, distinguishing by type of product and firm status

	(1) Commercial	(2) Foreign trade	(3) Development
Estimated coefficients:			
TUI_{ct}	-0.005*** (0.001)	-0.013** (0.005)	-0.002* (0.001)
$TUI_{ct} \times \text{Status}_{fct} = 1$	0.004 (0.010)	0.016 (0.017)	-0.003 (0.025)
$TUI_{ct} \times \text{Status}_{fct} = 2$	0.011 (0.010)	0.021** (0.009)	0.020 (0.021)
$TUI_{ct} \times \text{Status}_{fct} = 3$	0.007** (0.003)	0.018** (0.008)	0.010 (0.007)
$TUI_{ct} \times \text{Status}_{fct} = 4$	0.010*** (0.003)	0.022*** (0.006)	0.011 (0.007)
$TUI_{ct} \times \text{Status}_{fct} = 5$	0.016** (0.007)	0.025* (0.013)	-0.015 (0.027)
$TUI_{ct} \times \text{Status}_{fct} = 6$	0.010*** (0.002)	0.013** (0.006)	0.012 (0.008)
Marginal coefficients of TUI_{ct} at:			
$\text{Status}_{fct} = 0$	-0.005*** (0.001)	-0.013** (0.005)	-0.002* (0.001)
$\text{Status}_{fct} = 1$	-0.002 (0.010)	0.003 (0.016)	-0.005 (0.025)
$\text{Status}_{fct} = 2$	0.006 (0.010)	0.007 (0.007)	0.017 (0.021)
$\text{Status}_{fct} = 3$	0.002 (0.003)	0.005 (0.006)	0.008 (0.006)
$\text{Status}_{fct} = 4$	0.005** (0.002)	0.008*** (0.002)	0.009 (0.007)
$\text{Status}_{fct} = 5$	0.011 (0.007)	0.011 (0.012)	-0.017 (0.027)
$\text{Status}_{fct} = 6$	0.005** (0.002)	-0.000 (0.002)	0.010 (0.008)
Firm-bank-country FE	Yes	Yes	Yes
Sector-quarter FE	Yes	Yes	Yes
Bank-quarter FE	Yes	Yes	Yes
Obs.	2,546,304	484,595	441,738
R^2	0.609	0.592	0.719
Adjusted- R^2	0.517	0.525	0.599

This table shows the estimates of equation (3). The dependent variable is the logarithm of the maturity of the new commercial, foreign trade, and development loans. The foreign-trade status of the firms is a categorical variable of value 0 if the firm only trades domestically; 1 if the firm only exports but has not exported to the country c during the last four quarters and 2 if it has; 3 and 4 are analogous to 1 and 2, but for firms that only import; 5 and 6 are also analogous to 1 and 2 but for GVC firms. Marginal effects are calculated as the sum of the coefficients on TUI_{ct} and its interaction with the status variable. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B.8: Impact of country-specific detrended trade uncertainty indexes on credit outcomes distinguishing among firms' foreign trade statuses

	(1) Amount All	(2) Amount LC	(3) Int. Rate All	(4) Int. Rate LC	(5) Maturity All	(6) Maturity LC
Estimated coefficients						
TUI_{ct}	-0.005*** (0.001)	-0.003*** (0.001)	-0.036*** (0.004)	0.004 (0.003)	-0.005*** (0.001)	-0.003*** (0.001)
$Status_{fct} = 1 \times TUI_{ct}$	-0.023** (0.011)	-0.019 (0.012)	0.111*** (0.040)	0.071 (0.044)	0.001 (0.010)	0.006 (0.011)
$Status_{fct} = 2 \times TUI_{ct}$	0.019** (0.009)	0.030 (0.019)	0.111*** (0.041)	-0.021 (0.089)	0.014 (0.012)	0.042 (0.025)
$Status_{fct} = 3 \times TUI_{ct}$	-0.001 (0.003)	0.001 (0.003)	0.028** (0.012)	0.024** (0.012)	0.007** (0.003)	0.007** (0.003)
$Status_{fct} = 4 \times TUI_{ct}$	0.010*** (0.003)	0.014*** (0.004)	0.027** (0.011)	-0.025* (0.013)	0.010*** (0.003)	0.008** (0.004)
$Status_{fct} = 5 \times TUI_{ct}$	-0.015* (0.008)	-0.009 (0.009)	0.016 (0.030)	0.005 (0.034)	0.010 (0.008)	0.010 (0.008)
$Status_{fct} = 6 \times TUI_{ct}$	0.011*** (0.003)	0.006* (0.004)	0.108*** (0.008)	-0.028** (0.011)	0.009*** (0.003)	0.012*** (0.004)
Marginal effect of TUI_{ct} at:						
$Status_{fct} = 0$	-0.005*** (0.001)	-0.003*** (0.001)	-0.036*** (0.004)	0.004 (0.003)	-0.005*** (0.001)	-0.003*** (0.001)
$Status_{fct} = 1$	-0.027** (0.011)	-0.021* (0.012)	0.075* (0.039)	0.075* (0.044)	-0.003 (0.010)	0.003 (0.011)
$Status_{fct} = 2$	0.015 (0.009)	0.027 (0.019)	0.076* (0.040)	-0.017 (0.088)	0.009 (0.012)	0.038 (0.025)
$Status_{fct} = 3$	-0.005* (0.003)	-0.001 (0.003)	-0.008 (0.010)	0.028*** (0.010)	0.002 (0.003)	0.003 (0.003)
$Status_{fct} = 4$	0.006** (0.003)	0.011*** (0.003)	-0.009 (0.010)	-0.021* (0.012)	0.005* (0.003)	0.005 (0.004)
$Status_{fct} = 5$	-0.019** (0.008)	-0.011 (0.009)	-0.020 (0.029)	0.009 (0.034)	0.005 (0.007)	0.007 (0.008)
$Status_{fct} = 6$	0.006** (0.002)	0.004 (0.003)	0.072*** (0.007)	-0.025** (0.010)	0.004* (0.002)	0.009*** (0.003)
Firm-Bank-Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank-Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	2,562,792	1,996,289	2,562,792	1,996,289	2,562,792	1,996,289
R^2	0.816	0.823	0.819	0.808	0.609	0.647
Adjusted- R^2	0.773	0.776	0.777	0.757	0.517	0.552

This table exhibits the estimates of equations (1), (2), and (3), controlling for the foreign-trade status of the firm. Alternative dependent variables are the logarithm of the loan amounts, annualized interest rates, and the logarithm of the maturity of the new loans granted. The foreign-trade status of the firms is a categorical variable of value 0 if the firm only trades domestically; 1 if the firm only exports but has not exported to the country c during the last four quarters and 2 if it has; 3 and 4 are analogous to 1 and 2, but for firms that only import; 5 and 6 are also analogous to 1 and 2 but for GVC firms. Marginal effects are calculated as the sum of the coefficients on TUI_{ct} and its interaction with the status variable. Weights correspond to the share of the firm's trade with country c on its total trade. For firms without international trade, a weight of 0.2 is assigned to each observation. Standard errors are in parentheses. Errors are clustered at the firm-bank level. LC stands for local currency and Int. Rate for interest rates
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

C Bank credit supply and demand analysis

Data come from the proprietary database of the Banking Credit Survey (BCS) conducted quarterly by the Central Bank of Chile since 2003. Banks' officers respond whether their banks are easing or tightening their credit standards. They also answer if they observe a higher or lower credit demand. The debtor categories are large firms, small firms, and construction firms. We focus on the first two, as they are the focus of this paper.

The variables measuring the demand and supply conditions in BCS are diffusion indices with categorical variables from -1 to 1 in 0.5 increments. The value -1 indicates tightening supply conditions (decreasing demand), -0.5 some tightening (decrease), 0 no change, 0.5 some easing (increase), and 1 easing conditions (increasing demand).

We conduct seemingly unrelated regression equations (SURE), using as dependent variables the bank officers' responses about the bank supply and demand:

$$R_{b(c)t}^S = \beta^S TUI_{ct} + \gamma^S X_{b,t-1} + \alpha_{fc}^S + \delta_t^S + \epsilon_{b(c)t}^S \quad (12)$$

$$R_{b(c)t}^D = \beta^D TUI_{ct} + \gamma^D X_{b,t-1} + \alpha_{fc}^D + \delta_t^D + \epsilon_{b(c)t}^D \quad (13)$$

where R indicates the response of the bank officer working for bank b at period t on the credit supply S and demand D . The regressions are stacked on the country (or region) c dimension, as in the benchmark model specification, to ensure comparability. The weights used are the share of a country c total trade of firm f borrowing from bank b , and are calculated as follows:

$$\omega_{bct} = \frac{\sum_{f \in \mathcal{F}_{bt}} T_{fct}}{\sum_{f \in \mathcal{F}_{bt}} \sum_{k \in \mathcal{C}_{ft}} T_{fkt}} \quad (14)$$

First, we estimate a set of SURE for large firms, second for small firms, and finally, for both categories simultaneously.

Table C.1: Effect of country-specific trade indexes on credit supply and demand conditions

	(1)		(2)		(3) Overall			
	Large		Small		Large		Small	
	Offer	Demand	Offer	Demand	Offer	Demand	Offer	Demand
$TUI_{c,t}$	0.001 (0.005)	-0.000 (0.009)	0.000 (0.006)	0.002 (0.008)	0.000 (0.005)	0.002 (0.009)	0.000 (0.006)	0.002 (0.008)
Obs.	2,252	2,253	1,893	1,894	1,893	1,894	1,895	1,896
F test	8.58	14.33	7.18	10.78	7.64	7.18	14.77	10.78
Breusch-Pagan test	35.61		142.37		902.25			
Bank-country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table shows the effects of the country-specific trade uncertainty indexes on the bank credit offer and demand conditions using seemingly unrelated regression estimation. The effects result from the estimation of equations Equation (12) and Equation (13). Weights correspond to the shares of the trade value of country c in quarter t in the overall trade value of the firms in the bank's portfolio. F-tests and Breusch-Pagan tests of correlated equation errors are significant at the 1% level. Robust standard errors are in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

D Effects of trade uncertainty on trade growth under alternative weighting schemes

Table D.1: Marginal effects of the country-specific trade uncertainty indexes on export growth distinguishing by payment type (payment in advance, trade credit, and bank credit), using alternative weighting schemes

	(1)	(2)	(3)	(4)	(5)	(6)
Weights	Country	Country	Product	Product	None	None
$TUI_{c,t}$	-0.031** (0.015)		-0.026** (0.011)		-0.022** (0.010)	
Payment in advance		-0.087** (0.038)		-0.016 (0.033)		-0.027 (0.029)
Trade credit		-0.026* (0.015)		-0.028** (0.011)		-0.022** (0.010)
Bank credit		0.028 (0.051)		0.025 (0.044)		0.011 (0.039)
Firm-product-country	Yes	Yes	Yes	Yes	Yes	Yes
Firm-product-quarter	Yes	Yes	Yes	Yes	Yes	Yes
Product-country-year	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	213,784	213,784	213,784	213,784	213,784	213,784
R^2	0.714	0.714	0.445	0.445	0.487	0.487
Adjusted- R^2	0.506	0.506	0.041	0.042	0.113	0.114

This table shows the marginal effects of the country-specific trade uncertainty indexes on export/import growth distinguishing by payment type. The marginal effects result from the estimation of Equation (10) and Equation (11). The dependent variables are the annual growth rates of exports or imports; they are winsorized at the one percent level. Weight schemes are the following. First, "Country" indicates the share of the country c in the trade value of a firm f in quarter t . Second, "Product" indicates the share of the product p in the trade value of a firm f in quarter t . And third, uniform weights are used. Hence, each firm-quarter observation sums one. To measure payment type, we build a categorical value that takes the value of zero if the operation is mostly financed by cash, one if mostly with trade credit, and two with bank credit. Standard errors are in parentheses. Errors are clustered at the firm-quarter level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table D.2: Marginal effects of the country-specific trade uncertainty indexes on import growth distinguishing by payment type (payment in advance, trade credit, and bank credit), using alternative weighting schemes

	(1)	(2)	(3)	(4)	(5)	(6)
Weights	Country	Country	Product	Product	None	None
$TUI_{c,t}$	0.019 (0.015)		0.032** (0.016)		0.006 (0.012)	
Payment in advance		0.051** (0.022)		0.078*** (0.025)		0.035** (0.018)
Trade credit		0.008 (0.015)		0.016 (0.016)		-0.002 (0.012)
Bank credit		0.097* (0.056)		0.079 (0.058)		0.062 (0.044)
Firm-product-country	Yes	Yes	Yes	Yes	Yes	Yes
Firm-product-quarter	Yes	Yes	Yes	Yes	Yes	Yes
Product-country-year	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	515,528	515,528	515,528	515,528	515,528	515,528
R^2	0.751	0.752	0.579	0.581	0.549	0.549
Adjusted- R^2	0.411	0.411	0.004	0.007	-0.070	-0.068

This table shows the marginal effects of the country-specific trade uncertainty indexes on export/import growth distinguishing by payment type. The marginal effects result from the estimation of equations Equation (10) and Equation (11). The dependent variables are the annual growth rates of exports or imports; they are winsorized at the one percent level. Weight schemes are the following. First, "Country" indicates the share of the country c in the trade value of a firm f in quarter t . Second, "Product" indicates the share of the product p in the trade value of a firm f in quarter t . And third, uniform weights are used. Hence, each firm-quarter observation sums one. To measure payment type, we build a categorical value that takes the value of zero if the operation is mostly financed by cash, one if mostly with trade credit, and two with bank credit. Standard errors are in parentheses. Errors are clustered at the firm-quarter level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

E Trade uncertainty effects on trade growth, instrumental variables approach

As a robustness check, we implement an IV approach. The instrument corresponds to the most recent available lag of F_{fpct} during the previous 4 quarters. Formally, this is

$$F_{fpct}^{IV} = \min_{\tau} \{F_{fpc,t-\tau}\}_{\tau=1}^{\tau=4} \text{ if } \exists \tau \text{ such that } \{F_{fpc,t-\tau}\}_{\tau=1}^{\tau=4} \neq \emptyset \quad (15)$$

Intuitively, the main payment mode previously used affects trade growth at current quarter t only through its influence on the payment type chosen at t .

Table E.1: Marginal effects of the country-specific trade uncertainty indexes on export/import growth distinguishing by payment type (payment in advance, trade credit, and bank credit): instrumental variable approach

	(1)	(2)
	Exports	Imports
Cash	-0.148*** (0.045)	0.004 (0.028)
Trade credit	-0.026* (0.013)	0.015 (0.010)
Bank credit	0.065 (0.075)	0.107** (0.042)
Firm-product-country FE	Yes	Yes
Firm-product-quarter FE	Yes	Yes
Product-country-year FE	Yes	Yes
Obs.	213,784	515,528
F-Test	6.250	2.543
F-Test p-value	0.000	0.026
Anderson LM-stat.	3.862**	25.107***
Anderson-Rubin F-test	3.484***	1.989*
Anderson-Rubin χ^2 -test	17.733***	10.086**
Stock-Wright S stat.	17.731***	10.086**

This table shows the marginal effects of the country-specific trade uncertainty indexes on export/import growth distinguishing by payment type. The instrumental variables correspond to the latest available lag during the previous four quarters. The marginal effects result from the estimation of Equation (10) and Equation (11). The dependent variables are the annual growth rates of exports or imports; they are winsorized at the one percent level. Weights are the shares of the trade value of a firm f with a country c in quarter t in the overall trade value of that firm during that quarter. Hence, each firm-quarter observation sums one. To measure payment type, we build a categorical value that takes the value of zero if the operation is mostly financed by cash, one if mostly with trade credit, and two with bank credit. Standard errors are in parentheses. Errors are clustered at the firm-quarter level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.