DOCUMENTOS DE TRABAJO

Navigating trade uncertainty: The role of trade financing and the spillover effects.

Mauricio Calani
Paula Margaretic
David Moreno

N° 1027 Octubre 2024
BANCO CENTRAL DE CHILE

banco central Chile

Documentos de Trabajo del Banco Central de Chile
Working Papers of the Central Bank of Chile
Agustinas 1180, Santiago, Chile
Teléfono: (56-2) 3882475; Fax: (56-2) 38822311

Documento de Trabajo N° 1027

Working Paper N° 1027

Navigating trade uncertainty: The role of trade financing and the spillover effects*

Mauricio Calani
Banco Central de Chile

Paula Margaretic
Universidad de Chile, FEN

David Moreno
Banco Central de Chile

Resumen

Este trabajo utiliza los cambios exógenos de la incertidumbre comercial (IC), específica a cada país de destino/origen, para investigar efectos directos e indirectos de la IC sobre las operaciones de comercio internacional de las empresas y de crédito bancario otorgado. Utilizando datos a nivel de transacciones entre empresas y bancos chilenos, primero, se muestra que el aumento de la IC perjudica el crecimiento de las exportaciones a través del deterioro del capital de trabajo de las empresas. Esto es especialmente cierto cuando las exportaciones son financiadas principalmente con pago por adelantado, un modo de pago que conlleva relaciones comerciales más cortas y menos permanentes entre las empresas. Segundo, se encuentra que los aumentos de la IC inducen una redistribución del crédito bancario desde empresas más pequeñas hacia grandes importadores y empresas involucradas en cadenas globales de valor. Nuestros resultados son consistentes con un canal de mitigación de riesgos de los bancos que otorgan préstamos en mayores montos a empresas que son percibidas como relativamente menos riesgosas durante periodos de altas tensiones comerciales. De esta forma, las perturbaciones de IC se transmiten hacia otras empresas no afectadas inicialmente por la IC, a través del mercado del crédito bancario.

Abstract

This paper exploits the exogenous changes of destination/origin-specific trade uncertainty (TU) to investigate the direct and spillover effects of TU on firms' foreign-trade operations and credit outcomes. Using transaction-level data of Chilean firms and banks, we first show that increasing TU dampens export growth through a deterioration of firms' working capital. This is especially true when exports are mainly financed by cash-in-advance, a payment mode that entails shorter and less permanent relationships between firms. Second, we find that increases in TU induce a bank-firm portfolio redistribution away from small firms toward large importers and firms involved in the global value chain (GVC). Our results are consistent with a risk-mitigating channel from banks that grant larger loans to firms that are perceived as relatively less risky during periods of high trade tensions. This way, TU shocks spill over to other firms not initially affected by TU through the bank credit market.

*We thank useful discussions from Camila Casas and Hans Degryse, comments by Eugenia Andreasen, Pol Antràs, Alejandro Bernales, Alejandro Jara, David Kohn, Claudio Raddatz, Verónica Rappoport, Patricio Toro, Carlos Perez, Rodrigo Wagner, and the participants at the IBRN Fragmentation Initiative, NBER Conference on International Fragmentation, Supply Chains, and Financial Frictions, the 6th CEPR Endless Summer Conference on Financial Intermediation and Corporate Finance, and 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 expressed are those of the author and do not necessarily reflect the views of the Central Bank of Chile or its board members. This study was developed within the scope of the research agenda conducted by the Central Bank of Chile (CBC) in economic and financial affairs of its competence. The CBC has access to anonymized information from various public and private entities, by virtue of collaboration agreements signed with these institutions. To secure the privacy of workers and firms, the CBC mandates that the development, extraction and publication of the results should not allow the identification, directly or indirectly, of natural or legal persons. Officials of the Central Bank of Chile processed the disaggregated data. All the analysis was implemented by the authors and did not involve nor compromise Servicio Nacional de Aduanas or Comisión para el Mercado Financiero.
Corresponding Author: pmargareti@fen.uchile.cl. Universidad de Chile, Facultad de Economía y Negocios

1 Introduction

Since mid 1980, 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 since 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 uncertainty[2] may affect the prospects of firms trading with those countries exhibiting this feature. Moreover, banks can react to these trade uncertainty shocks by tightening credit conditions and/or reallocating credit across firms. More generally, these growing trade uncertainties have been considered by some academics as indicators of a more general de-globalization or international fragmentation process (for a discussion, see Antràs, 2020).

This paper exploits the exogenous changes in destination/origin-specific Trade Uncertainty Indexes (TUI) to investigate how TU affects international trade activity at the firm level, as well as their bank credit outcomes, emphasizing the linkages between trade, trade finance, and bank credit during periods of increasing uncertainty. In particular, we aim to answer the following research questions. How does trade uncertainty affect firms' international trade operations? Is this effect mitigated/amplified by how firms finance these operations? and finally; does TU affect bank credit provision across firms? Answering these questions allows us to shed some light on whether rising TU is likely to affect only firms' foreign-trade activities or, oppositely, it can spill over to other firms, thus impacting the real economy, with the banking sector transmitting these TU shocks across firms.

Our case study is Chile, an open emerging-market economy with inflation targeting and a floating exchange rate regime. Chile is a globalized economy, with 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

[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 a tightening of non-tariff measures that augment uncertainty; second, increased uncertainty regarding the future path of tariff and non-tariff barriers to trade due to policymakers' discussions; and finally, changes in outstanding trade agreements, which lead to further trade uncertainty.

[3] The 70 markets with which Chile has trade agreements represent 88% of the world's gross domestic product (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.

administrative credit registry —we observe all new loans granted by banks to non-financial corporations—, the National Customs —which contains the universe of Chilean exports and imports, including how firms finance them—, and banks' balance sheets. 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 TUI are exogenous from the point of view of Chilean firms and banks. Second, thanks to the detail of our customs dataset, we can quantify firms' exposures to increasing TU and their adjustment, in terms of foreign-trade operations. Third, 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 TU.[4] Our time frame extends over the period between January 2012 and March 2019. To measure TU, 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 demonstrate that trade uncertainty affects exports and imports differently. Moreover, the manner in which foreign-trade operations are financed, shapes the reaction of trade firms to TU. Precisely, in the case of exports, we show that TU dampens export growth in the aggregate, and when exports are mainly financed by cash-in-advance. These results are consistent with a working capital channel: trade uncertainty deteriorates the financial conditions of foreign importers in countries exhibiting an increment of it. As a result, these firms become less willing (or unable) to pay for their imports of Chilean products with cash. Also, cash-in-advance is the payment mode that implies shorter-term relations between firms; hence, foreign firms in countries with high TU may find it easier to reduce those imports (of Chilean products) that are financed by cash. To a lesser extent, Chilean exporters also react to the increase in TU in foreign markets by reducing the exports that 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 latter).

[4] 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. 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 which are in the loan portfolio of that bank.

In contrast, in the case of imports, we find that imports grow more with trade uncertainty in the origin country if they are mainly financed by cash-in-advance or by bank credit. Intuitively, Chilean importers purchasing goods from countries with high trade uncertainty who are able to prepay their imports through cash-in-advance or bank credit can mitigate the shortage of funding affecting their foreign counterparty, and expand their trade activity.

When distinguishing between global value chains (i.e. firms that have exported and imported intermediate goods over the last year, henceforth GVCs) and net exporters or importers, we document that GVCs in Chile are the ones whose reaction to trade uncertainty is the largest. This makes sense when we consider that these firms trade considerably with the countries or regions exhibiting the largest increases in trade uncertainty in the recent past, namely China, the U.S., the U.K, and the European Union. Indeed, these central economies represent, on average, 54% of the international trade of the GVCs; they are large and very much connected to international markets.[5]

Interestingly, in the case of imports, we show that the reaction of GVCs importing from countries with rising trade uncertainty is greater when their imports are financed by bank credit (compared to the effect of trade uncertainty on imports financed with cash-in-advance). This finding relates to previous literature (Niepmann and Schmidt-Eisenlohr, 2017a) showing that firms use bank credit more intensively and are less willing to trade without it when they trade with riskier markets and/or when uncertainty is high. Summing up, we conclude from the above that the way foreign-trade operations are financed does shape the reaction of trade firms to rising TU and also that GVCs are the most affected by the rise in trade uncertainty in the recent past.

Complementing the previous analysis, we examine the reaction of export and import prices to TU shocks. We find as before, dissimilar patterns, which crucially depend on the way operations are financed and on the type of firm. In the case of export prices, we show evidence consistent with GVCs transferring the expected increase in export costs due to the rise in TU to the trading counterparts with whom they have less stable trading relations, that is, those paying cash-in-advance. Intuitively, this may be reflective of the higher bargaining power of GVCs (Antràs, 2020). In the case of import prices, non-GVC firms react to the rise in TU in foreign markets by prepaying their

[5] Interestingly for our analysis, previous studies (Antràs and Chor, 2022; Bernard et al., 2007, 2009; Kasahara and Lapham, 2013; Antràs, 2020) 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; they are more likely to trade more intensively with developed economies; and they have significant bargaining power relative to their suppliers.

imports with bank credit at higher import prices. In contrast, GVCs show lower import prices when TU in the foreign market rises and when the GVC has a more permanent trading relation with its counterpart (in the form of trade credit). This is again in line with the higher bargaining power interpretation of these firms.

Next, we investigate whether banks can transmit the trade uncertainty shocks affecting trading firms to other firms not directly hit by the shock.[6] We show that during periods of high TU, bank credit redistributes from non-trading firms toward GVCs and importers who trade with firms in countries exhibiting increasing trade uncertainty. In contrast, the new loans granted to exporters affected by the increasing TU do not expand, but the interest rates do. Furthermore, we document a crowding-out effect from small firms toward larger GVCs and importers that are exposed to rising trade uncertainty.[7]

Intuitively, during periods of high trade uncertainty, trade firms in affected countries become financially constrained and, as such, demand more credit from their domestic counterparties. Our results indicate that domestic banks expand their lending to firms that provide some of this larger demand, these firms are mainly GVCs and importers (compared to exporters). In the case of GVCs, banks may perceive them as entailing smaller risks because they are larger and they export and import at the same time; therefore, are likely to be better naturally hedged. In regard to importers, banks may perceive them as relatively less risky because TU affects them through a reduction in the credit they receive from foreign firms. Indeed, as explained above, we document that importers are more likely to prepay their imports or rely more on bank credit when TU augments.[8] 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 during periods of high trade uncertainty.

[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, as well as firm-bank-country fixed effects. Following Paravisini et al. (2021), we interpret the bank credit estimates as bank-firm equilibrium credit outcomes.

[7] 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 TU rises are the reflection of changes in the aggregate supply and/or demand for credit or rather, they are due to a redistribution of credit among firms. Results show that TU does not significantly affect the aggregate credit supply and/or demand conditions, thus providing support for the redistribution interpretation.

[8] Consistent with this interpretation, Table B.1 in the Appendix examines 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 marginal impact of TU on the share of rescheduled credits is not positive regardless of the firm status.

On top of the above, the crowding-out effect we document, in favor of larger GVCs and importers, and in detriment of smaller firms is a novel result which adds to the literature, as studies typically focuses on the direct effects of trade policy uncertainty or tariff increases on the economy (Fajgelbaum and Khandelwal, 2022; Fajgelbaum et al., 2020; Amiti et al., 2019) and on the domestic credit markets (Correa et al., 2023).

Finally, we examine whether some banks' business model traits influence their decision to provide more credit during periods of high TU. We show that banks whose loan portfolios are specialized in the countries exhibiting affected by TU shocks, grant smaller loans with higher interest rates to their clients. Note however that specialized banks in Chile are small; also, they do not represent a large share of total credit to Chilean firms.

Wrapping up, this paper documents the significant interdependencies between trade finance and bank credit during periods of increasing trade uncertainty. Indeed, we find that higher trade uncertainty in the destination countries negatively affects exports in the aggregate, as well as when the exports are financed mainly by cash-in-advance. Our results on exports are consistent with 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 suggests that Chilean importers and banks are indeed financing foreign firms exposed to the increasing trade uncertainty in their own countries. Moreover, we show that increasing trade uncertainty leads to a redistribution of credit toward larger firms that are presumably perceived by banks as less risky.

We conclude that while the trade tensions observed during 2016-2018 resulted in a redistribution of domestic credit among different types of firms, our results do not support the hypothesis of increasing financial fragmentation due to growing trade uncertainty, as total credit to firms has not contracted. This conclusion is also valid when we consider real fragmentation. This is because we document that total exports grow less when trade uncertainty rises, but there is no significant effect of increasing TU on total imports. 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 (due, for example, to the implementation of policies that stall liberalization and encourage protectionism, or to growing geopolitical risks) 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., 2021), 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 firms' foreign-trade operations and the spillover effects of these demand shocks to other firms — not initially affected by the shock — through the bank credit markets. To our knowledge, no previous study has documented the spillover effects of increasing trade uncertainty through credit market. Our result that increasing TU leads to a credit redistribution is consistent with risk management 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 small non-trade firms). Furthermore, we provide evidence of the significant interlinkages between trade, trade finance, and credit provision during periods of increasing trade uncertainty.

Secondly, our paper connects with the literature on the effects of trade policy on firms' performance (Graziano et al., 2021; Handley and Limão, 2017; Fajgelbaum et al., 2022) and domestic credit supply (Correa et al., 2023). In particular, Graziano et al. (2021) study the effect of Brexit on U.K. firms. In turn, Fajgelbaum et al. (2022) examine the trade wars between the U.S. and China in 2018 to show that they have led to large declines in U.S. exports and imports and an incomplete pass-through to prices. Interestingly, Correa et al. (2023) show that the 2018–2019 U.S trade war has led to a domestic credit contraction with real effects, where firms that borrowed from more exposed banks experienced lower debt growth andinvestment rates. We add to this literature by investigating the impact of trade uncertainty shocks (not only related to trade policy) in foreign markets on firms' foreign trade operations and their credit outcomes. We show that firms' reactions to increasing trade uncertainty in a foreign market depend on whether they are importing or exporting, and how these exports or imports are financed.

This paper is structured as follows. Section 2 documents some stylized facts on trade uncertainty. Section 3 presents the data, Section 4 introduces the empirical strategy. Section 5 exhibits results. First, the section investigates how trade uncertainty affects firms' foreign-trade performance by mode of financing. Second, it examines the spillover effects of trade uncertainty through the credit market. Third, it assesses whether trade

uncertainty affects the credit outcomes of firms differently depending on their characteristics; and finally, it explores the role of banks' business model traits in providing credit during periods of high trade uncertainty. Section 6 concludes with a discussion of the main findings of the paper.

2 Stylized facts on trade uncertainty

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 Economist Intelligence Unit (EIU) country report.[9] Therefore, the indexes capture not only actual changes in tariff and non-tariff measures but also the uncertainty arising from threats to 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, whether it is influenced by other economic factors, such as economic policy uncertainty (EPU) or exchange rates. To address this point, Figures A.2 to A.5 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 it clear that TUI and EPU exhibit different time patterns. We hence conclude that the TUI has specific informational content, thus providing support for 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, as well as between the United Kingdom with the European Union.[10] 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, see Figure A.6 in the Appendix), what is new

[9] The most common indexes used in the literature rely on text-searching related words in newspapers, 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.

[10] 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 the U.S. and China. Simultaneously, Brexit brought this issue to the European Union.

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 stylized fact motivates the present study, as we hypothesize that the growing trade uncertainty observed during the $2016 - 2018$ period in central economies would have large impacts in small open economies like Chile.

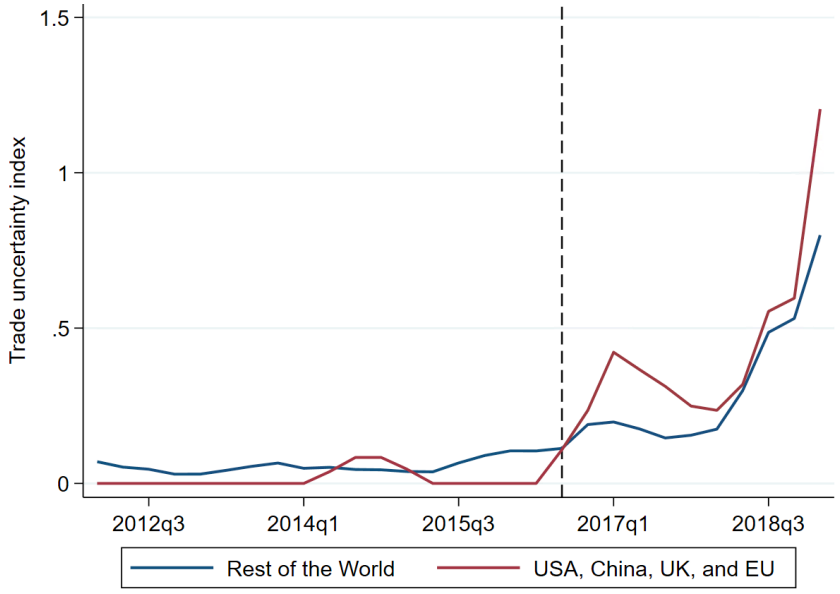

Figure 1: Evolution of the mean trade uncertainty index for different groups of countries: USA, China, UK, and EU versus Rest of the World. The index is rescaled to the logarithm of the index plus one.

3 Data

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

3.1 Credit 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'Ariccia 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 during periods of trade uncertainty, we also include the share of liabilities in foreign currency, whether the bank is related or is a subsidiary of a foreign bank, and the intensity of linkages between a resident bank in Chile and its related bank overseas (proxied by the gross cross-border positions). These data come from an administrative and confidential database at 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 imported goods 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, the transaction date, the freight-on-board value and volume of the merchandise, and the financing mode of the transaction. The data allows us to identify if each transaction was paid in advance (cash in advance, or CIA), post-shipment (trade credit, hereafter TC), or through financial institutions (such as letters of credit or two-part contracts, hereafter BC).

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 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, the tensions generated by changes in trade tariffs and non-tariff measures, and those driven by the uncertainty regarding the future evolution of trade linkages among countries.[11] Tables B.2, B.3, and B.4 in the Appendix exhibit the descriptive statistics of the data we consider in this paper. In addition, Table B.5, also in the Appendix, reports the share of trade financed by each payment type.

4 Methodology

4.1 The impact of trade uncertainty on firms

We start by investigating to what extent trade uncertainty affects firms trading with foreign markets. Precisely, we examine the following two questions: i) whether and to what extent changes in trade uncertainty impact foreign-trade operations; ii) whether the reactions of trading firms to periods of high trade uncertainty depend on the manner through which foreign trade is financed.

To answer the research questions above, first, we propose the following baseline model specification:

$$\Delta T_{fpct} = \alpha_{fpt} + \alpha_{pcy} + \alpha_{fpc} + \beta \Delta TUI_{ct} + \varepsilon_{fpct}. \quad (1)$$

[11] 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 dependent variable in equation (1) corresponds to the year-on-year quarterly changes of the logged trade values, with the trade values being the exports or the imports of product p traded by the firm f from/to country c in quarter t. We distinguish among 4464 product markets. Therefore, the model specification in equation (1) involves a firm-product-country-quarter panel. This is thanks to the richness and granularity of our customs data.

To account for firms' and foreign markets' heterogeneity, we saturate the model specification in equation (1) with a full set of fixed effects. Precisely, to capture firm-product specific shocks originating in narrowly defined foreign-trade markets, we add firm-product-quarter dummies, hereafter α_{fpt}. In turn, to account for unobserved heterogeneity across firms in the product-country foreign-trade transactions, which may evolve through time, we include product-country-year dummies, which we denote as α_{pcy}. The dummies α_{pcy} would capture, for example, considerable changes in relative prices of certain products or product demand shocks from country c. Finally, we include firm-product-country fixed effects, α_{fpc}, to capture the possibility that firms may specialize in certain products and/or countries because of higher productivity in a given segment.

Our variable of interest is the year-on-year quarterly changes in the destination/origin-specific trade uncertainty index for country c at quarter t (Ahir et al., 2022), which we denote as ΔTUI_{ct} in equation (1). The trade uncertainty measures are scaled by taking the logarithm of one plus the value of the index to preserve the observations with a value of zero; they are also averaged with a moving average of three periods. In particular, our interest is to capture significant spikes in trade uncertainty that are large enough to elicit responses from trade firms. To do so, we follow Bloom (2009) and Carrière-Swallow and Céspedes (2013) and consider trade uncertainty shocks as periods characterized by spikes in TUI, where the change in TUI surpasses its mean by more than 1 standard deviation.

Standard errors are clustered at the firm-product-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 weighted least square (WLS) regression using weights ω_{fct} defined as follows:

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

Second, to investigate whether the reaction of trade firms to trade uncertainty depends on the way foreign-trade operations are mainly financed, we augment the model specification in equation (1) as follows:

$$\Delta T_{fpct} = \alpha_{fpt} + \alpha_{pcy} + \alpha_{fpc} + \beta \Delta TUI_{ct} + \gamma F_{fpct} + \theta F_{fpct} \times \Delta TUI_{ct} + \varepsilon_{fpct}, \qquad (2)$$

where F_{fpct} is a categorical variable if the operation is financed mainly with payment in advance, trade credit, or bank credit. Therefore, the interaction term between the trade uncertainty index and the categorical variable F_{fpct} aims at capturing whether the payment mode of foreign-trade operations shapes the impact of trade uncertainty on firms' foreign-trade activities.

4.2 Spillover effects of trade uncertainty through credit market

4.2.1 Baseline model specification

Next, we investigate whether and to what extent banks can transmit trade uncertainty shocks through the financial system. Banks can spill over the trade uncertainty shock, for instance, by redistributing credit from non-trade firms toward trade firms directly impacted by the shock. Furthermore, if increasing trade uncertainty leads to a credit contraction for trade firms, followed by a reduction of credit to firms not initially affected by the trade uncertainty, we would conclude that banks amplify the initial negative shock to other firms through the credit market. Oppositely, banks could mitigate the trade uncertainty shock if the new loans granted to firms exposed to the shock increase with trade uncertainty without altering the amounts or the conditions of the new credits granted to firms not affected by the rise in trade uncertainty. To investigate the nature of these indirect or spillover effects, if any, we estimate the following model specification with stacked observations (to be detailed):

$$y_{fbt} = \alpha_{st} + \alpha_{bt} + \alpha_{fbc} + \beta TUI_{ct} + \gamma S^c_{ft} + \delta S^c_{ft} \times TUI_{ct} + \varepsilon_{fbct} \qquad (3)$$

The dependent variable y_{fbt} in equation (3) can represent three alternative variables. First, the logged amount of new credit granted by bank b to firm f in quarter t, hereafter ℓ_{fbt}. Second, the interest rate of the new loan granted by bank b to the firm f in quarter t, which we denote as r_{fbt}. Finally, the maturity of the new loan granted by bank b to firm f in quarter t, in logarithm, hereafter τ_{fbt}.[12]

[12] Note that the credit outcomes are in level, and not in differences as in the previous section, because they refer to the new credit granted by bank b to the firm f in quarter t.

Importantly, the model specification in equation (3) accounts for multiple country trading 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. This is a common limitation when using credit registry data because loans are recorded as being provided to firms, not firm-country pairs. Yet, even if the information were available, it is not clear that it should be preferred. This is because credit is fungible and can be used for other purposes than the stated loan objective.

To account for the nature of our loan-level data, we follow Paravisini et al. (2021) and 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 for credit outcomes (in contrast to the specifications of trade growth, which are not stacked).

Equation (3) isolates the bank-firm pair component of lending by using saturated regressions (Paravisini et al., 2021). 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 granular sector-time fixed effects (firms are classified into 160 sectors).[13]

In turn, the set of time-invariant firm-bank-country fixed effects in equation (3) , α_{fbc}, accounts for all unobserved heterogeneity in the firm-bank-country (or firm-bank-region) lending relationship. Importantly, Paravisini et al. (2021) show that by including bank-time and firm-time dummies simultaneously in the model specification (3) (in our case, we include sector-time dummies as explained above), the estimated loan amounts (ℓ_{fbt}) and the credit conditions (r_{fbt} and τ_{fbt}) correspond to bank-firm equilibrium outcomes. We follow this interpretation in the forthcoming analysis unless we explicitly state otherwise.

[13] The approach of using the 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.

Our variable of interest is the weighted moving average trade uncertainty index for the country (or region, when corresponding) c in quarter t, TUI_{ct} in equation (3). To compute the weighted moving average (weighted by GDP), we follow Ahir et al. (2022) and 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) net exporters, who have not exported to country (or region) c over the last four quarters; iii) net exporters, who have exported to country (or region) c; iv) net importers, who have not imported from the country (or region) c over the last four quarters; v) net importers, who have imported from the country (or region) c over the last four quarters;[14] vi) global value chains or GVCs, that is, firms that have both exported and imported intermediate goods 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 equation (3) allows us to examine whether trade uncertainty has affected differently those firms trading internationally *vis-à-vis* those that only trade locally. This analysis is important as it sheds light on whether there are spillover effects of the trade uncertainty shocks across firms through credit outcomes. The spillover effects would occur when increasing trade uncertainty impacts the new loans granted to firms not initially exposed to the rise of trade uncertainty (for instance, domestic firms). Finally, to account for the relative importance of a firm of a given country (or region) of destination/origin at a certain period, for estimation, we perform a 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 (depending on the firm's status). 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

[14] We would like to thank the Editor Shang-Jin Wei for suggesting this definition of GVC. The product classification we utilize to identify intermediate goods is the 4-digit Harmonized System code.

to each of the five destinations/origins at each firm-bank-country-quarter observation.[15] Finally, we cluster the standard errors at the firm-bank level, as is customary in this literature. Nevertheless, the to-be-presented results are robust to using alternative clustering criteria for the standard errors (for example, firm-country).

4.2.2 Firms' heterogeneity and credit outcomes

To further delve into the nature of the spillover effects of trade uncertainty through credit outcomes, we investigate whether increases in trade uncertainty affect certain types of firms differently. We distinguish firms in terms of two additional characteristics: 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). Next, we extend the model specification in equation (3) above as follows:

$$\begin{aligned} y_{fbt} =& \alpha_{st} + \alpha_{bt} + \alpha_{fbc} + \beta TUI_{ct} + \gamma S^c_{ft} + \delta_1 S^c_{ft} \times TUI_{ct} + \delta_2 S^c_{ft} \times 1_f \\ &+ \delta_3 S^c_{ft} \times TUI_{ct} \times 1_f + \varepsilon_{fbct} \end{aligned} \tag{4}$$

Equation (4) includes a triple interaction term among the firms' statuses, trade uncertainty and a 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).

4.2.3 Banks' heterogeneity and credit outcomes

Finally, to examine whether certain banks' business model traits influence the amount of credit provided and the credit conditions during periods of high trade uncertainty, we modify the model specification in equation (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, does not include the bank-time dummies α_{bt}. This is because they would otherwise absorb all the bank-time varying effects.

[15] Note that having a WLS regression combined with the information of firms' statuses is not redundant, as it is possible, for example, that a given firm is a pure exporter to more than one country and as such, it is exposed to more than one trade uncertainty change. The weights in the regression, therefore, allow us to quantify the relative importance of each destination/origin country for the firm's foreign trade.

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 and its controller or related foreign bank, and finally, the banks' specialization measure as defined in Paravisini et al. (2021). 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. (2021), we rely on the sum of exports and imports to a given foreign country.

To operationalize the study of the influence of the specific traits on the funding conditions granted by banks during periods of trade uncertainty, for the majority of the traits we interact, one at a time, a dummy variable that takes the value of one if the given business model trait is above its median (and zero if it is below) at the beginning of the period (that is, first quarter of 2012), 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 values above the median) because the specialization variable is already a dummy regressor. Likewise, in the case of the characteristic being a foreign bank, this is already a dummy variable.

The model specification that accounts for the influence of banks' business model traits on credit outcomes during periods of trade uncertainty becomes,

$$y_{fbt} = \alpha_{st} + \alpha_{fbc} + \beta TUI_{ct} + \gamma \mathbf{X}_{b,t-1} + \psi Z_{b,0} + \delta Z_{b,0} \times TUI_{ct} + \varepsilon_{fbct} \tag{5}$$

where $Z_{b,0}$ denotes the dummy variable for the business model trait under consideration.

5 Results

5.1 The impact of TU on firms' trade performance

First, we investigate how changes in TU affect firms' international trade activity. Then, we assess whether the manner in which trade is financed matters for how the adjustment of firms to periods of high trade uncertainty is done. In Table 1, columns one and two (three and four) consider export (import) growth as a dependent variable. Also, columns one and three in the same table use specification in equation (1), and columns two and four the specification in equation (2), which adds information on the mode of financing.

Table 1: Marginal effects of changes in country-specific TUIs on export/import growth distinguishing by payment type (payment in advance, trade credit, and bank credit)

	(1) Exports	(2) Exports	(3) Imports	(4) Imports
$\Delta TUI_{c,t}$	-0.024**		0.017	
	(0.010)		(0.011)	
Payment in advance		-0.056*		0.055***
		(0.029)		(0.020)
Trade Credit		-0.021**		0.005
		(0.011)		(0.011)
Bank credit		0.027		0.095**
		(0.044)		(0.039)
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	0.505	0.505	0.411	0.411

This table shows the marginal effects of changes in the country-specific trade uncertainty indexes on export/import growth distinguishing by payment type. The marginal effects result from the estimation of equations (1) and (2). 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 adds to 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-product-quarter level. $^{*}p < 0.10$,$^{**}p < 0.05$,$^{***}p < 0.01$.

The first most important conclusion to draw from Table 1 is that the way international trade is financed shapes the effect of trade uncertainty on firms' exports and imports. Intuitively, to finance the time gap between production and sale revenues, firms need funding (Niepmann and Schmidt-Eisenlohr, 2017b). Under cash-in-advance, Chilean exporters receive credit from foreign importers, as the latter pay in advance for the goods they will receive at a later date. Likewise, under trade credit, Chilean exporters provide credit to foreign importers, by incurring in financing production and shipment before payment.

Starting with export growth, our results show that increasing trade uncertainty negatively impacts export growth in the aggregate (column one) and when exports are mainly paid in advance, or with trade credit (column two). Conversely, the marginal effect of TUI is positive but non-significant when exports are financed with bank credit. By comparing the marginal effects of TUI for cash-in-advance and trade credit, column two in Table 1 suggests that when TU in destination country augments, firms in such countries may find it easier to reduce their imports when these are paid upfront. This is consistent with the evidence that cash-in-advance is the payment mode that

entails shorter and less permanent commercial relations between firms (Ellingsen and Vlachos, 2009; Schmidt-Eisenlohr, 2013; Hoefele et al., 2016) and that as exporters and importers establish a relationship through repeated interactions, transactions are less likely to occur in cash-in-advance in favor of trade credit (Antràs and Foley, 2015).[16]

In contrast, trade credit is a more stable source of funding for firms implying longer-term relations among them. Note that in Chile, trade credit is also the main financing mode for exports, accounting for more than 80% of total exports (see Table B.5). 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.[17]

In the case of imports, column three in Table 1 reveals that, on average, there is no significant impact of trade uncertainty on import growth. However, when distinguishing by how imports are financed (column four in the same table), we find that during periods of increasing trade uncertainty, imports grow more when they are financed with cash-in-advance or with bank credit. Intuitively, to manage the higher risk due to growing trade uncertainty in the foreign market from where Chilean firms import goods, Chilean importers react by prepaying their imports (with cash) or by relying on bank credit from Chilean banks. Furthermore, by comparing the marginal effects in Table 1, we find that when TU augments, the increase in imports financed by bank credit is larger compared to the marginal impact of trade uncertainty on imports' growth financed by cash-in-advance.

To delve into the study of the impact of trade uncertainty on firms, we now augment the model specifications in equations (1) and (2) by including a triple interaction term between the trade uncertainty index, the categorical variable registering the main payment mode of the foreign-trade operation, and a dummy variable that indicates whether the firm is GVC or not. Note that since the dependent variables are export and import growth, the interaction term with the dummy variable for GVCs results in firms being distinguished as GVCs, net exporters or net importers, depending on the dependent variable.

[16] Interesting for our analysis, Antràs and Foley (2015) show that during the 2007-2009 global financial crisis, foreign sales to customers that were trading with cash-in-advance experienced the largest declines.

[17] Supporting our interpretation and in line with Schmidt-Eisenlohr (2013)'s result, Table B.6 in the Appendix examines whether increasing trade uncertainty affects the probability of changing the choice of the main payment mode of exports and imports (extensive margin). The analysis indicates that trade uncertainty does not significantly affect the probability of changing a given payment mode.

To understand the implications of this analysis, it is important to mention that GVCs in our sample are larger and trade considerably with the countries exhibiting the greatest increases in trade uncertainty in the recent past, namely China, the U.S., the U.K., and the European Union (compared to non-GVCs trading firms). In this regard, these central economies represent, on average, 53.8% of the international trade of our GVCs during the period 2012-2019. Investigating the special characteristics of GVCs, previous studies (Antràs and Chor, 2022; Bernard et al., 2007, 2009; Kasahara and Lapham, 2013; Antràs, 2020) have shown that GVCs are larger and more productive than exporters or importers; they trade a larger share of their outputs and inputs; they are more likely to trade more intensively with developed economies; and they have more bargaining power vis-à-vis their suppliers. Distinguishing between GVCs and not GVCs is appealing as it allows us to examine whether trade uncertainty affects larger and more connected firms differently compared to its impact on smaller ones. We hence hypothesize that the impact of TU on GVCs' foreign-trade operations would be different, compared to the expected impact of TU on net-exporters' or net-importers' foreign-trade operations.

Table 2: Marginal effects of changes in country-specific TUIs on export/import growth distinguishing by payment type (payment in advance, trade credit, and bank credit) and firm status

	(1) Exports	(2) Exports	(3) Imports	(4) Imports
Non-GVC firms	-0.011		0.017	
	(0.014)		(0.014)	
Non-GVC firms paying in advance		-0.008		0.050**
		(0.048)		(0.024)
Non-GVC firms with trade credit		-0.014		0.003
		(0.015)		(0.015)
Non-GVC firms with bank credit		0.131**		0.077*
		(0.061)		(0.045)
GVC firms	-0.033***		0.017	
	(0.013)		(0.013)	
GVC firms paying in advance		-0.077**		0.064**
		(0.036)		(0.030)
GVC firms with trade credit		-0.026*		0.006
		(0.013)		(0.014)
GVC firms with bank credit		-0.061		0.128**
		(0.056)		(0.065)
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 and firm status. The marginal effects result from the estimation of equations (1) and (2) with one modification, which is that we include a triple interaction term among the trade uncertainty index, the payment mode, and also, the firm status. 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 adds to 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-product-quarter level. $^{*}p < 0.10, ^{**}p < 0.05, ^{***}p < 0.01$.

Table 2 confirms our previous hypothesis as it shows that the largest impacts of trade uncertainty on firms' foreign-trade operations occur for GVCs, both in the aggregate in the case of exports and when we distinguish by the payment mode of exports and imports. Precisely, in the case of exports, we find that GVCs in Chile export less to destination countries with increasing TU when the foreign buyer finances the operation by paying upfront.

In the case of imports, Table 2 shows that GVCs' imports from origin countries with higher trade uncertainty grow more if the importer finances the operation using bank credit or paying in advance, with the effect being stronger when GVCs' imports are financed by bank credit. This suggests that because GVCs in Chile are larger and more connected to foreign partners, they may have more capacity to get bank funding to finance their foreign-trade operations.

Without distinguishing between GVCs or non-GVC firms, Niepmann and Schmidt-Eisenlohr (2017a) show that firms use bank credit more intensively and are less willing to trade without it when they trade with riskier markets —in our case, these would be the foreign markets exhibiting the rise in TU— and when economic uncertainty is high. Moreover, Niepmann and Schmidt-Eisenlohr (2017a) document a non-linear relation between the payment mode of foreign-trade operations and risk. Banks providing credit to trade firms can help firms manage risk, but not completely eliminate it. Indeed, the interest rates banks charge increase with the risk they take on. However, when the risk is too large, banks' fees are so high that exporters prefer cash-in-advance. In that case, the importer needs to pay before the exporter produces the goods to fully eliminate risk. While explicitly testing the pecking order of payment modes in Niepmann and Schmidt-Eisenlohr (2017a) is out of the scope of this paper, their findings enrich the interpretation of our results in Table 2.[18] We will re-examine this interpretation when presenting the results of increasing trade uncertainty on credit outcomes, distinguishing by firms' foreign-trade statuses.

In the case of non-GVC firms, we find that exports grow more when they are mainly financed with bank credit. This finding contrasts with the aggregate results thus implying that the results we observe in Table 1 are mainly driven by the behavior of GVCs, and more precisely by firms who are paid in advance and to a lesser extent, to those that give trade credit. Conversely, the impact of TU on imports for non-GVC firms aligns with the aggregate results and those of GVC firms.

Summing up, there are three main findings so far. First, higher TU in destination/origin countries affects differently exports and imports. This asymmetric impact is presumably reflecting the different financial frictions that exporters and importers face when trade uncertainty rises. Second, the reactions of exporters and importers to higher TU depend on how international trade operations are financed. In the case of exports, our results are consistent with a working capital channel, according to which firms' working capital deteriorates when trade uncertainty augments. In turn, this would lead to foreign firms

[18] Under Niepmann and Schmidt-Eisenlohr (2017a)'s lenses, we could interpret our results as indicating that the risk Chilean firms face is moderate, which in turn would explain why banks provide credit more intensively to GVCs importing from countries with increasing trade uncertainty.

reducing their purchases of Chilean products in cash. In the case of imports, increasing trade uncertainty results in Chilean importers (and banks) financing foreign exporters in countries with rising trade uncertainty more intensively. Finally, the largest impacts of TU on firms' international trade operations occur for GVCs. This is a novel and intuitive finding when we consider that these firms are larger and more exposed to the rise in TU. In the second part of the paper (Section 5.2), we investigate whether TU shocks in certain foreign markets spill over to the rest of the economy through the credit market.

5.1.1 Examining the impact of TU on export/import prices

Two follow-up questions arising from the results in Table 1 and Table 2 concern how export/import prices react to TU and whether the previously presented results are solely influenced by price changes rather than trade quantities. To address these questions, we use data on quantities involved in each foreign trade transaction. We calculate the average price per transaction by dividing the value of the foreign trade operation conducted by firm f for product p traded from/to country c in quarter t with the corresponding quantity. However, it is important to note that using the quantity attribute in our dataset introduces some missing observations, resulting in a smaller number of observations for the price analysis compared to the baseline estimates in Table 1 and Table 2. Tables 3 and 4 present the estimates using the model specifications in equations (1) and (2), with the only difference being that the dependent variable is our measure of export or import price change, as appropriate.

There are several conclusions to draw from this analysis. First, our results are not solely influenced by mere changes in export or import prices. On the contrary, trade uncertainty shocks have real effects on the quantities that Chilean firms export and/or import. These effects, in turn, depend on the main financing methods of these foreign trade operations, as shown in Table 1 and Table 2. A way to observe this is by comparing the significance of coefficients in Tables 1 and 3. This comparison highlights that the significant marginal effects found in Table 1 are not driven by those in Table 3.

Table 3: Marginal effects of changes in country-specific TUIs on export/import prices growth distinguishing by payment type (payment in advance, trade credit, and bank credit)

	(1) Exports	(2) Exports	(3) Imports	(4) Imports
$\Delta TUIc,t$	0.005		-0.001	
	(0.005)		(0.008)	
Payment in advance		0.047**		0.013
		(0.019)		(0.014)
Trade Credit		-0.001		-0.006
		(0.004)		(0.008)
Bank credit		0.013		0.024
		(0.015)		(0.024)
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.	169,633	169,633	454,680	454,680
R^2	0.761	0.761	0.734	0.734
Adjusted R^2	0.586	0.586	0.371	0.371

This table shows the marginal effects of changes in country-specific trade uncertainty indexes on export/import growth prices distinguishing by payment type. The marginal effects result from the estimation of equations (1) and (2). The dependent variables are the annual growth rates of export or import prices; 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 adds to 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-product-quarter level level. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

Table 4: Marginal effects of changes in country-specific TUIs on export/import growth prices distinguishing by payment type (payment in advance, trade credit, and bank credit) and firm status

	(1) Exports	(2) Exports	(3) Imports	(4) Imports
Non-GVC firms	-0.009		0.024**	
	(0.006)		(0.010)	
Non-GVC firms paying in advance		-0.014		0.017
		(0.017)		(0.017)
Non-GVC firms with trade credit		-0.009*		0.026**
		(0.005)		(0.011)
Non-GVC firms with bank credit		0.003		0.051**
		(0.021)		(0.026)
GVC firms	0.012*		-0.022**	
	(0.006)		(0.010)	
GVC firms paying in advance		0.070***		0.016
		(0.025)		(0.022)
GVC firms with trade credit		0.003		-0.029***
		(0.006)		(0.010)
GVC firms with bank credit		0.016		-0.012
		(0.019)		(0.042)
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.	169,633	169,633	454,680	454,680
R^2	0.761	0.761	0.734	0.734
Adjusted R^2	0.586	0.586	0.371	0.371

This table shows the marginal effects of changes in country-specific trade uncertainty indexes on export/import growth prices distinguishing by payment type. The marginal effects result from the estimation of equations (1) and (2) with one modification, which is that we include a triple interaction term among the trade uncertainty index, the payment mode, and also, the firm status. The dependent variables are the annual growth rates of export or import prices; 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 adds to 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-product-quarter level. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

Second, Table 4, column two (bottom panel), shows that when trade uncertainty rises, the increase in export prices is significant for GVCs in Chile that receive finance from foreign importers located in countries experiencing the trade uncertainty shock (that is, under cash-in-advance terms). Conversely, this effect is not prevalent when Chilean exports of GVCs are financed with trade credit or when the operation involves non-GVC firms. Intuitively, cash-in-advance is the payment mode that involves less permanent trading relations. In addition, due to their larger scale, GVCs are expected to have more bargaining power in their commercial relationship (Antràs, 2020). Combining

these elements, we interpret the positive marginal effect of TUI when exports are mainly financed with cash-in-advance as reflective of GVCs transferring the increase in export (expected) costs due to the rise in trade uncertainty to the trading counterparts with whom they have less stable trading relations.

In contrast, when exports are primarily financed with trade credit, results in Table 4, column two (top panel), suggest that non-GVC firms may be absorbing part of the higher costs due to the rise in trade uncertainty in destination markets. This result is consistent with the argument that these firms —in particular those using trade credit— are likely to have less bargaining power than GVCs who get paid in advance, and thus absorb some of the higher expected cost of trade.

Third, in the case of imports, Table 4, column four, shows that the reaction of import prices to trade uncertainty shocks crucially depends on financing method and on GVC status. Interestingly, we find that non-GVC firms react to the rise in TU in foreign markets by prepaying their imports with bank credit at higher import prices. Moreover, the positive marginal effect for TUI when imports are mainly financed with trade credit indicates that to receive credit from exporters in foreign markets exposed to TU shocks, non-GVC firms need to pay higher import prices. What is interesting from our results is that this effect is prevalent mainly for non-GVC firms. In contrast, GVCs may be bargaining for lower import prices when TU in the foreign market from which they are importing rises and when the GVC has a more permanent trading relation with its counterpart (in the form of trade credit), as Table 4 (column four, bottom panel) documents. This again relates to the higher bargaining power interpretation of these firms (Antràs, 2020).

In summary, trade uncertainty shocks imply higher costs due to the effective and expected rise in tariffs and international trade restrictions, in general (Georgieva, 2023). Our analysis shows that who pays these increasing costs depends on two main features. First, the financial frictions that firms in international trade face, which, in turn, determine how their foreign trade activity is financed. Additionally, firm characteristics such as size, complexity and bargaining power, which, in our estimates, leads to the distinction between GVCs and non-GVC firms. Both aspects are relevant to explaining export and import activity and price responses to TU.

5.1.2 Application: Third-country effects of TU shocks, the case of China

So far, we have focused on the direct effect of trade uncertainty shocks on Chilean firms' foreign trade. By doing this, the paper shows that increases in TU negatively affect the value of Chilean exports. As an application, we now consider one specific trade uncertainty episode, which is the increase in TU in China in 2017, and how it affected Chilean exports to the United States. The trade uncertainty shock event we examine corresponds to the initial trade tensions between China and the U.S. when ex President Donald Trump took office in 2017. To illustrate these initial tensions, Figure A.7 in the Appendix depicts the evolution of TUI and the change in TUI of China as defined in Carrière-Swallow and Céspedes (2013). The reason for considering this event and not the well-known episode starting with the rise in U.S. tariffs to Chinese imports in 2018 (followed by the retaliation policy of China) is that they started in the last year of our sample period.

This application delves into the indirect effects or third-country effects of surges in trade uncertainty on Chilean exports, in this analysis, Chilean exports to the U.S. The reason for focusing on Chilean exports to the United States is that the country is the largest destination for Chilean exports (excluding mining). Intuitively, Chinese exporters to the U.S. are likely to decrease their exports to the U.S. in response to the rise in trade uncertainty in China. Consequently, Chilean exporters competing with their Chinese counterparts in selling goods to the U.S. may benefit from this surge in trade uncertainty and increase their exports to the U.S. Hence, when examining Chilean exports to the U.S., we anticipate a positive coefficient for the trade uncertainty shock in China.

Table B.7 in the appendix presents the regression estimates with the dependent variable being the change in the value of Chilean firms' exports to the United States. The table comprises three panels of results, each with two columns, reflecting different combinations of independent variables to measure the influence of the TU shock in China and products considered in the analysis. In the first panel, we include the change in TUI (as defined in Carrière-Swallow and Céspedes (2013)) of China as independent variable. For robustness, in the second panel, the independent variable is a dummy variable for the TU shock in China, which takes the value of one during the first three quarters of 2017 and zero otherwise. We denote this indicator as $TUD_{China,t}$. In the final panel, we add to the specification with $TUD_{China,t}$ an additional dummy variable for the import tariff increases in the US corresponding to the first two quarters of 2018. In the first

column of each panel, all Chilean exports to the U.S. are considered. In the second column, products exported by Chinese firms to the U.S. are excluded. Column two in each panel aims to cleanse the results from any product substitution effects arising due to the surge of TU in China.

Results in Table B.7 align with our predictions, showing that the trade uncertainty shock in China leads to the rise in Chilean exports to the U.S. This suggests that Chilean exporters may indeed benefit from these third-country effects resulting from the trade reaccommodations between U.S. and China's foreign trade. Interestingly, this finding is consistent with Fajgelbaum et al. (2023) who show that the U.S.-China trade war of 2018-2019 created net export-opportunities to certain "bystander" countries which grew their exports of taxed products into the rest of the world. Moreover, the direct impact of a TU shock in the U.S. on Chilean exports to the U.S. remains negative, consistent with the results already presented in the paper.

To conclude, it is important to mention that this exercise does not aim to systematically investigate the third-country effects of surges in trade uncertainty. A comprehensive analysis would require, for instance, defining product-time dummy variables that indicate the periods when specific product categories are impacted by rising trade uncertainty, establishing a treatment period, and applying a difference-in-difference estimation framework. This approach would compare trade volumes across different product categories during times when only a subset is affected by increased trade uncertainty, such as through rising tariffs.[19] However, such an analysis is beyond the scope of this paper.

5.1.3 Robustness checks

As a robustness check, in appendix E, 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.

[19] For example, Correa et al. (2024) examine the impact of the 2018-2019 trade tensions between China and the U.S. on global supply chains and how these changes affected a bystander country, Colombia.

5.2 On credit outcomes

5.2.1 Baseline estimates

We now investigate the indirect effects of increasing trade uncertainty on firms by examining whether these demand shocks that affect trading firms spill over to other firms —not initially hit by the shocks— through the bank credit market. Precisely, we examine the following three research questions. i) Does trade uncertainty affect domestic credit outcomes? ii) Does increasing trade uncertainty impact credit outcomes differently for trade firms exposed to the shocks relative to firms not hit by them (including non-trading firms)? iii) Do banks amplify or mitigate the trade uncertainty shocks to other firms through the credit market?

To answer the questions above, we rely on the variable firm's foreign-trade status, which allows us to classify firms into seven categories. The labels of the seven categories are 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. Therefore, the interaction between the firm's foreign-trade status and the country-specific trade uncertainty indexes allows us to disentangle the heterogeneous impacts of trade uncertainty on firms' credit outcomes.

Table 5 examines the first question above by exhibiting the estimates of the model specification in equation (3), which excludes the categorical variable for the firm's status and its interaction with TUI ($\gamma = \delta = 0$ in equation (3)). In turn, Table 6 assesses the second question above by reporting the estimates for the complete model specifications in equation (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 loan maturities as dependent variable. In addition, the top panel in Table 6 reports the estimated coefficients, while the bottom panel in the same table exhibits the marginal effects of trade uncertainty for the various firm statuses.

Table 5: Overall impact of country-specific trade uncertainty indexes on credit outcomes: loan amounts, interest rates, and maturities

	(1) Amount All	(2) Amount LC	(3) Int. Rate All	(4) Int. Rate LC	(5) Maturity All	(6) Maturity 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 equation (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 6: 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***	-0.003***	-0.038***	0.005	-0.005***	-0.003***
	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)
$TUI_{ct} \times Status_{fct} = 1$	-0.018	-0.016	0.092**	0.061	0.003	0.008
	(0.011)	(0.012)	(0.039)	(0.044)	(0.010)	(0.011)
$TUI_{ct} \times Status_{fct} = 2$	0.018***	0.010	0.199***	0.016	0.005	0.022
	(0.007)	(0.013)	(0.026)	(0.064)	(0.007)	(0.015)
$TUI_{ct} \times Status_{fct} = 3$	0.003	0.005	0.010	0.010	0.007**	0.008**
	(0.003)	(0.003)	(0.012)	(0.012)	(0.003)	(0.003)
$TUI_{ct} \times Status_{fct} = 4$	0.012***	0.013***	0.062***	-0.018	0.011***	0.009***
	(0.003)	(0.003)	(0.010)	(0.011)	(0.003)	(0.003)
$TUI_{ct} \times Status_{fct} = 5$	0.002	0.004	-0.044	-0.041	0.015**	0.015*
	(0.008)	(0.009)	(0.028)	(0.033)	(0.007)	(0.008)
$TUI_{ct} \times Status_{fct} = 6$	0.012***	0.006*	0.122***	-0.025**	0.010***	0.012***
	(0.003)	(0.003)	(0.009)	(0.011)	(0.002)	(0.003)
	Marginal effect of TUI_{ct} at:					
$Status_{fct} = 0$	-0.006***	-0.003***	-0.038***	0.005	-0.005***	-0.003***
	(0.001)	(0.001)	(0.004)	(0.004)	(0.001)	(0.001)
$Status_{fct} = 1$	-0.024**	-0.019	0.054	0.066	-0.002	0.004
	(0.011)	(0.012)	(0.039)	(0.043)	(0.010)	(0.011)
$Status_{fct} = 2$	0.012*	0.007	0.161***	0.021	0.000	0.019
	(0.006)	(0.013)	(0.025)	(0.064)	(0.007)	(0.015)
$Status_{fct} = 3$	-0.003	0.002	-0.028***	0.015	0.002	0.004
	(0.003)	(0.003)	(0.010)	(0.010)	(0.003)	(0.003)
$Status_{fct} = 4$	0.007***	0.010***	0.024***	-0.013	0.006**	0.005*
	(0.002)	(0.003)	(0.008)	(0.010)	(0.002)	(0.003)
$Status_{fct} = 5$	-0.004	0.001	-0.082***	-0.037	0.010	0.012
	(0.008)	(0.009)	(0.027)	(0.032)	(0.007)	(0.008)
$Status_{fct} = 6$	0.006***	0.003	0.084***	-0.020**	0.005**	0.008***
	(0.002)	(0.003)	(0.007)	(0.010)	(0.002)	(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 equation (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 their 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 5 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. This is thus indicating that, in the aggregate, increases in trade uncertainty do not alter the amount or the credit conditions of the new loans granted to firms. However, when distinguishing by firms' foreign-trade statuses, Table 6 shows that increases in trade uncertainty do result in significant changes in loan amounts, interest rates, and maturities. More specifically, starting with the marginal effects of trade uncertainty on non-trading firms (our base category), we find that when trade uncertainty augments, the amounts of the new loans granted to these firms decrease. The same occurs for the maturities and the interest rates of the new loans to these firms. The estimated marginal effects for interest rates and maturities of the new loans to non-trading firms are hence indicating that there is no worsening of credit conditions for non-trading firms *per se*, but rather a contraction in the duration of their new loan contracts (at smaller interest rates) during periods of higher trade uncertainty.

In the case of firms exporting to a country (or region) c with elevated trade uncertainty, Table 6 shows that increasing trade uncertainty does not significantly affect the amounts or the maturities of the new loans granted to them (the corresponding marginal effects are not statistically significant). However, the impact of trade uncertainty on the interest rates charged to these firms is positive and statistically significant.[20] We interpret the latter 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 exporters not exporting to a country (or region) c exhibiting higher TUI, Table 5 indicates that the new loans granted to these firms are smaller when trade uncertainty augments, while there is no significant impact of TU on the interest rates or the maturity of the new loans granted to them.

Focusing now on importers, Table 6 shows that the new loan amounts granted to firms importing from countries with higher trade uncertainty do increase when TUI augments. 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

[20] Although we do not observe the loan amounts associated with each foreign trading partner of a firm f, stacking observations, the interaction term between trade uncertainty and a firm's status, and weighting observations by the importance of a given country (or region) of destination/origin for firms, allow 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.

on the maturity of the new loans to firms importing from the country (or region) c being positive and significant. This is interesting as it indicates that in the case of importers affected by higher (origin-specific) trade uncertainty, bank credit helps these firms mitigate the impact of trade uncertainty on their credit outcomes.

Finally, when examining the marginal impact of the new loans granted to GVCs trading with a country (or region) c exhibiting rising trade uncertainty, we find a similar pattern to the one described for importers hit by the trade uncertainty shock. Precisely, Table 6 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 quarters of 2018 due to the uncertainty induced by the Brexit) implies a 7.6% expansion of new credit granted to these firms, at 3.7 bp higher interest rates, and with a 5.8% longer maturity (in days). For these computations, we consider the estimates when including all loans.[21]

One consideration to make regards the currency of denomination of the new loans in Table 6. Indeed, when comparing the estimated marginal effects in that table corresponding to total loans and to loans in local currency (columns one *versus* two, three and four, and five and six, for loan amounts, interest rates, and maturities, respectively), results show that the marginal effects of TU on credit outcomes across firms' statuses are globally consistent between themselves, except for the marginal effects of TU on the interest rates of equilibrium. Indeed, Table 6 shows that the marginal effects of trade uncertainty on the interest rates of the new loans granted (especially to trade firms) are less significant when the loans are denominated in local currency.

To interpret these findings, Tables B.2 and B.3 in the Appendix document the main characteristics of new loans distinguishing between non-trading and trading firms and by currency. On the one hand, the evidence shows that trade firms have better access to loans in foreign currency, relative to non-trade firms. As a matter of fact, 40% of the new loans granted to trade firms are in foreign currency (mainly in U.S. dollars), well above the 3% that this type of loan represents for non-trade firms. On the other hand, loans in foreign currency are larger and exhibit smaller interest rates. We conclude from

[21] Considering the averages for foreign-trade firms in Table B.2, in economic terms, the increase in the TUI amounts to 66 thousand U.S. dollars more and 6.4 more months of maturity.

the above that the larger sensitivity to increasing trade uncertainty of the equilibrium interest rates of all new loans (compared to the marginal effects of TU on the interest rates of the new loans in local currency) is mainly driven by the larger impact of trade uncertainty on the interest rates of the new loans in foreign currency.

Nevertheless, it is important to add that the elements above do not imply that our results are biased. This is because we fully control for the heterogeneities of the firms in our sample by including their foreign status, which captures the differences in firms' access to credit in foreign currency, as well as granular sector-time and firm-bank-country fixed effects.

We now turn our attention to whether banks can amplify or mitigate the trade uncertainty shocks to other firms through the credit market. We rely on the Banking Credit Survey. Table C.1 in Appendix C exhibits the estimates of the various seemingly unrelated regressions' specifications. The main finding to extract from Table C.1 is that, in the aggregate, increases in TU 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.

These two pieces of evidence provide support for the interpretation that increasing trade uncertainty has led to a redistribution of credit across different types of firms, without any significant impact on the aggregate credit. We conclude from this that banks have spilled over the trade uncertainty shock to other firms. However, we do not find amplification effects from banks, as the aggregate credit supply did not contract following the trade uncertainty shocks. Finally, it is important to add that over our time frame, there were no banking crises in Chile, which could have affected the credit supply conditions.

Wrapping up, increasing trade uncertainty has led to a redistribution of credit towards GVC firms and importers, directly affected by the rise in trade uncertainty. The intuition behind this result is the following: trade firms operating with foreign firms which become financially constrained due to increasing trade uncertainty, demand more credit from local banks. Rising demand, combined with banks' risk management practices, leads to a rebalancing of loan portfolios. We document that GVCs and importers receive more credit in detriment of non-trade firms, especially smaller ones.

In the next section, we exploit firms' heterogeneities to dig deeper into the mechanisms explaining our credit redistribution finding.

5.2.2 The influence of firm characteristics on credit outcomes

We now exploit firms' heterogeneity to assess whether trade uncertainty has affected credit outcomes differently, 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 average number of trading partners a firm has. Table 7 exhibits the marginal estimated effects of equation (4) when 1_f is the indicator variable for large firms. In turn, Table 8 presents the marginal effects when estimating equation (4) but when 1_f is the dummy variable for firms with many trading partners.

Table 7: Impact of country-specific trade uncertainty indexes on credit outcomes distinguishing among firm's size and foreign-trade status

	(1) Amount	(2) Int. Rate	(3) Term	(4) Amount	(5) Int. Rate	(6) Term
	Mg effects of TUI_{ct} on small firms			Mg effects of TUI_{ct} on large firms		
$\text{Status}_{fct} = 0$	-0.012***	-0.024***	-0.005***	0.004**	-0.061***	-0.005***
	(0.001)	(0.006)	(0.001)	(0.002)	(0.007)	(0.002)
$\text{Status}_{fct} = 1$	-0.067***	0.102	0.010	-0.006	0.035	-0.006
	(0.017)	(0.090)	(0.019)	(0.013)	(0.041)	(0.012)
$\text{Status}_{fct} = 2$	0.027	-0.066	0.002	0.011	0.197***	-0.000
	(0.017)	(0.068)	(0.019)	(0.007)	(0.027)	(0.007)
$\text{Status}_{fct} = 3$	-0.005	-0.025	0.007	-0.001	-0.032***	-0.000
	(0.005)	(0.021)	(0.005)	(0.003)	(0.011)	(0.003)
$\text{Status}_{fct} = 4$	-0.001	-0.021	0.006*	0.011***	0.049***	0.005*
	(0.003)	(0.014)	(0.003)	(0.003)	(0.010)	(0.003)
$\text{Status}_{fct} = 5$	0.007	-0.177**	0.023	-0.006	-0.058**	0.007
	(0.017)	(0.080)	(0.020)	(0.008)	(0.028)	(0.007)
$\text{Status}_{fct} = 6$	0.001	-0.001	0.005	0.007***	0.094***	0.005**
	(0.007)	(0.025)	(0.006)	(0.002)	(0.007)	(0.002)
Obs.	2,562,792	2,562,792	2,562,792	2,562,792	2,562,792	2,562,792
R^2	0.816	0.819	0.609	0.816	0.819	0.609
Adjusted R^2	0.773	0.777	0.517	0.773	0.777	0.517

This table exhibits the estimates of equation (4), 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 their 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 8: Impact of country-specific trade uncertainty indexes on credit outcomes distinguishing among firms' foreign trade statuses and number of trading partners

	(1) Amount	(2) Int. Rate	(3) Term	(4) Amount	(5) Int. Rate	(6) Term
	Marginal effects of TUI on firms with few trading partners at:			many trading partners at:		
$\text{Status}_{fct} = 0$	-0.006***	-0.039***	-0.005***	-0.007	0.107***	-0.013
	(0.001)	(0.004)	(0.001)	(0.008)	(0.029)	(0.008)
$\text{Status}_{fct} = 1$	-0.020*	0.055	-0.003	-0.029	0.032	0.004
	(0.012)	(0.045)	(0.011)	(0.025)	(0.077)	(0.022)
$\text{Status}_{fct} = 2$	0.016	0.037	-0.008	0.012	0.204***	0.003
	(0.013)	(0.063)	(0.016)	(0.007)	(0.024)	(0.007)
$\text{Status}_{fct} = 3$	-0.002	-0.033***	0.002	-0.009	-0.003	0.003
	(0.003)	(0.011)	(0.003)	(0.007)	(0.027)	(0.009)
$\text{Status}_{fct} = 4$	0.007**	-0.022*	0.006*	0.006**	0.059***	0.005*
	(0.003)	(0.013)	(0.003)	(0.003)	(0.011)	(0.003)
$\text{Status}_{fct} = 5$	-0.012	-0.078**	0.004	0.013	-0.117***	0.023**
	(0.011)	(0.037)	(0.010)	(0.011)	(0.043)	(0.010)
$\text{Status}_{fct} = 6$	0.008	-0.052*	0.012	0.006***	0.094***	0.004**
	(0.007)	(0.028)	(0.008)	(0.002)	(0.007)	(0.002)
Obs.	2,562,792	2,562,792	2,562,792	2,562,792	2,562,792	2,562,792
R^2	0.816	0.812	0.609	0.816	0.812	0.609
Adjusted R^2	0.773	0.777	0.517	0.773	0.777	0.517

This table exhibits the estimates of equation (4), 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 their 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 7 show that when trade uncertainty increases, there is a crowding out effect from small non-trading firms and small exporters not directly affected by the increasing TU toward larger firms, in particular, GVCs and importers that are exposed to growing trade uncertainty. Results in Table 7 add to our analysis in Table 6 by showing that larger GVCs and importers may be the ones being perceived by banks as involving smaller risks. Furthermore, we can connect the findings for GVCs with those

exhibited in Table 2. Indeed, Table 2 shows that GVCs' imports grow more during periods of higher trade uncertainty when their imports —from countries exhibiting increasing trade uncertainty— are mainly financed with bank credit. What Table 7 contributes to our understanding is that this is the case for larger GVCs.

Interesting for our analysis and 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 7 is that larger firms may rely more heavily on domestic banks when credit conditions in foreign markets become more restrictive. In the same line, Chodorow-Reich et al. (2022) show that during the COVID-19 pandemic, large firms drew out more from their credit lines, compared to smaller firms.

Finally, when distinguishing firms in terms of the number of trading partners they have, results in Table 8 are also consistent with a crowding-out effect, this time from firms with few foreign-trade connections toward more connected firms. In this regard, larger firms also tend to be those that have more trading partners (as Table B.8 in the Appendix suggests).[22]

5.2.3 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 during periods of higher trade uncertainty. For the analysis, we estimate the model specification in equation (5). To capture banks' business model traits, as detailed in Section 4.2.3, 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.

The traits we consider are the balance sheet quality, the share of liabilities in foreign currency, whether the bank is a subsidiary, the intensity of linkages between the Chilean bank and its controller or related bank, and the banks' specialization measure as defined in Paravisini et al. (2021). 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 *the Chilean Public Bank*, which is the largest public bank in Chile. The reason for this different treatment for *the Chilean Public Bank* (we omit its name for confidentiality reasons) is that this bank has a social role in providing credit to debtors

[22] 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 8. Estimates are available from the authors upon request.

that may not be eligible for credit in other financial institutions (for example, unbanked people). As a result, the share of NPLs in this estate-owned bank is considerably higher compared to the other banks in the system, which in turn justifies having it as a separate category. Table 9 considers loan amounts as the dependent variable, whereas Tables 10 and 11 have interest rates and maturities, respectively, as dependent variables. The column headings in each table indicate the business model trait being analyzed in the corresponding column of estimated results.

Table 9: 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 REL	Subsidiary bank	NPL ratio	Bank size
	Estimated coefficients					
$TUI_{c,t}$	-0.004***	0.004***	-0.002**	-0.002*	0.008***	-0.014***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$TUI_{c,t}\times$ BankChar$_b$ = 1	0.009***	-0.050***	0.003	0.002	-0.027***	0.023***
	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.002)
$TUI_{c,t}\times$ BankChar$_b$ = 2					-0.020***	
					(0.003)	
					(0.003)	
	Marginal effect of TUI_{ct} at:					
BankChar$_b$ = 0	-0.004***	0.004***	-0.002***	-0.002***	0.004***	-0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
BankChar$_b$ = 1	0.005***	-0.046***	0.001	-0.000	-0.004***	0.011***
	(0.001)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)
BankChar$_b$ = 2					-0.013***	
					(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 from equation (5). 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 *the Chilean Public Bank*. 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. REL stands for related or controller foreign bank. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 10: 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 REL	Subsidiary bank	NPL ratio	Bank size
	Estimated coefficients					
$TUI_{c,t}$	0.089***	-0.030***	-0.026***	0.079***	-0.100***	0.146***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)
$TUI_{c,t}\times$ BankChar$_b = 1$	-0.297***	0.282***	0.078***	-0.196***	-0.321***	-0.258***
	(0.007)	(0.015)	(0.006)	(0.007)	(0.010)	(0.007)
$TUI_{c,t}\times$ BankChar$_b = 2$					-0.168***	
					(0.008)	
	Marginal effects of TUI_{ct} at:					
BankChar$_b = 0$	0.089***	-0.030***	-0.026***	0.079***	-0.100***	0.146***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)
BankChar$_b = 1$	-0.208***	0.242***	0.052***	-0.116***	0.221***	-0.112***
	(0.007)	(0.015)	(0.006)	(0.007)	(0.010)	(0.007)
BankChar$_b = 2$					0.068***	
					(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	0.772	0.771	0.771

This table exhibits the estimates from equation (5). 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 *the Chilean Public Bank*. 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. REL stands for related or controller foreign bank. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 11: 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) Share of liabs. in foreign currency	(2) Foreign-trade special-ization	(3) Gross cross-border positions with REL	(4) Subsidiary bank	(5) NPL ratio	(6) Bank size
	Estimated coefficients					
$TUI_{c,t}$	-0.002**	0.006***	0.004***	0.005***	0.002*	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
$TUI_{c,t}\times$ BankChar$_b = 1$	0.006***	-0.065***	-0.013***	-0.011***	-0.003	0.003
	(0.002)	(0.004)	(0.002)	(0.002)	(0.003)	(0.002)
$TUI_{c,t}\times$ BankChar$_b = 2$					-0.011***	
					(0.003)	
	Marginal effect of TUI_{ct} at:					
BankChar$_b = 0$	-0.002***	0.006***	0.004***	0.005***	0.002*	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
BankChar$_b = 1$	0.004***	-0.058***	-0.009***	-0.007***	-0.001	0.001
	(0.002)	(0.004)	(0.001)	(0.001)	(0.002)	(0.001)
BankChar$_b = 2$					-0.009***	
					(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 from equation (5). 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 *the Chilean Public Bank*. 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. REL stands for related or controller foreign bank. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

To begin with, Table 9 shows that larger and less risky banks 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 riskier banks, banks with weak linkages with their related banks abroad (which occurs when the cross-border positions between the given bank and its controller 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 related foreign banks.

We conclude from the above that less risky banks, larger banks, and banks with more liabilities in foreign currency have unique features that allow them to provide more credit during periods of increasing trade uncertainty. 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 to not contract credit when trade uncertainty increases. A similar (but reverse) reasoning may explain why banks with weak linkages with their controller and domestic banks appear to tighten credit when the country-specific trade uncertainty index increases.

A second important finding regards banks' specialization (as proxied by the specialization measure à la Paravisini et al. (2021)). Table 9 shows that when trade uncertainty augments, banks that are specialized in the countries exhibiting rising TU react to the negative trade uncertainty shock by reducing the size of the new loans granted. This is thus suggesting that, in addition to reducing their individual exposures to certain types of firms (when TU increases), these specialized banks also reduce overall risks that they are exposed to in their portfolio of loans. Note however that, in Chile, banks that appear to be specialized according to Paravisini et al. (2021)'s measure are small and foreign and do not represent an important fraction of total loans provided to firms. Therefore, we conclude that the global mitigation strategy is only followed by a specific subset of banks.

Focusing now on the model estimates when interest rates and loan maturities are the dependent variables (Tables 10 and 11, respectively), we find that larger banks not only provide more credit but also offer more advantageous credit conditions during periods of higher trade uncertainty. This is because they extend new loans with lower interest rates (the opposite is true for smaller banks). Furthermore, when trade uncertainty augments, domestic banks extend new credits with longer maturities but at higher interest rates. Finally, banks specializing in foreign countries exhibiting rising trade uncertainty react to the trade uncertainty shock not only by reducing the size of the new credits granted but also by increasing the interest rates and reducing the maturity 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 controller or related bank abroad.

5.2.4 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 D.1, D.2, and D.3 in the Appendix present the estimates for loan amounts, interest rates, and maturities (equation (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 new credit (extended) 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 they 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 equation (3). Table D.4 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 results on credit outcomes 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^c_{ft}; 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}); iv) we allow for different weighting schemes in the WLS specifications. Importantly, our results are robust to the alternative weights and definitions described above.

6 Conclusions

In this paper, we exploit the exogenous variations of destination/origin-specific trade uncertainty indexes to identify the direct effect of rising trade uncertainty on firms' foreign-trade performance and the spillover effects of the shock through banks' credit provision. 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 higher trade uncertainty dampens export growth in the aggregate and when exports are paid in advance. Furthermore, imports grow more with increases in trade uncertainty if they are paid in advance or through bank credit. These results are consistent with a working capital channel for the transmission of trade uncertainty shocks. Moreover, we find that under elevated trade uncertainty, there is a redistribution of bank credit from non-trade firms toward larger 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 more exposed to developed economies, with these countries being the ones exhibiting increasing trade uncertainty over the period of 2016 to 2018.

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 smaller export growth —with no effect on total imports— and to a redistribution of bank credit among firms (without a significant impact on total credit). However, the possible future 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 continuously demand and obtain new loans 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 proxies for credit demand factors.

Funding statement This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declarations of interest: none

References

Ahir, H., N. Bloom, and D. Furceri (2022). The world uncertainty index. Working Paper 29763, National Bureau of Economic Research, Cambridge, MA.

Amiti, M., S. J. Redding, and D. E. Weinstein (2019). The impact of the 2018 tariffs on prices and welfare. *Journal of Economic Perspectives 33*(4), 187–210.

Antràs, P. (2020). Conceptual aspects of global value chains. *The World Bank Economic Review 34*(3), 551–574.

Antràs, P. (2020, November). De-Globalisation? Global Value Chains in the Post-COVID-19 Age. NBER Working Paper 28115, National Bureau of Economic Research, Cambridge, MA.

Antràs, P. and D. Chor (2022). Global value chains. In *Handbook of International Economics*, Volume 5, pp. 297–376. Elsevier.

Antràs, P. and C. F. Foley (2015, August). Poultry in Motion: A Study of International Trade Finance Practices. *Journal of Political Economy 123*(4), 853–901.

Attig, N., S. El Ghoul, O. Guedhami, and X. Zheng (2021). Dividends and economic policy uncertainty: international evidence. *Journal of Corporate Finance 66*, 101785.

Bernard, A. B., J. B. Jensen, S. J. Redding, and P. K. Schott (2007). Firms in international trade. *Journal of Economic perspectives 21*(3), 105–130.

Bernard, A. B., J. B. Jensen, and P. K. Schott (2009). Importers, exporters and multinationals: A portrait of firms in the u.s. that trade goods. In T. Dunne, J. Jensen, and M. J. Roberts (Eds.), *Producer Dynamics: New Evidence from Micro Data*, Volume 68 of *Studies on Income and Wealth*, pp. 512–552. University of Chicago Press.

Bloom, N. (2009). The impact of uncertainty shocks. *econometrica 77*(3), 623–685.

Bordo, M. D., J. V. Duca, and C. Koch (2016). Economic policy uncertainty and the credit channel: Aggregate and bank level us evidence over several decades. *Journal of Financial Stability 26*, 90–106.

Carrière-Swallow, Y. and L. F. Céspedes (2013). The impact of uncertainty shocks in emerging economies. *Journal of International Economics 90*(2), 316–325.

Chodorow-Reich, G., O. Darmouni, S. Luck, and M. Plosser (2022, June). Bank liquidity provision across the firm size distribution. *Journal of Financial Economics 144*(3), 908–932.

Correa, R., J. di Giovanni, L. S. Goldberg, and C. Minoiu (2023). Trade uncertainty and us bank lending. Technical report, National Bureau of Economic Research.

Correa, R., A. Fabiani, M. Ossandon Busch, and M. Sarmiento (2024). The ripple effect: Supply chain reconfigurations and cross-border credit dynamics. Mimeo.

Costello, A. M. (2020). Credit market disruptions and liquidity spillover effects in the supply chain. *Journal of Political Economy 128*(9), 3434–3468.

Degryse, H., O. De Jonghe, S. Jakovljević, K. Mulier, and G. Schepens (2019). Identifying credit supply shocks with bank-firm data: Methods and applications. *Journal of Financial Intermediation 40*, 100813. Bank-firm relationships in the post-crisis era.

Dell'Ariccia, G., L. Laeven, and G. Suárez (2017). Bank leverage and monetary policy's risk-taking channel: Evidence from the united states. *The Journal of Finance 72*(2), 613–654.

Ellingsen, T. and J. Vlachos (2009, November). Trade finance in a liquidity crisis. Technical report, The World Bank.

Fajgelbaum, P., P. K. Goldberg, P. J. Kennedy, A. Khandelwal, and D. Taglioni (2023). The us-china trade war and global reallocations. *American Economic Review Insights Forthcoming*.

Fajgelbaum, P. D., P. K. Goldberg, P. J. Kennedy, and A. K. Khandelwal (2020, February). The Return to Protectionism. *The Quarterly Journal of Economics 135*(1), 1–55.

Fajgelbaum, P. D., P. K. Goldberg, P. J. Kennedy, and A. K. Khandelwal (2022, February). The return to protectionism. *The Quarterly Journal of Economics 135*(1), 1–55.

Fajgelbaum, P. D. and A. K. Khandelwal (2022). The economic impacts of the us–china trade war. *Annual Review of Economics 14*, 205–228.

García, A., S. Justel, and T. Schmidt-Eisenlohr (2019). Trade credit, markups, and relationships. Working Paper 7600, CESifo, Munich, Germany.

Georgieva, K. (2023). *FOREIGN AFFAIRS : The Price of Fragmentation . Why the Global Economy Isn't Ready for the Shocks Ahead*. Council on Foreign Relations.

Graziano, A. G., K. Handley, and N. Limão (2021, April). Brexit Uncertainty and Trade Disintegration. *The Economic Journal 131*(ueaa113), 1150–1185.

Greenwald, D. L., J. Krainer, and P. Paul (2020). The Credit Line Channel. Working Paper 26, Federal Reserve Bank of San Francisco, San Francisco, CA.

Gulen, H. and M. Ion (2016). Policy uncertainty and corporate investment. *The Review of Financial Studies 29*(3), 523–564.

Handley, K. and N. Limão (2017, September). Policy Uncertainty, Trade, and Welfare: Theory and Evidence for China and the United States. *American Economic Review 107*(9), 2731–2783.

Hoefele, A., T. Schmidt-Eisenlohr, and Z. Yu (2016, February). Payment choice in international trade: Theory and evidence from cross-country firm-level data. *Canadian Journal of Economics/Revue canadienne d'économique 49*(1), 296–319.

Jiménez, G., S. Ongena, J.-L. Peydró, and J. Saurina (2012, August). Credit supply and monetary policy: Identifying the bank balance-sheet channel with loan applications. *American Economic Review 102*(5), 2301–2326.

Julio, B. and Y. Yook (2012). Political uncertainty and corporate investment cycles. *The Journal of Finance 67*(1), 45–83.

Kasahara, H. and B. Lapham (2013). Productivity and the decision to import and export: theory and evidence. *Journal of International Economics 89*, 297–316.

Manova, K. (2013, April). Credit Constraints, Heterogeneous Firms, and International Trade. *The Review of Economic Studies 80*(2), 711–744.

Manova, K., S.-J. Wei, and Z. Zhang (2015, July). Firm Exports and Multinational Activity Under Credit Constraints. *Review of Economics and Statistics 97*(3), 574–588.

Morais, B., J.-L. Peydró, J. Roldán-Peña, and C. Ruiz-Ortega (2019). The international bank lending channel of monetary policy rates and qe: Credit supply, reach-for-yield, and real effects. *The Journal of Finance 74*(1), 55–90.

Niepmann, F. and T. Schmidt-Eisenlohr (2017a, July). International trade, risk and the role of banks. *Journal of International Economics 107*, 111–126.

Niepmann, F. and T. Schmidt-Eisenlohr (2017b). No guarantees, no trade: How banks affect export patterns. *Journal of International Economics 108*, 338–350.

Paravisini, D., V. Rappoport, and P. Schnabl (2021, November). Specialization in Bank Lending: Evidence from Exporting Firms. *Journal of Finance forthcoming*.

Schmidt-Eisenlohr, T. (2013, September). Towards a theory of trade finance. *Journal of International Economics 91*(1), 96–112.

Xu, Z. (2020). Economic policy uncertainty, cost of capital, and corporate innovation. *Journal of Banking & Finance 111*, 105698.

Appendix

A Additional Figures

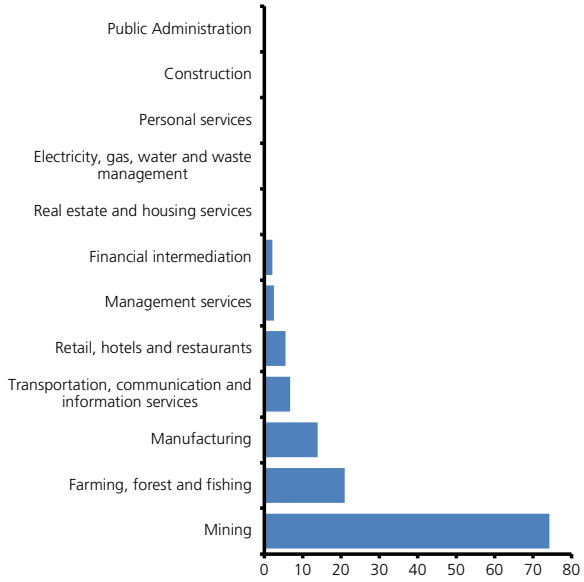

Figure A.1: Export intensity by sectors, according to the Chilean National Accounts' sector classifications. Export intensity is measured as the sector-specific ratio between exports and total output. The figure exhibits averages between 2013 and 2018. Source: Banco Central de Chile.

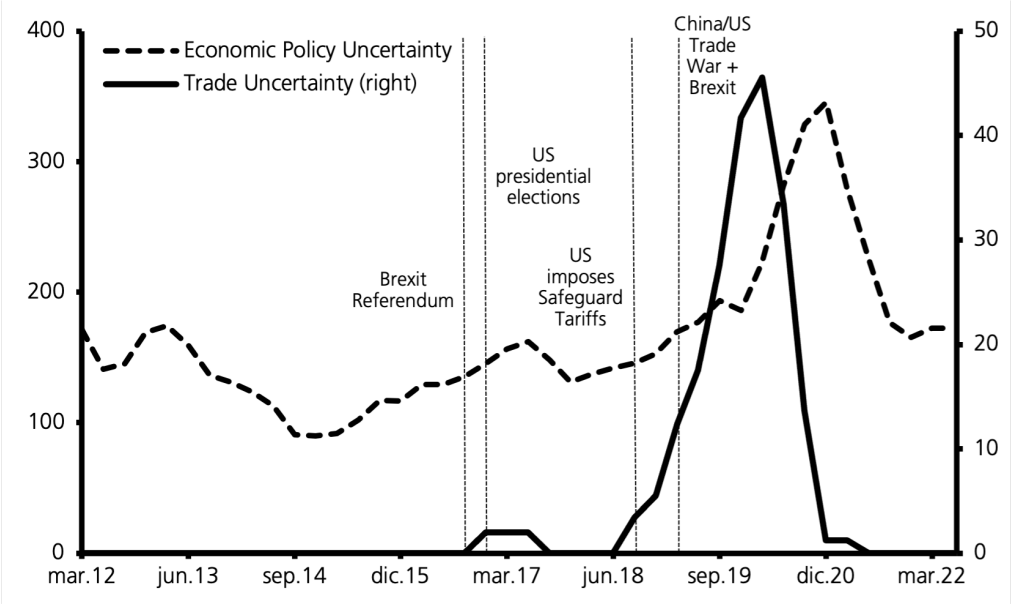

Figure A.2: United States. Economic Policy Uncertainty and Trade Uncertainty indexes. Economic Policy Uncertainty comes from www.policyuncertainty.com. The Trade Uncertainty Index comes from (Ahir et al., 2022). Indices have been re-scaled to make them comparable.

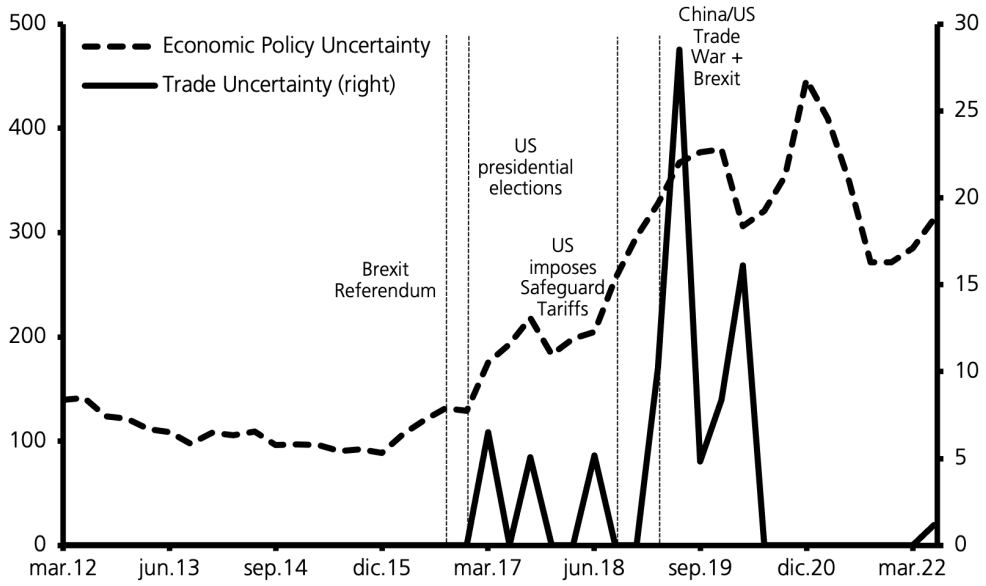

Figure A.3: China. Economic Policy Uncertainty and Trade Uncertainty indexes. Economic Policy Uncertainty comes from www.policyuncertainty.com. The Trade Uncertainty Index comes from (Ahir et al., 2022). Indices have been re-scaled to make them comparable.

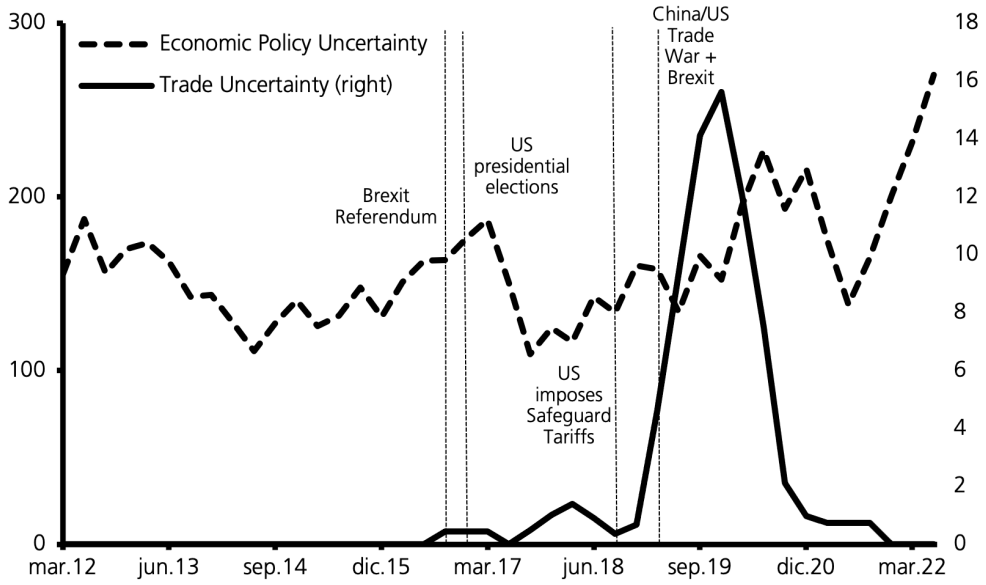

Figure A.4: European Union. Economic Policy Uncertainty and Trade Uncertainty indexes. Economic Policy Uncertainty comes from www.policyuncertainty.com. The Trade Uncertainty Index comes from (Ahir et al., 2022). Indices have been re-scaled to make them comparable.

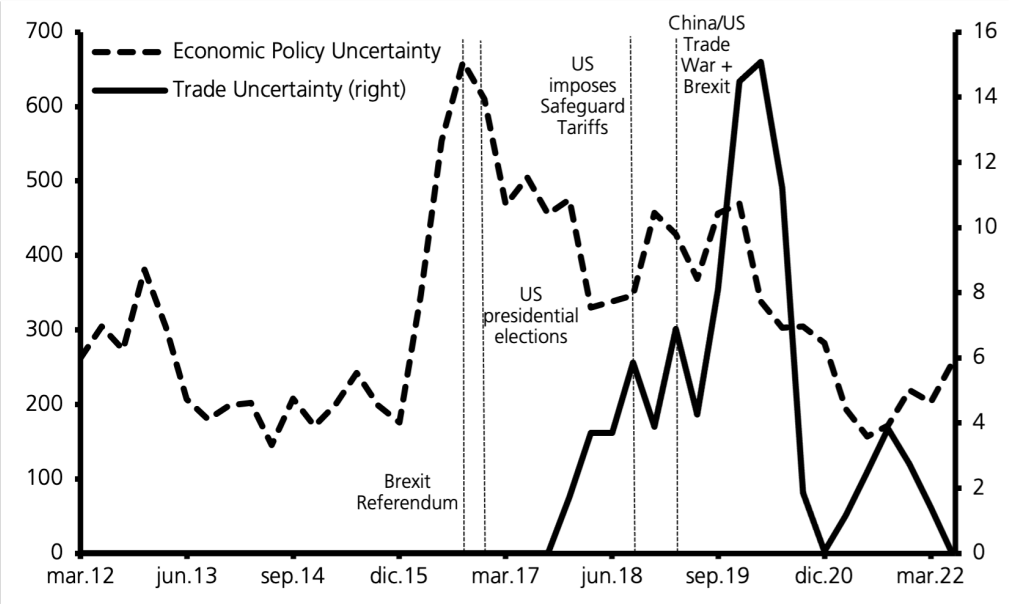

Figure A.5: United Kingdom. Economic Policy Uncertainty and Trade Uncertainty indexes. Economic Policy Uncertainty comes from www.policyuncertainty.com. The Trade Uncertainty Index comes from (Ahir et al., 2022). Indices have been re-scaled to make them comparable.

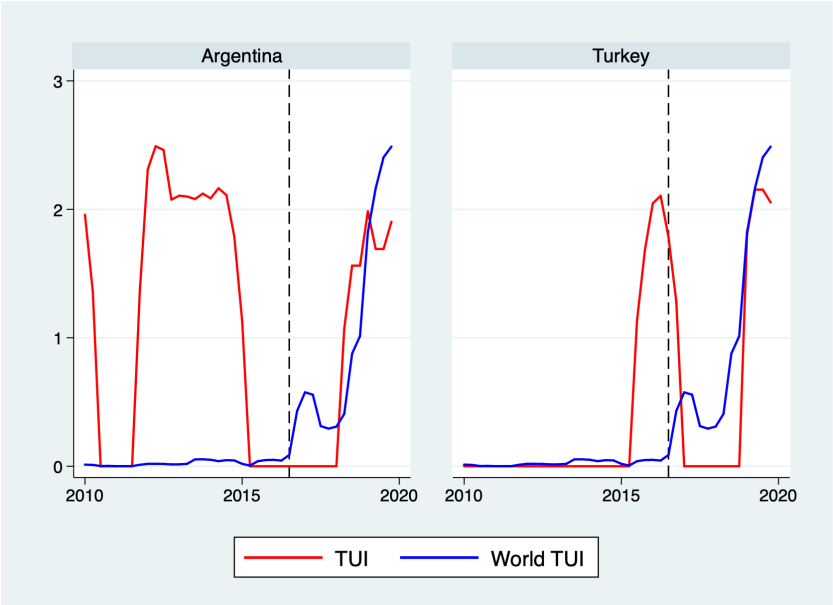

Figure A.6: Selected economies with high above median trade uncertainty indexes before the beginning of the 2016-2018 period characterized by rising trade uncertainty. The indexes are shown as 3-quarter average and are rescaled as the logarithm of one plus TUI. The World TUI is the GDP-weighted average of the country indexes.

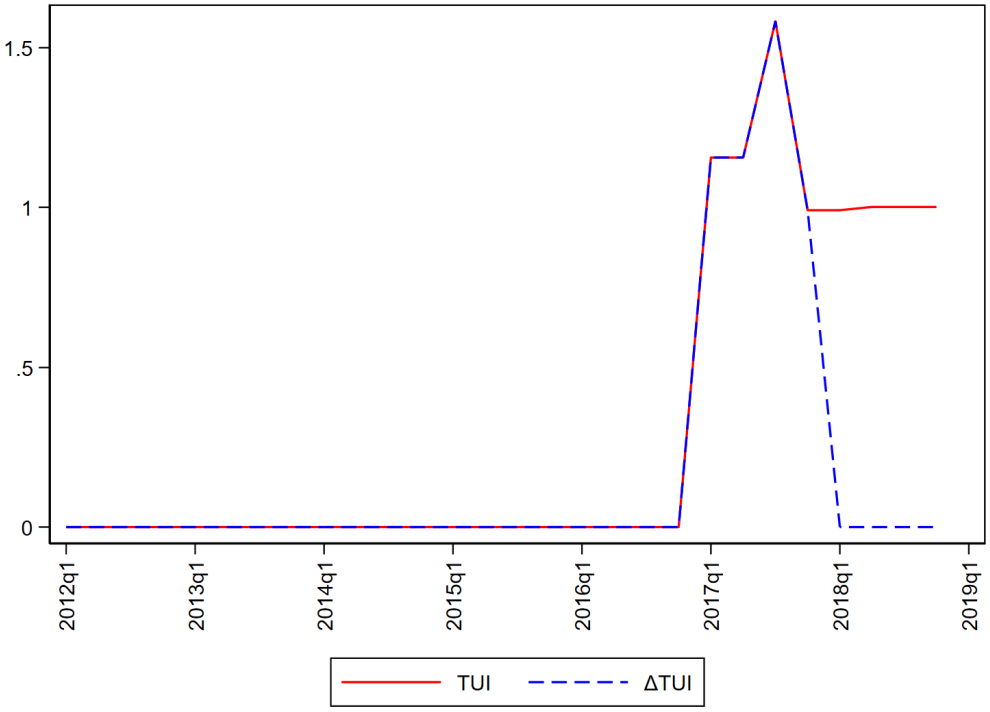

Figure A.7: Evolution of the trade uncertainty index of China and the change in TUI of China (as defined in Carrière-Swallow and Céspedes (2013))

B Additional Tables

Table B.1: Marginal effects of the country-specific trade uncertainty indexes on the share of rescheduled loans distinguishing by firm status

	(1)
$\text{Status}_{fct} = 1$	0.010
	(0.007)
$\text{Status}_{fct} = 2$	-0.011*
	(0.004)
$\text{Status}_{fct} = 3$	-0.002
	(0.002)
$\text{Status}_{fct} = 4$	-0.007
	(0.002)
$\text{Status}_{fct} = 5$	-0.001
	(0.004)
$\text{Status}_{fct} = 6$	-0.005***
	(0.002)
Firm-product-country FE	Yes
Firm-product-quarter FE	Yes
Product-country-year FE	Yes
Obs.	632,466
R^2	0.758
Adjusted-R^2	0.704

This table exhibits the marginal effects of the country-specific trade uncertainty indexes on the share of rescheduled loans distinguishing by firm status. The foreign-trade status of the firms is a categorical variable of value 0 if the firm only trades domestically; 1 if the firm is a net exporter 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 are net importers; 5 and 6 are also analogous to 1 and 2 but for GVC firms.$^{*}p < 0.10$,** $p < 0.05$,*** $p < 0.01$.

Table B.2: Summary statistics of the loan registry data distinguishing between non-trade and trade firms

	Loan characteristics	Mean	Std. Dev.	Median	90th pctile.
All firms	Amounts (mn. CLP)	440.9	4,059.2	55.4	629.1
	Interest rate (%)	10.7	6.9	9.3	19.6
	Term (months)	14.5	26.5	5.0	36.8
Firms without foreign trade	Amounts (mn. CLP)	160.2	1,959.8	30.0	213.6
	Interest rate (%)	13.8	7.0	12.7	22.2
	Term (months)	20.3	31.9	8.0	48.9
Firms with foreign trade	Amounts (mn. CLP)	702.3	5,301.3	110.1	1,100.0
	Interest rate (%)	7.8	5.3	6.7	14.9
	Term (months)	9.2	18.9	4.0	24.1

On average, 22.3% of the amounts corresponds to loans in U.S. dollars: this is 3.3% for non-trade firms and 40.1% for trade firms. Source: Central Bank of Chile and Financial Markets Commission. Data sample: 2012Q2-2019Q1.

Table B.3: Summary statistics of the loan registry data distinguishing by currency

	Loan characteristics	Mean	Std. Dev.	Median	90th pctile.
Local currency	Amounts (mn. CLP)	299.6	2,683.5	41.6	418.5
	Interest rate (%)	12.9	6.5	11.4	21.0
	Term (months)	13.1	18.6	4.1	36.7
Foreign currency	Amounts (mn. CLP)	748.4	5,552.9	120.8	1,178.0
	Interest rate (%)	4.3	2.6	3.9	7.3
	Term (months)	6.0	12.8	4.8	7.0

Source: Central Bank of Chile and Financial Markets Commission. Data sample: 2012Q2-2019Q1.

Table B.4: 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.5: 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.6: Marginal impacts of changes in country-specific TUIs on the probability of changing the main financing mode of the foreign trade operation

	(1) Exports	(2) Imports
$\Delta TUI_{c,t}$	0.001	0.000
	(0.002)	(0.002)
Firm-product-country FE	Yes	Yes
Firm-product-quarter FE	Yes	Yes
Product-country-year FE	Yes	Yes
Obs.	213,784	515,528
R^2	0.759	0.822
Adjusted-R^2	0.583	0.578

The table exhibits the marginal effects of changes in the country-specific TUI on the probability of changing the main financing mode of the foreign trade operation of firm f for product p in quarter t. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

Table B.7: Marginal effects of changes in TU shocks to China and the United States on the growth rate of Chilean exports to the United States

	(1) All	(2) Restricted	(3) All	(4) Restricted	(5) All	(6) Restricted
$\Delta TUI_{China,t}$	0.208***	0.461***				
	(0.092)	(0.150)				
$TUD_{China,t}$			0.207***	0.328***	0.208***	0.330***
			(0.046)	(0.068)	(0.046)	(0.015)
$TUD_{USA,t}$					-0.117**	-0.145*
					(0.039)	(0.060)
Product-Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Product-Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	26,205	10,938	26,205	10,938	26,205	10,938
R^2	0.232	0.217	0.233	0.218	0.233	0.219
Adjusted-R^2	0.074	0.068	0.074	0.070	0.075	0.070

This table shows the marginal effects of trade uncertainty shocks in China and the United States on the growth rate of the value of Chilean exports to the U.S. The marginal effects result from the estimation of equation (1). The dependent variable is the change in the value of Chilean firms' exports to the United States; it is winsorized at the one percent level. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table B.8: 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.

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 to 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:

$$R^S_{b(c)t} = \beta^S TUI_{ct} + \gamma^S X_{b,t-1} + \alpha^S_{fc} + \delta^S_t + \epsilon^S_{b(c)t} \tag{6}$$

$$R^D_{b(c)t} = \beta^D TUI_{ct} + \gamma^D X_{b,t-1} + \alpha^D_{fc} + \delta^D_t + \epsilon^D_{b(c)t} \tag{7}$$

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:

$$\omega_{bct} = \frac{\sum\limits_{f \in \mathcal{F}_{bt}} T_{fct}}{\sum\limits_{f \in \mathcal{F}_{bt}} \sum\limits_{k \in \mathcal{C}_{ft}} T_{fkt}} \tag{8}$$

First, we estimate a set of SURE for large firms, a 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	-0.000	0.000	0.002	0.000	0.002	0.000	0.002
	(0.005)	(0.009)	(0.006)	(0.008)	(0.005)	(0.009)	(0.006)	(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 Equation Equation (6) and Equation Equation (7). 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 Robustness checks on the effects of trade uncertainty on credit outcomes

Table D.1: 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}	-0.005***	-0.003	-0.004***
	(0.001)	(0.007)	(0.003)
$TUI_{ct}\times$ Status$_{fct}=1$	-0.019*	-0.015	0.083**
	(0.011)	(0.015)	(0.018)
$TUI_{ct}\times$ Status$_{fct}=2$	0.015**	0.019	0.160***
	(0.007)	(0.010)	(0.019)
$TUI_{ct}\times$ Status$_{fct}=3$	0.002	0.004	0.007
	(0.003)	(0.012)	(0.006)
$TUI_{ct}\times$ Status$_{fct}=4$	0.009***	0.010***	0.052***
	(0.003)	(0.008)	(0.006)
$TUI_{ct}\times$ Status$_{fct}=5$	-0.001	0.002	-0.054*
	(0.008)	(0.016)	(0.008)
$TUI_{ct}\times$ Status$_{fct}=6$	0.013***	-0.005	0.020***
	(0.003)	(0.007)	(0.008)
	Marginal effects of TUI_{ct} at:		
Status$_{fct}=0$	-0.006***	0.006	-0.004***
	(0.001)	(0.007)	(0.001)
Status$_{fct}=1$	-0.025**	-0.030**	0.049
	(0.011)	(0.013)	(0.018)
Status$_{fct}=2$	0.011	0.001	0.029
	(0.007)	(0.007)	(0.019)
Status$_{fct}=3$	-0.003	-0.015	-0.006
	(0.003)	(0.010)	(0.006)
Status$_{fct}=4$	0.006***	-0.006	0.014***
	(0.002)	(0.004)	(0.006)
Status$_{fct}=5$	-0.004	-0.011	0.005
	(0.008)	(0.014)	(0.018)
Status$_{fct}=6$	0.007***	0.001	0.016***
	(0.002)	(0.003)	(0.008)
Firm-bank-country FE	Yes	Yes	Yes
Sector-quarter FE	Yes	Yes	Yes
Bank-quarter FE	Yes	Yes	Yes
Obs.	2,546,302	484,959	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 (3). 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 D.2: 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}	-0.036***	-0.029***	0.006
	(0.004)	(0.014)	(0.004)
$TUI_{ct}\times$ Status$_{fct}=1$	-0.091**	0.037	0.120
	(0.040)	(0.031)	(0.080)
$TUI_{ct}\times$ Status$_{fct}=2$	0.018**	0.060**	0.056
	(0.028)	(0.019)	(0.049)
$TUI_{ct}\times$ Status$_{fct}=3$	0.010	0.002	-0.040*
	(0.012)	(0.022)	(0.022)
$TUI_{ct}\times$ Status$_{fct}=4$	0.060***	0.028*	-0.042*
	(0.010)	(0.016)	(0.024)
$TUI_{ct}\times$ Status$_{fct}=5$	-0.050*	0.021	-0.156***
	(0.028)	(0.025)	(0.059)
$TUI_{ct}\times$ Status$_{fct}=6$	0.117***	0.049**	0.036
	(0.009)	(0.015)	(0.027)
	Marginal coefficients of TUI_{ct} at:		
Status$_{fct}=0$	-0.036***	-0.029***	0.006
	(0.004)	(0.014)	(0.004)
Status$_{fct}=1$	0.055	0.008	0.126
	(0.039)	(0.027)	(0.079)
Status$_{fct}=2$	0.142***	0.031**	0.062
	(0.027)	(0.012)	(0.049)
Status$_{fct}=3$	-0.027***	-0.027*	-0.034
	(0.010)	(0.016)	(0.020)
Status$_{fct}=4$	0.024***	-0.001	-0.036
	(0.008)	(0.007)	(0.023)
Status$_{fct}=5$	-0.086***	-0.008	0.162***
	(0.027)	(0.020)	(0.058)
Status$_{fct}=6$	0.081***	0.020***	0.042
	(0.007)	(0.004)	(0.027)
Firm-bank-country FE	Yes	Yes	Yes
Sector-quarter FE	Yes	Yes	Yes
Bank-quarter FE	Yes	Yes	Yes
Obs.	2,546,302	484,959	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 (3). 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 D.3: 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***	-0.013***	-0.002
	(0.001)	(0.005)	(0.001)
$TUI_{ct}\times$ Status$_{fct}=1$	0.003	0.016	-0.003
	(0.007)	(0.008)	(0.025)
$TUI_{ct}\times$ Status$_{fct}=2$	0.005	0.017**	0.015
	(0.003)	(0.008)	(0.016)
$TUI_{ct}\times$ Status$_{fct}=3$	0.007**	0.018**	0.010
	(0.003)	(0.008)	(0.007)
$TUI_{ct}\times$ Status$_{fct}=4$	0.011***	0.020***	0.011
	(0.003)	(0.006)	(0.007)
$TUI_{ct}\times$ Status$_{fct}=5$	0.016**	0.024*	-0.015
	(0.007)	(0.013)	(0.027)
$TUI_{ct}\times$ Status$_{fct}=6$	0.010***	0.013***	0.009
	(0.002)	(0.006)	(0.009)
	Marginal coefficients of TUI_{ct} at:		
Status$_{fct}=0$	-0.005***	-0.013***	-0.002
	(0.001)	(0.005)	(0.001)
Status$_{fct}=1$	-0.002	0.003	-0.005
	(0.010)	(0.016)	(0.025)
Status$_{fct}=2$	-0.001	0.004	0.013
	(0.007)	(0.006)	(0.016)
Status$_{fct}=3$	0.002	0.005	0.008
	(0.003)	(0.006)	(0.006)
Status$_{fct}=4$	0.005**	0.006***	0.009
	(0.002)	(0.002)	(0.007)
Status$_{fct}=5$	0.011	0.011	-0.017
	(0.007)	(0.011)	(0.027)
Status$_{fct}=6$	0.005***	-0.001	0.007
	(0.002)	(0.002)	(0.009)
Firm-bank-country FE	Yes	Yes	Yes
Sector-quarter FE	Yes	Yes	Yes
Bank-quarter FE	Yes	Yes	Yes
Obs.	2,546,302	484,959	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 D.4: 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***	-0.003***	-0.034***	0.005	-0.005***	-0.003***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)
$TUI_{ct} \times$ Status$_{fct} = 1$	-0.019*	-0.015	0.083**	0.053	0.003	0.009
	(0.011)	(0.012)	(0.039)	(0.043)	(0.010)	(0.011)
$TUI_{ct} \times$ Status$_{fct} = 2$	0.015**	0.019	0.160***	0.014	0.002	0.025
	(0.007)	(0.015)	(0.027)	(0.067)	(0.009)	(0.020)
$TUI_{ct} \times$ Status$_{fct} = 3$	0.002	0.004	0.007	0.010	0.007**	0.008**
	(0.003)	(0.003)	(0.012)	(0.012)	(0.003)	(0.003)
$TUI_{ct} \times$ Status$_{fct} = 4$	0.009***	0.010***	0.052***	-0.012	0.009***	0.008**
	(0.003)	(0.003)	(0.010)	(0.013)	(0.003)	(0.004)
$TUI_{ct} \times$ Status$_{fct} = 5$	-0.001	0.002	-0.054*	-0.042	0.014*	0.014*
	(0.008)	(0.009)	(0.029)	(0.034)	(0.007)	(0.008)
$TUI_{ct} \times$ Status$_{fct} = 6$	0.010***	0.006	0.100***	-0.025**	0.009***	0.013***
	(0.003)	(0.004)	(0.009)	(0.011)	(0.003)	(0.004)
	Marginal effect of TUI_{ct} at:					
Status$_{fct} = 0$	-0.005***	-0.003***	-0.034***	0.005	-0.005***	-0.003***
	(0.001)	(0.001)	(0.003)	(0.003)	(0.001)	(0.001)
Status$_{fct} = 1$	-0.023**	-0.018	0.049	0.058	-0.002	0.005
	(0.011)	(0.012)	(0.038)	(0.043)	(0.010)	(0.011)
Status$_{fct} = 2$	0.010	0.016	0.125***	0.019	-0.002	0.021
	(0.007)	(0.015)	(0.026)	(0.066)	(0.009)	(0.020)
Status$_{fct} = 3$	-0.003	0.002	-0.028***	0.008	0.002	0.004
	(0.003)	(0.003)	(0.010)	(0.010)	(0.003)	(0.003)
Status$_{fct} = 4$	0.004	0.008***	0.018***	-0.008	0.005**	0.004
	(0.003)	(0.003)	(0.009)	(0.012)	(0.003)	(0.003)
Status$_{fct} = 5$	-0.006	-0.001	-0.088***	-0.038	0.010	0.010
	(0.008)	(0.009)	(0.029)	(0.033)	(0.007)	(0.008)
Status$_{fct} = 6$	0.005***	0.003	0.066***	-0.020**	0.004**	0.009***
	(0.002)	(0.004)	(0.007)	(0.010)	(0.002)	(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 equation (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 $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

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

$$F_{fpct}^{IV} = \min_{\tau} \{F_{fpc,t-\tau}\}_{\tau=1}^{\tau=4} \text{ if } \exists\tau \text{ such that } \{F_{fpc,t-\tau}\}_{\tau=1}^{\tau=4} \neq \emptyset \tag{9}$$

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 changes in 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
Payment in advance	-0.111***	0.019
	(0.026)	(0.020)
Trade credit	-0.015	0.015
	(0.017)	(0.009)
Bank credit	0.166	0.084**
	(0.107)	(0.039)
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	6.679	3.271
F-Test p-value	0.000	0.006
Anderson LM-stat.	3.781	25.829***
Anderson-Rubin F-test	4.570***	2.625*
Anderson-Rubin χ^2-test	23.263***	13.312**
Stock-Wright S stat.	23.260***	13.311*

This table shows the marginal effects of changes in 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 (1) and Equation (2). 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. $^{*}p < 0.10$,$^{**}p < 0.05$,$^{***}p < 0.01$.

Documentos de Trabajo Banco Central de Chile	Working Papers Central Bank of Chile
NÚMEROS ANTERIORES	PAST ISSUES
La serie de Documentos de Trabajo en versión PDF puede obtenerse gratis en la dirección electrónica: www.bcentral.cl/esp/estpub/estudios/dtbc. Existe la posibilidad de solicitar una copia impresa con un costo de Ch$500 si es dentro de Chile y US$12 si es fuera de Chile. Las solicitudes se pueden hacer por fax: +56 2 26702231 o a través del correo electrónico: bcch@bcentral.cl.	Working Papers in PDF format can be downloaded free of charge from: www.bcentral.cl/eng/stdpub/studies/workingpaper. Printed versions can be ordered individually for US$12 per copy (for order inside Chile the charge is Ch$500.) Orders can be placed by fax: +56 2 26702231 or by email: bcch@bcentral.cl.

DTBC – 1027
Navigating trade uncertainty: The role of trade financing and the spillover effects
Mauricio Calani, Paula Margaretic, David Moreno.

DTBC – 983* (Revised)
Effectiveness of Foreign Exchange Interventions: Evidence and Lessons from Chile
Jorge Arenas, Stephany Griffith-Jones.

DTBC – 1026
The Incidence of Distortions
David Atkin, Baptiste Bernadac, Dave Donaldson, Tishara Garg, Federico Huneeus.

DTBC – 1025
Strike while the Iron is Hot - Optimal Monetary Policy with a Nonlinear Phillips Curve
Peter Karadi, Anton Nakov, Galo Nuño, Ernesto Pastén, Dominik Thaler.

DTBC – 1024
Optimal Monetary and Fiscal Policies in Disaggregated Economies.
Lydia Cox, Jiacheng Feng, Gernot J. Müller, Ernesto Pastén, Raphael Schoenle, Michael Weber.

DTBC – 1023
Modelling high frequency non-financial big time series with an application to jobless claims in Chile.
Antoni Espasa, Guillermo Carlomagno

DTBC – 1022
Aggregating Distortions in Networks with Multi-Product Firms
Yasutaka Koike-Mori, Antonio Martner

DTBC – 1021
Análisis de redes aplicado al sistema de pagos de alto valor del BCCh
Álvaro González, Carmen López, María José Meléndez

DTBC – 1020
Financial advisory firms, asset reallocation and price pressure in the FOREX market
Francisco Pinto-Avalos, Michael Bowe, Stuart Hyde

DTBC – 940* (Revised)
Overborrowing and Systemic Externalities in the Business cycle Under Imperfect Information
Juan Herreño, Carlos Rondón-Moreno

DTBC – 1019
Through Drought and Flood: the past, present and future of Climate Migration
Elías Albagli, Pablo García Silva, Gonzalo García-Trujillo, María Antonia Yung

DTBC – 1018
Supply Chain Uncertainty and Diversification
Ignacia Cuevas, Thomas Bourany, Gustavo González

DTBC – 1017
Is the Information Channel of Monetary Policy Alive in Emerging Markets?
Mariana García-Schmidt

DTBC – 1016
The Portfolio Choice Channel of Wealth Inequality
Mauricio Calani, Lucas Rosso

DTBC – 1015
Fiscal Consolidations in Commodity-Exporting Countries: A DSGE Perspective
Manuel González-Astudillo, Juan Guerra-Salas, Avi Lipton

DTBC – 1014
Accounting for Nature in Economic Models
Nicoletta Batini, Luigi Durand

DOCUMENTOS DE TRABAJO Octubre 2024