The Financial Channel of the Exchange Rate and Global Trade

Sai Ma and Tim Schmidt-Eisenlohr*

September 2023

Abstract

This paper provides evidence that the U.S. dollar affects trade through a financial channel of the exchange rate. Using global data over three decades on trade between countries whose currency is not the U.S. dollar, it shows that a dollar appreciation increases import prices and decreases import quantities. In line with a financial channel, these effects are stronger when the exporting country borrows more in U.S. dollars abroad. The financial channel was active before the global financial crisis but has strengthened since. Instrumenting the dollar is key to uncovering the full effect of the financial channel.

Keywords: Dollar, Financial Channel, International Trade, Foreign Borrowing

JEL Classification: F14, F31, F34, G15

---

*Ma and Schmidt-Eisenlohr are from the Division of International Finance, Federal Reserve Board of Governors (sai.ma@frb.gov, t.schmidteisenlohr@gmail.com). We thank Valentina Bruno, Ricardo Correa, Sebnem Kalemli-Ozcan, Luca Guerrieri, Linda Goldberg, and seminar participants at the Federal Reserve Board and 2023 CEA Conference for their comments. The opinions expressed are those of the authors and do not necessarily reflect the view of the Board of Governors or the staff of the Federal Reserve System.

1 Introduction

Changes in U.S. conditions can generate strong spillovers to other countries, not only through direct economic links with the United States but also indirectly through their effects on global financial conditions.[1] A key factor that plays a role in the indirect transmission of U.S. shocks abroad is the U.S. dollar (Obstfeld and Zhou (2023)).

The literature suggests two channels through which the dollar may indirectly affect trade flows and prices. First, Gopinath et al. (2020) show that the dominant role of the dollar in trade invoicing impacts price pass-through and the trade elasticity when prices are sticky in dollars.[2] Second, Bruno and Shin (2023) propose a financial channel of the exchange rate, which posits that dollar appreciations reduce exporters' access to finance, including funding needed for international trade transactions, because they deteriorate financial intermediaries' balance sheets.[3] The decrease in trade-related lending then leads to a contraction in trade flows.

This paper provides evidence for the financial channel of the exchange rate, showing that through it the dollar affected trade in a large set of countries over an extended period, 1990 to 2018. The financial channel was active before the global financial crisis and has strengthened since, in line with recent findings on the dollar and global conditions (Lilley et al. (2022), Obstfeld and Zhou (2023)). Importantly, the analysis shows that instrumenting

[1] A large literature, e.g., studies U.S. monetary policy spillovers. See, among others, Kim (2001), Maćkowiak (2007), Georgiadis (2016), and Fratzscher et al. (2018). For an analysis of broader spillovers, see e.g., Canova (2005). Di Giovanni et al. (2022), link increases in the VIX to reduced bank lending in an emerging economy, Turkey, while Kalemli-Özcan (2019) and Miranda-Agrippino and Rey (2020) document how U.S. monetary policy affects the global financial cycle (GFC).

[2] See also Corsetti and Pesenti (2005), Cook and Devereux (2006), Devereux et al. (2007), Goldberg and Tille (2008), Goldberg and Tille (2009), Canzoneri et al. (2013), and Gopinath (2015).

[3] As discussed in more detail below, the estimates of the financial channel in this paper likely reflect balance sheet effects at the bank level (Bruno and Shin (2023)), the institutional-investor level (Niepmann and Schmidt-Eisenlohr (2023)) and the firm level (Casas et al. (2022)).

the dollar is key to estimating the full effect of the financial channel, and that this effect is separate from the dominant currency invoicing channel.

To identify the financial channel, the paper exploits differences across countries in the extent to which foreign borrowing is denominated in U.S. dollars. The more a country borrows in U.S. dollars abroad, the more it should be affected by swings in the global supply of dollar funding, and hence the financial channel. Because trade is mostly financed by exporters (see e.g. Ahn (2014), Antràs and Foley (2015), Demir and Javorcik (2018) and Garcia-Marin et al. (2019)), the *exporting country's dollar borrowing share* should best capture the effect of the financial channel of the exchange rate on trade prices and quantities.[4] That is, exports of countries with larger U.S. dollar borrowing should be more adversely affected by a dollar appreciation than exports of other countries. Because importer finance is much less important in international trade, the importer U.S. dollar borrowing share should have a much weaker or no effect on trade flows. This contrasts with the invoicing channel developed in Gopinath et al. (2020), which is only operative on the importer side: prices that are sticky in dollars generate an asymmetry, where only import prices and quantities respond to the *importing country's dollar invoicing share* and dollar exchange rate. The analysis here exploits this difference between the two mechanisms by estimating the financing channel of the exchange rate on the exporter side, while fully controlling for the effects of the invoicing channel on the importer side through importer-year fixed effects.

A simple OLS regression that explains export prices and quantities by the dollar exchange rate and its interaction with the exporting country's dollar share in foreign borrowing un-

[4]Available customs data with payment information that cover the universe of trade transactions for Turkey, Chile, and Colombia show that trade credit represents at least 80 percent of international trade flows. Antràs and Foley (2015) who study data for one large U.S. food exporter find a more balanced split between trade credit and cash in advance for sales by that firm.

covers a small price effect but does not show significant effects for quantities. However, a key challenge in testing for the effect of the dollar on trade prices and quantities is the endogeneity of the U.S. dollar. As macroeconomic variables, trade flows, and the dollar are codetermined, it is difficult to identify the financial channel of the exchange rate in a simple OLS setting.

To tackle this issue, this paper instruments the dollar with domestic housing activity in the United States, building on recent research by Ma and Zhang (2023), who show that this variable can predict the dollar one year ahead. U.S. housing activity represents a particularly well-suited instrument for the question studied in this paper, as trade between third countries is unlikely to be directly affected by changes to the domestic demand and supply for U.S. housing.[5]

When the U.S. dollar is instrumented by the one-year lagged number of new housing permits in the United States, the estimated relationships between the dollar exchange rate, import prices, and import quantities strengthen substantially relative to the OLS results. Estimated effects for the interaction between the exporting country's dollar share in foreign borrowing and the dollar exchange rate for both import prices and import quantities are highly significant. Moreover, the estimated interaction term coefficients are much larger when using a two-stage least squares (2SLS) approach. For import prices, the coefficient is slightly below one, whereas the interaction coefficient for import quantities is below minus one, which is consistent with the price effect when assuming a trade elasticity greater than one. Results are robust to controlling for exporting countries' trade links with the United

[5]This instrumentation strategy is also used in Ma et al. (2020) to revisit the dominant currency paradigm estimation in Gopinath et al. (2020).

States, macro, financial, and risk variables, using alternative proxies for U.S. housing activity, and splitting the data into subsamples. The sub-sample analysis also reveals that the financial channel was active before the global financial crisis and has strengthened since. Replacing the U.S. dollar share in the exporting country's foreign borrowing by the exporting country's ratio of net U.S. dollar liabilities over GDP leads to very similar results. Finally, results persist when restricting the sample to industries that are unrelated to construction.

The paper contributes to the literature that studies the link between financial conditions and trade. The general link between financial constraints and trade has been studied, for example, by Kletzer and Bardhan (1987), Manova (2013), and Chaney (2016), who show that financial constraints can affect exporting both at the extensive and intensive margin. Several papers have shown how financial shocks affect trade flows both during crisis periods and in normal times (see e.g., Amiti and Weinstein (2011), Paravisini et al. (2015), Niepmann and Schmidt-Eisenlohr (2017b), and Ahn and Sarmiento (2019)). Finally, a set of papers has studied how financial conditions and other factors make firms choose the payment terms for international trade, that is, the choice between exporter, importer, and bank-led finance (see Schmidt-Eisenlohr (2013), Ahn (2014), Antràs and Foley (2015), Hoefele et al. (2016), Niepmann and Schmidt-Eisenlohr (2017a), Demir and Javorcik (2018), and Garcia-Marin et al. (2020)).

More specifically, this paper speaks to the role of the dollar as a driver of global trade. As stated above, its findings are very consistent with evidence on the financial channel of the exchange rate and balance sheet effects in Bruno and Shin (2023) and Casas et al. (2022).[6]

[6]On the broader effect of the dollar exchange rate on lending in the United States and abroad, and on the

The analysis here adds to the evidence in these earlier papers along three dimensions. First, it goes beyond the cases of Mexico and Colombia and studies the financial channel in a large set of countries, thereby confirming the relevance of the financial channel at the global level. Second, this study covers a much longer sample period that runs from 1991 to 2018 (compared to 2011-2017 in Bruno and Shin (2023) and 2008-2018 in Casas et al. (2022)). Importantly, this longer sample period allows for documenting the presence of the financial channel in the period preceding the global financial crisis (GFC). At the same time and in line with recent work on the dollar and global conditions (Lilley et al. (2022), Obstfeld and Zhou (2023)), the analysis reveals that the effects of the dollar have become notably stronger in the post-GFC period. Third, this paper addresses the endogeneity of the dollar by instrumenting the dollar by U.S. housing activities. The results confirm that instrumenting the dollar is key to fully capturing the financial channel of the exchange rate.

As discussed above, the second channel through which the dollar may affect trade indirectly is the currency invoicing channel or dominant currency channel (Gopinath et al. (2020)). Robustness checks confirm that the findings on the financial channel persist when controlling for this complementary channel.[7]

The financial channel analyzed in our paper is closely linked to research on balance sheet effects and firm outcomes. Aguiar (2005), Kim et al. (2015), Kalemli-Ozcan et al. (2016), and Hardy (2018), for example, show how a depreciation of the local currency worsens outcome variables such as investment and firm performance. In a similar vein, Bruno and

link between the dollar and financial intermediary constraints, see also Avdjiev et al. (2019) and Niepmann and Schmidt-Eisenlohr (2023).

[7]Recent other contributions on the dominant status of the dollar include Amiti et al. (2020) who study the invoicing choices of Belgian firms, Corsetti et al. (2020) who look at the implications of a dominant currency for the transmission of shocks across borders and optimal monetary policy, and Goldberg and Tille (2016) who analyze vehicle currency invoicing with Canadian transaction-level import data.

Shin (2020), Alfaro et al. (2021), and Niepmann and Schmidt-Eisenlohr (2022) document how exchange rate moves can influence a firm's stock market price, fragility, and repayment probability, respectively. Considering balance sheet effects in 14 emerging economies, Du and Schreger (2022) show that more corporate foreign currency borrowing is associated with higher sovereign default risk.

Finally, the paper also adds to the sizable literature on exchange rate pass-through, which has shown that pass-through depends on factors such as the frequency of price adjustments (Gopinath and Itskhoki (2010)), the strength of competition in final product markets (Amiti et al. (2016)), firms' export or import market shares (Feenstra et al. (1996), Berman et al. (2012), Amiti et al. (2014), Garetto (2016), Auer and Schoenle (2016), Devereux et al. (2017)), and the source of exchange rate shocks (Forbes et al. (2018)). The global nature of the exercise, which aims to capture most world trade between third countries, does not allow to directly account for these factors at the micro level. Its contribution to this literature should therefore be seen in showing that the financial channel of the exchange rate affects trade prices and in providing an estimate of this effect at the global level.

The paper proceeds as follows. Section 2 discusses the conceptual framework, the empirical specifications, and the instrumental variable approach. Section 3 explains the data. Section 4 presents results and robustness, and Section 5 concludes.

2 Framework, Specifications, and IV Approach

This section discusses the conceptual framework, presents the main empirical specifications on import prices and quantities, and discusses the instrumental variable approach.

2.1 Conceptual Framework

Definitions Suppose there are three countries: the United States, country i, and country j. Let $e_{ij,t}$ denote the price of currency i in units of currency j and $e_{\$j,t}$ the price of the dollar in units of currency j — that is, an increase in $e_{\$j,t}$ reflects an appreciation of the dollar.

The financial channel of the exchange rate. The key prediction of the financial channel is that dollar appreciation leads to tighter financial conditions because of balance-sheet effects: A dollar appreciation raises the risk of dollar loans and bonds of borrowers with non-dollar income and insufficient hedges, i.e., to firms whose balance sheets feature currency mismatches.[8] This increase in risk reduces the risk-taking capacity of the financial sector and thereby lending to firms, which may lead to a reduction in real activity including international trade. Bruno and Shin (2015) derive this prediction in a model where banks have leverage constraints that limit their lending.

However, the transmission of the dollar to tighter credit conditions in the exporting country does not have to go through mismatched bank balance sheets (Bruno and Shin (2015)) alone. It can also operate through the mismatches on the balance sheets of global financial intermediaries or institutional investors, whose balanced sheets might become more constrained when the dollar appreciates, thereby tightening global financial conditions and bank lending (Niepmann and Schmidt-Eisenlohr (2023)). At the same time, as shown by Casas et al. (2022), balance sheet effects also operate at the firm level. The estimates in this paper should therefore be seen as capturing the general effect of the dollar on trade prices

[8] Niepmann and Schmidt-Eisenlohr (2022) show that dollar appreciations indeed increase the risk of dollar loans to foreign borrowers.

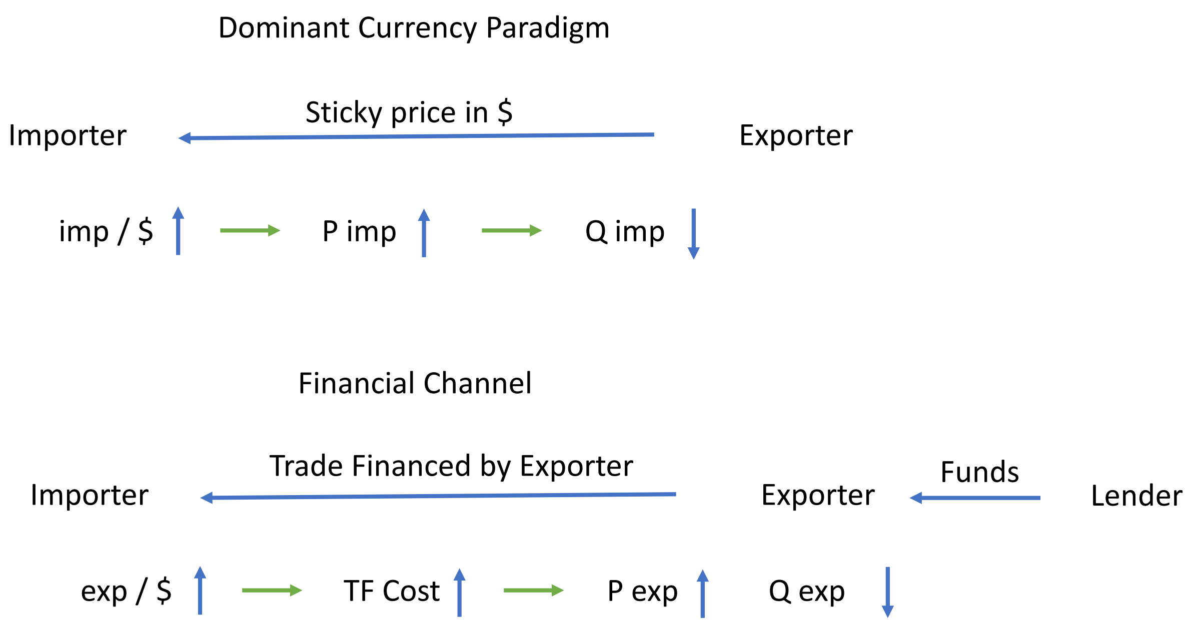
and quantities through the financial channel of the exchange rate, encompassing balance sheet effects at the firm-, bank-, and global investor level.

A contraction in lending because of balance sheet effects should lower trade quantities and increase trade prices, as international trade requires large amounts of bank lending, both for working capital loans and for more specific trade finance products like letters of credit. As most trade is financed by exporters, this channel should mainly operate through constraints in the exporting country.

Comparison to the dominant currency paradigm Figure 1 compares the dominant currency mechanism with the financial channel. Under the dominant currency paradigm, prices are sticky in U.S. dollars. Then, an appreciation of the dollar against the importer's currency raises import prices in local currency and thereby leads to a decline in import quantities. Under the financial channel, exporters need to finance trade transactions by borrowing from external lenders. The financing cost of these lenders increases when the dollar appreciates against the exporter's currency. This generates an increase in trade finance costs for exporters, which raises export prices and lowers export quantities. As discussed above, there may be an additional effect due to currency mismatches on the exporting firm's balance sheet (as in Casas et al. (2022)). Then, a dollar appreciation also tightens constraints at the firm level, reducing the funds available for trade finance, which further raises export prices and lowers export quantities.

The dominant currency paradigm operates through price effects in the importing country that only depend on the importer's dollar invoicing share and exchange rate, while the financial channel should mostly operate through the exporter's financial conditions. It is therefore feasible to fully control for the effects from the dominant currency paradigm in the empirical specification through importer-year fixed effects, while still estimating the effects of the financial channel.

Figure 1. Effect of Dollar Appreciation



Classic channels generate no or opposite effect There are two classic channels that also link exchange rate movements to trade. First, the expenditure-switching channel (Mundell (1968)) implies that if exporters price exports in their own currency (producer currency pricing), a depreciation against the other country's currency should shift demand towards domestic goods, decreasing imports and increasing exports. However, as the analysis in this paper only looks at countries that do not have the dollar as their currency, the expenditure-switching channel is muted.[9] Second, if a country has a negative net asset position in dollars, a depreciation of the local currency against the dollar will generate a negative wealth effect

[9]Specifically, the expenditure-switching channel is driven by the bilateral rate between the exporter and the importer, but unaffected by the exchange rate between the dollar and the exporter's currency.

(Ghironi et al. (2007), Tille (2008)). This lowers domestic consumption and thereby decreases imports and increases exports.

To sum, in the present setting that focuses on third-country trade, the classic channels either predict no response to the dollar (expenditure-switching channel) or a response with the opposite sign (wealth effect) from the financial channel of the exchange rate.

2.2 OLS Specifications

This section presents the OLS specifications for import prices and import quantities.

Import Prices. The relationship between the dollar and import prices is estimated through the following equation:

$$\begin{aligned}\Delta p_{ij,t} &= \beta\Delta e_{ij,t} + \beta^{\$}\Delta e_{\$j,t} + \eta\Delta e_{ij,t}\times S^{Fin}_{j,t-1} + \eta^{\$}\Delta e_{\$j,t}\times S^{Fin}_{j,t-1} \\ &\quad +\theta X_{j,t} + \lambda_{ij} + \delta_t + \varepsilon_{ij,t} \qquad (1)\end{aligned}$$

where $\Delta p_{ij,t}$ is the log difference of the price of goods exported from country j to country i measured in importer currency i, and $S^{Fin}_{j,t-1}$ is the lagged dollar share of exporting country j's foreign borrowing in country j's total foreign borrowing. All specifications include dyadic and time fixed effects, λ_{ij} and δ_t. Controls, $X_{j,t}$, include changes in the (log) producer price index in the exporting country j.[10]

Import quantities. For import quantities, the following specification is estimated:

[10] Results are very similar when implementing the dynamic specification in Gopinath et al. (2020) by including two lags of the (log) producer price index as well as two lags of the bilateral exchange rate, as shown in Table 11.

$$\Delta y_{ij,t} = \beta \Delta e_{ij,t} + \beta^{\$} \Delta e_{\$ j,t} + \eta \Delta e_{ij,t} \times S^{Fin}_{j,t-1} + \eta^{\$} \Delta e_{\$ j,t} \times S^{Fin}_{j,t-1}$$
$$+\theta X_{i,t} + \lambda_{ij} + \delta_t + \varepsilon_{ij,t}, \tag{2}$$

where $\Delta y_{ij,t}$ is the log difference in bilateral import quantities. Import quantity regressions also include dyadic and time fixed effects, λ_{ij} and δ_t. Controls, $X_{j,t}$, include the growth rate of the real GDP of the importing country i.[11]

2.3 IV Approach

The key challenge in testing for the effect of the dollar on trade prices and quantities is that the exchange rates are co-determined with other macroeconomic factors that also move trade prices and quantities. To test for the causal relationship of the dollar on trade hence requires a shock that moves the exchange rate but does not directly affect trade prices and quantities between two countries other than through the exchange rate. The following paragraphs discuss why U.S. domestic housing activity represents such a shock. They present evidence that U.S. housing activity can forecast moves in the dollar one year ahead and explain why the lag of U.S. housing activity is plausibly exogenous to the bilateral trade between two countries other than the United States.

U.S. housing cycles and the dollar. Ma and Zhang (2023) uncover that U.S. housing activity, such as residential investment and building permits, is a strong in-sample and out-of-sample predictor for the dollar up to three years. Table 1 reflects this central finding from

[11] Again, results are very similar when implementing the dynamic specification in Gopinath et al. (2020) by including two lags of the growth rate of the real GDP of the importing country as well as two lags of the bilateral exchange rate, as shown in Table 11.

Ma and Zhang (2023), showing regressions of the one-year-ahead dollar on different measures of U.S. housing activity. The coefficient in column (1) implies that a one standard deviation increase in building permits is associated with a three percent decline in the value of the dollar the next year. This result is robust to the inclusion of variables that capture financial conditions and U.S. monetary policy (columns (2) and (3)) and works with alternative measures of U.S. housing activity (columns (4) and (5)).

Figure 2 illustrates this result graphically. It shows the time series of the total number of building permits authorized in the United States and the one-year-ahead log change in an average dollar index. The two series exhibit a 33 percent negative correlation, confirming that stronger U.S. housing activity predicts persistent future dollar depreciation. Ma and Zhang (2023) show that U.S. housing variables also predict the dollar out of sample and outperform the random walk model.

One plausible explanation for why U.S. housing activity affects the future price of the dollar is through its effect on the relative supply of traded and non-traded goods, as housing is one of the most important non-traded goods. Ma and Zhang (2023) propose a model where the price of the traded good is determined globally, but the domestic price of the non-traded good is mostly determined by domestic supply and demand. In that setting, output fluctuations in the domestic non-traded good can generate strong adjustments in the relative price between the non-traded and the traded good, and, hence, affect the value of the dollar. This mechanism is known as the relative price adjustment channel. They show empirically that increases in U.S. domestic housing investment indeed predict persistent declines in the relative price of the non-traded price measure from Betts and Kehoe (2008).

One concern for the documented predictability is that because the U.S. housing cycle is often considered to co-move with macro and financial conditions, the relationship might reflect general business and credit cycles. Panel B of Table 1 reports results from the dollar forecasting regression with additional macro and financial controls. It first adds two business cycle predictors: the excess bond premium from Gilchrist and Zakrajšek (2012), which is based on credit spreads, and the slope of the Treasury yield curve, measured by the term spread. Second, it adds the credit-to-GDP ratio and the broker-dealer leverage to capture credit cycles. The analysis then follows Dahlquist and Pénasse (2022) and controls for the level of the real exchange rate to capture its potential mean reversion. Finally, there is a "kitchen sink" specification that includes all control variables at the same time. Consistent with Ma and Zhang (2023), results in Table 1 show that the dollar predictability remains strong even after controlling for all these variables jointly.

Another concern is that international capital flows might jointly affect the U.S. current account balance and the U.S. housing cycle, as remarked in Bernanke (2005). As a result, U.S. housing activity could be a proxy for international capital flows into the United States. However, Lilley et al. (2019) find that international capital flows were disconnected from exchange rate fluctuations in the period before 2007. Despite this pre-GFC exchange rate disconnect, the housing-dollar relationship is already present in the pre-crisis sample that starts in 1990. In addition, Ma and Zhang (2023) find that various measures of international capital flows cannot explain the ability of housing investments to predict the dollar.

The analysis considers two alternative measures of U.S. housing activity besides U.S. building permits. The first one is housing starts obtained from the Survey of Construction (SOC). Housing construction is a lengthy process and obtaining a building permit is the first step in this process.[12] Building permits are a measure of potential home construction starts, as not all permits lead to a construction start. Housing starts, in contrast, directly count new home constructions that are started in each period. The second alternative measure is private residential fixed investment (PRFI). In contrast to permits and housing starts, which are count variables, PRFI measures investment expenditures in dollar terms. While the advantage of count measures is that they are insulated from housing price fluctuations, they cannot capture quality improvements in real estate. To normalize the variable over time, PRFI is scaled by concurrent gross domestic private investment (GDPI). Ma and Zhang (2023) show that both alternative measures, housing starts and PRFI/GDPI, can robustly predict the dollar in sample and out of sample for up to 12 quarters (see also columns (4) and (5) of Table 1).

While U.S. *domestic* housing capital investment is highly correlated with future dollar movement, one would not expect domestic U.S. housing activity to directly affect trade between other countries. The two-country model proposed by Ma and Zhang (2023) implies that a change in the relative price between the traded and the non-traded goods in the United States affects U.S. trade with the other country. If a third country is added to this framework, changes in U.S. trade could indirectly affect bilateral trade between the other two countries. Importantly, this indirect effect should be stronger for countries that have stronger trade links with the United States. To address this concern, the robustness analysis directly controls for this indirect trade channel by including exporting countries' trade shares with the United States and the interaction of this variable with the dollar in the regression.

[12] According to the 2016 Survey of Construction, the average time for the construction of a new single-family home is six months.

Adding these controls does not affect results.

Implementation In the 2SLS specification, the exchange rate, $\Delta e_{\$j,t}$, is instrumented by the lagged number of U.S. housing permits issued, both for the direct effect as well as for the interaction term between the dollar and the dollar borrowing share. All regressions, unless noted otherwise, include time and dyad fixed effects. The main tables also include specifications with importer-year fixed effects. Including importer-year fixed effects allows us to estimate the financial channel on the exporter side while fully controlling for effects at the importer-year level, which, among others, fully absorbs the invoicing currency channel (Gopinath et al. (2020)). We also consider a battery of additional robustness checks, including alternative housing instruments and various sub-periods.

3 Data

The trade data are from two separate sources. Data for annual import prices and quantities at the country-pair level are from Gopinath et al. (2020), who construct these aggregate series from UN Comtrade data at the Harmonized System (HS) six-digit product level. For the baseline estimates at the dyad level, following Gopinath et al. (2020), the trade data exclude commodities that are broadly defined as HS chapters 1 to 27 and 72 to 83, which comprise animal, vegetable, food, mineral, and metal products. Robustness checks as well as regressions at the product level also look at samples that include products classified as commodities. Data at the HS6-product-level is from the CEPII-BACI database (Gaulier and Zignago (2010)), which provides a cleaned version of the UN Comtrade data to researchers.

The data on US housing activity, including building permits, are from the Building Permits Survey conducted by the Census Bureau. U.S. private residential fixed investment data are from the national income and product accounts Table 1.1.5 (line 13). Housing starts are obtained from the Survey of Construction conducted by the Census Bureau.

Data on the dollar share of foreign borrowing are from Bénétrix et al. (2019), who provide the currency composition of the international investment position for a group of 50 countries for the period 1990 to 2017. The main measure of foreign dollar funding, a country's share of external debt liabilities in U.S. dollars, is directly reported in the data set. The alternative measure, the ratio of net dollar liabilities over GDP, is constructed from the same data. Currency invoicing shares for each importer are from Boz et al. (2020).

The final sample includes 43 exporting countries, over 2,400 dyads that cover more than 90 percent of world trade, and runs from 1991 to 2018.[13, 14] The aggregate data have about 40 thousand dyad-year level observations and the product level data have about 30 million HS6-level observations. The average dollar share in foreign borrowing in the sample is 0.44. The five countries with the highest dollar borrowing shares are (in descending order) Chile, Brazil, Colombia, Philippines, and Argentina, while the five countries with the lowest dollar borrowing shares are (in ascending order) Germany, Czech Republic, Italy, Greece, and Austria.

[13]Several dollar pegging and managed exchange rate economies are dropped from the sample, including China, Hong Kong, Saudi Arabia, Singapore, and Vietnam in the final sample. However, results are similar when including these economies.

[14]The sample period is constrained by the availability of data on the foreign currency share of borrowing from Bénétrix et al. (2019), which runs from 1990 to 2017. As we are using a one-year lag of the foreign currency share, the final sample runs from 1991 to 2018.

4 Empirical Analysis

This section presents the results on the financial channel of the exchange rate at the aggregate and product-level and discusses their robustness.

4.1 Aggregate Results

This subsection presents the main results from regressions at the country-pair-year level for import prices and quantities and reports robustness analysis using the alternative measure of dollar funding exposures.

Import Prices. Columns (1) and (4) of Panel A of Table 2 report OLS estimates based on equation (1), while columns (2) and (5) report first stage estimates and columns (3) and (6) report second stage estimates from the IV analysis. To conserve space, for each column, only coefficients for $\Delta e_{ij,t}$ (changes in the bilateral exchange rate at time t) and $\Delta e_{\$j,t}$ (changes in prices of the dollar in currency j at t), as well as interaction terms between the lagged exporting country's dollar share in foreign borrowing, $S^{Fin}_{j,t-1}$, and the exchange rate changes, $\Delta e_{ij,t}$ and $\Delta e_{\$j,t}$, respectively, are reported.

The OLS regression (column (4)) suggests that the dollar share in foreign borrowing plays a role in the dollar pass-through: a 10 percent dollar appreciation is associated with a 1.6 percent increase in import prices if the exporting country only borrows abroad in dollars. However, the 2SLS estimate (column (6)) shows that the effect of the dollar borrowing share on the dollar pass-through is in fact much larger. Once the dollar is instrumented by U.S. housing activity, a 10 percent dollar appreciation is linked to a 6.8 percent increase in import prices, an effect more than four times larger than the OLS estimate. The large change in the coefficient size when moving from OLS to 2SLS implies that the endogeneity of the dollar biases the estimated OLS coefficients strongly toward zero.[15] Column (7) reports results when importer × year fixed effects are added. Including these fixed effects fully controls for the invoicing currency channel (Gopinath et al. (2020)) and any other channels that operate at the importer-year level. The interaction term between the dollar and the exporter's dollar borrowing share remains statistically significant and quantitatively similar to the estimate with time fixed effects only. This confirms that the financial channel has an important role for the dollar pass-through that is independent of the invoicing channel.

To detect the strength of the instrument, columns (2) and (5) also report the F-statistics from the first-stage regression. As the first-stage regressions only exploit variation at the exporter-time level, the reported F-statistics are clustered at that level. The large F-statistics in all specifications are consistent with the strong predictive power of U.S. housing activity for the dollar uncovered in Ma and Zhang (2023).

Results on import quantities. Columns (1) and (4) of Panel B of Table 2 report the OLS estimates based on equation (2), while columns (2) and (5) report the first-stage estimates and columns (3) to (6) report the second stage estimates from the IV analysis. The OLS regression (column (4)) yields a negative interaction term between the dollar and the lagged dollar borrowing share S_j^{Fin}, suggesting that a dollar appreciation has a more negative effect on the trade volume for importers with a larger dollar borrowing share. However, this

[15] Of note, while the OLS specification in column (4) allows estimating the effect of changes to country j's dollar exchange rate, $\Delta e_{\$j,t}$, this variable drops out in the IV estimation in column (6). This is the case because our instrument for the dollar, U.S. housing permits, only varies at the time level. The predicted exchange rate therefore gets absorbed by the time fixed effects. In contrast, the coefficient for the interaction between the dollar and the exporting country's lagged dollar share in foreign borrowing can be estimated in column (6), as it varies at the country-year level.

relationship is not precisely estimated, as the coefficient is insignificant at conventional levels.

Once the dollar is instrumented (column (6)), this relationship becomes highly statistically significant, and the coefficient becomes much larger, with an estimated value of negative 1.1. Column (7) shows that results remain quantitatively similar when importer times year fixed-effects are included, indicating that the financial channel has a notable effect on trade quantities that is independent of the currency invoicing channel.

Size of foreign dollar borrowing. The baseline estimation uses an exporting country's dollar borrowing share to capture its reliance on foreign dollar funding. However, this share does not take the size of foreign borrowing into account. For example, some countries could have high dollar borrowing shares but small or even negative net dollar liability positions (relative to their GDP). To address this concern, consider the following extension of equations (1) and (2):

$$\begin{aligned}\Delta Y_{ij,t} \quad = \quad & \beta \Delta e_{ij,t} + \beta^{\$} \Delta e_{\$j,t} + \eta \Delta e_{ij,t} \times \frac{L^{USD}_{j,t-1} - A^{USD}_{j,t-1}}{GDP_{j,t-1}} + \eta^{\$} \Delta e_{\$j,t} \times \frac{L^{USD}_{j,t-1} - A^{USD}_{j,t-1}}{GDP_{j,t-1}} \\ & + \eta^{OTH} \Delta e_{ij,t} \times \frac{L^{OTH}_{j,t-1} - A^{OTH}_{j,t-1}}{GDP_{j,t-1}} + \eta^{OTH} \Delta e_{\$j,t} \times \frac{L^{OTH}_{j,t-1} - A^{OTH}_{j,t-1}}{GDP_{j,t-1}} \\ & + \theta X_{j,t} + \lambda_{ij} + \delta_t + \varepsilon_{ij,t} \end{aligned} \tag{3}$$

where $\Delta Y_{ij,t}$ is either the log difference of the price of goods exported from country j to country i measured in importer currency i or the log difference in bilateral import quantities.[16] $L^{USD}_{j,t-1} - A^{USD}_{j,t-1}$ is country j's net liability positions denominated in the US dollar and

[16]All regressions also include dyadic and time fixed effects λ_{ij} and δ_t, and same controls $X_{j,t}$ as specified in equations (1) and (2).

$L^{OTH}_{j,t-1} - A^{OTH}_{j,t-1}$ are net positions denominated in all other currencies other than the dollar.

Table 3 reports the estimates of equation (3) for trade prices and quantities. The IV estimates reported in columns (2) and (8) are quantitatively similar to those in column (6) of Table 2 that uses the dollar share of foreign borrowing. A 10 percent increase in the dollar is linked to a 6.6 percent increase in import prices, and an 11.7 percent drop in import quantities. These relations are statistically significant in the IV specifications, whereas the OLS estimations (columns (1) and (7)) only show significant effects for prices but not for quantities. Columns (3) and (9) further show that the results remain statistically significant, with similar magnitude, when importer-year fixed effects are included.

Columns (5) and (11) report estimates for trade prices and quantities from regressions that add interactions between the dollar and the ratio of an exporting country's net liabilities in other currencies over GDP. Results indicate that the size of net liability positions in other currencies over GDP plays no role in the dollar pass-through to trade prices: columns (5) and (6) show that the relevant coefficients remain insignificant even when the change in the dollar is instrumented. For trade quantities, similarly, columns (11) and (12) show that net positions in non-dollar currencies over GDP play little role. Although coefficients for the interaction terms with dollar changes are statistically significant, they are about 80 percent smaller than the corresponding coefficients for net dollar positions over GDP. Again, results are similar when including importer-year fixed effects.

To sum up, results are comparable when using net dollar liabilities over GDP instead of the dollar share of foreign borrowing in the regressions. The findings on the financing channel of the exchange rate are hence robust to the specific way in which countries' reliance on global dollar funding is measured.

4.2 Product-level evidence

This subsection presents evidence from data at the HS6-digit product-dyad-year level. Results are presented in Tables 4 and 5. Similar to the analysis at the dyad-year level, the tables present both OLS and 2SLS results. In addition, the regressions include HS6-product fixed effects. The results indicate that, in line with the evidence at the dyad level, the dollar share in foreign borrowing plays a significant role in the dollar pass-through: the 2SLS specification in column (4) implies that a 10 percent dollar appreciation is linked to a 5 percent increase in import prices if the exporting country only borrows abroad in dollars, which is close to the estimate reported in Table 2. This positive relation is statistically significant at any conventional level. Similarly, column (4) of Panel B shows that a 10 percent dollar appreciation leads to a 14 percent decrease in trade quantity. These findings, at a more granular level, reinforce the evidence for the financial channel of the dollar on global trade.

Instrument exogeneity check: non-housing products. One potential concern is that the housing instrument might reflect the demand for housing-related products, such as construction materials or equipment, which could directly affect the trade quantities and prices of these products between third countries. To alleviate this concern, equations (1) and (2) are re-estimated at the product level with a restricted sample of products that are plausibly unrelated to housing. The non-housing products include food such as dairy products, cereals, and sugar, pharmaceutical products, and agriculture products such as cotton. U.S. housing investment should not directly affect trade prices or quantities of these unrelated products between third countries. Table 5 reports the results from both OLS and IV estimations. Similar to the product-level estimation discussed in the previous subsection, regressions include year and HS6 fixed effects. The results indicate that, in line with the main results reported above, the dollar share in foreign borrowing plays a significant role in the dollar pass-through in trade prices and quantities. Column (4) in both panels shows that a 10 percent dollar appreciation is linked to a 7 percent increase in import prices and a 39 percent decrease in trade quantity. These relations are statistically significant at any conventional level. The results on non-housing products show that our IV results are not driven by products whose demand or supply is driven by U.S. housing investment.

4.3 Additional Robustness Checks

This subsection discusses several additional robustness checks. First, it shows that results are robust to controlling for the exporting countries' trade links with the United States. Second, it documents that the instrumental variable approach continues to work when controlling for U.S. monetary, financial, and risk conditions. Third, it presents additional robustness checks that look at different subperiods and alternative proxies for U.S. housing activity. In all robustness tables, Panel A presents results on import prices, and Panel B presents results on import quantities. In all cases, we report results with and without interaction terms between the dollar and the dollar share in foreign borrowing. For the latter case, like in Table 2, the dollar term $\Delta e_{\$j,t}$ drops out in the 2SLS estimation with time fixed effects.

U.S. trade links. U.S. housing activity could, through its effects on U.S. trade, indirectly affect trade between third countries. Such indirect effects should be stronger for countries with tighter trade links with the United States. To address this issue, we calculate the ratio of an exporting country's imports and exports from the United States over its total imports and exports. We then add interaction terms of this variable with the dollar and bilateral exchange rates in our OLS and IV regressions.[17] As shown in Table 6, for both import quantities and import prices, results are very similar to the estimates without controlling for the trade links with the United States.

Controlling for monetary conditions and financial & risk factors. One may be concerned that the housing instrument predicts the dollar because it reflects U.S. monetary conditions or financial and risk factors. While housing market activity is certainly associated with U.S. monetary and financial conditions, Ma and Zhang (2023) show that neither can explain the *predictability* of the dollar.

To provide robustness in our context, we add financial and risk factors and variables reflecting U.S. monetary policy, as well as interactions of these variables with the dollar share of foreign borrowing to the regressions. To capture financial and risk factors, we consider an extensive list of related variables studied in the literature, including the implied volatility for the S&P 500 index (VIX); the corporate bond credit spread, measured as the difference between Moody's Baa and triple A corporate bond rates; the effective broad Japanese yen exchange rate; the global dollar factor from Verdelhan (2018); the world recession probability from Cuba-Borda et al. (2018); the intermediary capital ratio factor from He et al. (2017); and macro uncertainty from Jurado et al. (2015). We capture monetary conditions with the 2-year Treasury rate, the Treasury spread, the difference between the 10-year and 2-year Treasury rates, and the median forecast of the 3-month T-bill rate from the Survey of

[17] For some countries, like Chile and Colombia, U.S. trade represents a large fraction of total trade, with shares above 12 percent. In contrast, for other countries like the Euro area countries Germany, France, and Italy, trade with the United States is less important, with shares below 6 percent.

Professional Forecasters.

Table 7 reports the results. All columns in the table report the second-stage results of our 2SLS estimation. In columns (1) and (2), we control for the financial and risk factors; in columns (3) and (4), for the monetary variables; and in the last two columns, for all financial, risk, and monetary variables. We find that in all cases, the interaction terms between the dollar and the dollar share in foreign borrowing remain statistically significant and quantitatively similar to the baseline estimates. This finding implies that the 2SLS results are not driven by any relationship between U.S. housing activity and U.S. monetary conditions nor by financial and risk factors.

Subperiods. The 2007–09 Global Financial Crisis (GFC) ended a great boom and bust cycle for the U.S. housing market. As depicted in Figure 2, U.S. building permits rose sharply before the GFC and then dropped to a historical low in 2009. Are our results driven by the boom-and-bust cycle of the U.S. housing market around the GFC? To answer this question, Table 8 reports 2SLS results that are estimated over several subperiods of our sample. The first two columns report the estimates when we exclude the GFC years 2007 to 2009 from our sample, columns (3) and (4) present results for the pre-2007 sub-sample, and columns (5) and (6) report estimates for the post-2009 subsample. The table has three key takeaways. First, as columns (1) and (2) show, results remain highly significant and of similar magnitude when excluding the GFC from the sample. Second, the financial channel is present both in the pre- and the post-GFC samples. Third, effects are notably larger for the post-GFC period compared to the pre-GFC period, in line with recent evidence that the link between the dollar and other financial and real variables has been strengthening over time (Lilley et al. (2022), Obstfeld and Zhou (2023), and Niepmann and Schmidt-Eisenlohr (2023)).

Alternative housing instruments. We also check the robustness to using different measures of housing activity, with results reported in Table 9. The first two columns show that results remain robust when we include up to three-year lags of building permits as instruments for the dollar exchange rate. Columns (3) to (4) present results when the dollar is instrumented by residential investment (PRFI) scaled by gross investment (GDPI), while columns (5) to (6) report results when the dollar is instrumented by housing starts. We find that both alternative instruments generate results similar to our baseline.

Controlling for the importing country's dollar invoicing share. Next, we check if our results persist in a regression that also includes the dollar invoicing channel in Gopinath et al. (2020). Note that our earlier regressions with importer-year fixed effects fully absorbed this channel. To include the invoicing channel, we add an additional interaction term between the dollar invoicing share of the importing country and the importing-country dollar exchange rate to the regression (the exact variable used in Gopinath et al. (2020)). Results are presented in table 10. Coefficient estimates are very similar to those in table 2. Columns (3) and (6) of table 10 confirm our baseline findings on the financial channel of the exchange rate, namely that import prices rise and import quantities decline with the dollar in proportion to the exporting country's dollar share in foreign borrowing.

Commodities In the baseline estimation, our sample only includes non-commodities following Gopinath et al. (2020). However, commodities could be particularly sensitive to shortages in global dollar funding. To test this hypothesis, columns (1) - (4) of Table 11 report results when including commodities in the sample. Specifically, columns (1) and (2) report IV estimates using commodities that are defined as HS chapters 1 to 27 and 72 to 83. Columns (3) and (4) show results when we include both commodities and non-commodities. Columns (1) - (4) of Table 11 show that our findings are robust to the sample that includes commodities. The interaction terms between the dollar and financing share are positive (negative) and statistically significant for the price (quantity) regressions at any conventional level. In addition, compared to non-commodities, the magnitudes of the dollar interaction coefficients are larger (in absolute value) for commodities. This finding is consistent with the view that commodity trade is particularly finance-dependent. At the same time, the result is particularly striking considering the well-known negative correlation of the dollar and commodity prices (Obstfeld and Zhou (2023)) that also shows up as a negative coefficient in column (1) of panel A.

Broad dollar index and dynamic specifications Columns (5) and (6) of Table 11 show that our IV results are robust to the use of the broad dollar index in place of the bilateral exchange rate between the dollar and exporter currency. While the OLS estimate is not statistically significant when the dollar index is used, the IV estimate reported in Column (6) is highly significant. It implies that a 10 percent appreciation in the broad dollar leads to a 17 percent increase in import prices and a 22 percent decrease in trade quantities. Finally, columns (7) and (8) report results when we follow the dynamic specification in Gopinath et al. (2020) by additionally including two lags of the independent variables. More specifically, the price regression becomes (with the quantity regression being analogous):

$$
\begin{aligned}
\Delta p_{ij,t} &= \lambda_{ij} + \delta_t + \sum_{k=0}^{2} \beta_k \Delta e_{ij,t-k} + \sum_{k=0}^{2} \beta_k^{\$} \Delta e_{\$j,t-k} \\
&\quad + \sum_{k=0}^{2} \eta_k \Delta e_{ij,t-k} \times S_{j,t-1}^{Fin} + \sum_{k=0}^{2} \eta_k^{\$} \Delta e_{\$j,t-k}^{IV} \times S_{j,t-1}^{Fin} + \theta' X_{j,t} + \varepsilon_{ij,t}, \qquad (4)
\end{aligned}
$$

Comparing results in columns (7) and (8) of Table 11 to those in Table 2, the dynamic specification from Gopinath et al. (2020) delivers quantitatively similar results for both price and quantity regressions.

5 Conclusion

This paper provides evidence on the effect of the U.S. dollar on international trade prices and quantities through the financial channel of the exchange rate. It adds to earlier work by Bruno and Shin (2023) and Casas et al. (2022), providing evidence for the financial channel across many countries and at a global scale and over a longer sample that includes the pre-GFC period. The longer sample reveals that the financial channel was already active before the Global Financial Crisis and has strengthened since. The analysis presented here addresses endogeneity concerns of the dollar through a new instrumental variable approach based on U.S. housing market activity. Importantly, it finds that the instrumental variable approach is key to uncovering the full effect of the financial channel.

As most trade is financed by the exporter through the provision of trade credit, the financial channel operates mostly through conditions in the source country. This contrasts with the invoicing channel in Gopinath et al. (2020), which passes through shocks to the dollar exchange rate of the destination country to import prices. As we show, results on the financing channel of the exchange rate are unchanged when fully controlling for effects from the DCP by either including importer-year fixed effects or the dollar invoicing share of imports and its interaction with the dollar.

References

Aguiar, Mark, "Investment, devaluation, and foreign currency exposure: The case of Mexico," *Journal of Development Economics*, 2005, *78* (1), 95–113.

Ahn, JaeBin, "Understanding trade finance: theory and evidence from transaction-level data," Technical Report, International Monetary Fund, Washington, DC 2014.

_ and Miguel Sarmiento, "Estimating the direct impact of bank liquidity shocks on the real economy: Evidence from letter-of-credit import transactions in Colombia," *Review of International Economics*, 2019, *27* (5), 1510–1536.

Alfaro, Laura, Mauricio Calani, and Liliana Varela, "Currency hedging: Managing cash flow exposure," Discussion Paper DP16232 2021.

Amiti, Mary and David E. Weinstein, "Exports and Financial Shocks," *The Quarterly Journal of Economics*, 2011, *126* (4), 1841–1877.

_ , Oleg Itskhoki, and Jozef Konings, "Importers, exporters, and exchange rate disconnect," *American Economic Review*, 2014, *104* (7), 1942–78.

_ , _ , and _ , "International shocks and domestic prices: how large are strategic complementarities?," Technical Report, National Bureau of Economic Research 2016.

_ , _ , and _ , "Dominant currencies: How firms choose currency invoicing and why it matters," NBER Working Paper 27926, National Bureau of Economic Research 2020.

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

Auer, Raphael A and Raphael S Schoenle, "Market structure and exchange rate pass-through," *Journal of International Economics*, 2016, *98*, 60–77.

Avdjiev, Stefan, Wenxin Du, Catherine Koch, and Hyun Song Shin, "The dollar, bank leverage, and deviations from covered interest parity," *American Economic Review: Insights*, 2019, *1* (2), 193–208.

Bénétrix, Agustín, Deepali Gautam, Luciana Juvenal, and Martin Schmitz, *Cross-border currency exposures*, International Monetary Fund, 2019.

Berman, Nicolas, Philippe Martin, and Thierry Mayer, "How do different exporters react to exchange rate changes?," *The Quarterly Journal of Economics*, 2012, *127* (1), 437–492.

Bernanke, Ben S, "The global saving glut and the US current account deficit," *Remarks at the Sandridge Lecture, Virginia Assoc. Econ., Richmond, March 10.*, 2005.

Betts, Caroline M and Timothy J Kehoe, "Real exchange rate movements and the relative price of non-traded goods," Technical Report, National Bureau of Economic Research 2008.

Boz, Emine, Camila Casas, Georgios Georgiadis, Gita Gopinath, Helena Le Mezo, Arnaud Mehl, and Tra Nguyen, "Patterns in Invoicing Currency in Global Trade," Technical Report, IMF Working Paper 2020.

Bruno, Valentina and Hyun Song Shin, "Cross-border banking and global liquidity," *The Review of Economic Studies*, 2015, *82* (2), 535–564.

_ **and** _ , "Currency depreciation and emerging market corporate distress," *Management Science*, 2020, *66* (5), 1935–1961.

_ **and** _ , "Dollar and exports," *The Review of Financial Studies*, 2023, *36* (8), 2963–2996.

Canova, Fabio, "The transmission of US shocks to Latin America," *Journal of Applied econometrics*, 2005, *20* (2), 229–251.

Canzoneri, Matthew, Robert Cumby, Behzad Diba, and David López-Salido, "Key currency status: An exorbitant privilege and an extraordinary risk," *Journal of International Money and Finance*, 2013, *37*, 371–393.

Casas, Camila, Sergii Meleshchuk, and Yannick Timmer, "The dominant currency financing channel of external adjustment," International Finance Discussion Paper 1343 2022.

Chaney, Thomas, "Liquidity constrained exporters," *Journal of Economic Dynamics and Control*, 2016, *72*, 141–154.

Cook, David and Michael B Devereux, "External currency pricing and the East Asian crisis," *Journal of International Economics*, 2006, *69* (1), 37–63.

Corsetti, Giancarlo and Paolo Pesenti, "The simple geometry of transmission and stabilization in closed and open economies," Technical Report, National Bureau of Economic Research 2005.

_ **, Keith Kuester, Gernot Müller, and Sebastian Schmidt**, "The Exchange Rate Insulation Puzzle," Technical Report 2020.

Cuba-Borda, Pablo, Alexander Mechanick, and Andrea Raffo, "Monitoring the World Economy: A Global Conditions Index," IFDP Note 2018-06, Federal Reserve Board 2018.

Dahlquist, Magnus and Julien Pénasse, "The missing risk premium in exchange rates," *Journal of Financial Economics*, 2022, *143* (2), 697–715.

Demir, Banu and Beata Javorcik, "Don't throw in the towel, throw in trade credit!," *Journal of International Economics*, 2018, *111*, 177–189.

Devereux, Michael B, Kang Shi, and Juanyi Xu, "Global monetary policy under a dollar standard," *Journal of International Economics*, 2007, *71* (1), 113–132.

— , **Wei Dong, and Ben Tomlin**, "Importers and exporters in exchange rate pass-through and currency invoicing," *Journal of International Economics*, 2017, *105*, 187–204.

Du, Wenxin and Jesse Schreger, "Sovereign Risk, Currency Risk, and Corporate Balance Sheets," *The Review of Financial Studies*, 01 2022, *35* (10), 4587–4629.

Feenstra, Robert C, Joseph E Gagnon, and Michael M Knetter, "Market share and exchange rate pass-through in world automobile trade," *Journal of International Economics*, 1996, *40* (1-2), 187–207.

Forbes, Kristin, Ida Hjortsoe, and Tsvetelina Nenova, "The shocks matter: improving our estimates of exchange rate pass-through," *Journal of international economics*, 2018, *114*, 255–275.

Fratzscher, Marcel, Marco Lo Duca, and Roland Straub, "On the international spillovers of US quantitative easing," *The Economic Journal*, 2018, *128* (608), 330–377.

Garcia-Marin, Alvaro, Santiago Justel, and Tim Schmidt-Eisenlohr, "Trade credit, markups, and relationships," Working Paper, CESifo 2019.

— , — , **and** — , "Diversion Risk, Markups and the Financing Cost Advantage of Trade Credit," 2020. Mimeo.

Garetto, Stefania, "Firms' heterogeneity, incomplete information, and pass-through," *Journal of International Economics*, 2016, *101*, 168–179.

Gaulier, Guillaume and Soledad Zignago, "BACI: International Trade Database at the Product-Level. The 1994-2007 Version," Working Papers 2010-23, CEPII October 2010.

Georgiadis, Georgios, "Determinants of global spillovers from US monetary policy," *Journal of international Money and Finance*, 2016, *67*, 41–61.

Ghironi, Fabio, Jaewoo Lee, and Alessandro Rebucci, "The valuation channel of external adjustment," 2007.

Gilchrist, Simon and Egon Zakrajšek, "Credit spreads and business cycle fluctuations," *American economic review*, 2012, *102* (4), 1692–1720.

Giovanni, Julian Di, Şebnem Kalemli-Özcan, Mehmet Fatih Ulu, and Yusuf Soner Baskaya, "International spillovers and local credit cycles," *The Review of Economic Studies*, 2022, *89* (2), 733–773.

Goldberg, Linda and Cedric Tille, "Macroeconomic interdependence and the international role of the dollar," *Journal of Monetary Economics*, 2009, *56* (7), 990–1003.

Goldberg, Linda S and Cédric Tille, "Vehicle currency use in international trade," *Journal of international Economics*, 2008, *76* (2), 177–192.

— **and Cedric Tille**, "Micro, macro, and strategic forces in international trade invoicing: Synthesis and novel patterns," *Journal of International Economics*, 2016, *102*, 173–187.

Gopinath, Gita, "The international price system," Technical Report, National Bureau of Economic Research 2015.

— **and Oleg Itskhoki**, "Frequency of price adjustment and pass-through," *The Quarterly Journal of Economics*, 2010, *125* (2), 675–727.

— **, Emine Boz, Camila Casas, Federico J Díez, Pierre-Olivier Gourinchas, and Mikkel Plagborg-Møller**, "Dominant Currency Paradigm," *American Economic Review*, 2020.

Hardy, Bryan, "Foreign currency borrowing, balance sheet shocks and real outcomes," Working Paper 758, BIS 2018.

He, Zhiguo, Bryan Kelly, and Asaf Manela, "Intermediary asset pricing: New evidence from many asset classes," *Journal of Financial Economics*, 2017, *126* (1), 1–35.

Hoefele, Andreas, Tim Schmidt-Eisenlohr, and Zhihong Yu, "Payment Choice in International Trade: Theory and Evidence from Cross-country Firm Level Data," *Canadian Journal of Economics*, 2016, *49* (1), 296–319.

Jurado, Kyle, Sydney C Ludvigson, and Serena Ng, "Measuring uncertainty," *American Economic Review*, 2015, *105* (3), 1177–1216.

Kalemli-Özcan, Sebnem, "US monetary policy and international risk spillovers," Working Paper 26297, National Bureau of Economic Research 2019.

Kalemli-Ozcan, Sebnem, Herman Kamil, and Carolina Villegas-Sanchez, "What hinders investment in the aftermath of financial crises: Insolvent firms or illiquid banks?," *Review of Economics and Statistics*, 2016, *98* (4), 756–769.

Kim, Soyoung, "International transmission of US monetary policy shocks: Evidence from VAR's," *Journal of monetary Economics*, 2001, *48* (2), 339–372.

Kim, Yun Jung, Linda L. Tesar, and Jing Zhang, "The impact of foreign liabilities on small firms: Firm-level evidence from the Korean crisis," *Journal of International Economics*, 2015, *97* (2), 209 – 230.

Kletzer, Kenneth and Pranab Bardhan, "Credit Markets and Patterns of International Trade," *Journal of Development Economics*, October 1987, *27* (1-2), 57–70.

Lilley, Andrew, Matteo Maggiori, Brent Neiman, and Jesse Schreger, "Exchange rate reconnect," Technical Report, National Bureau of Economic Research 2019.

— **, — , — , and —** , "Exchange rate reconnect," *Review of Economics and Statistics*, 2022, *104* (4), 845–855.

Ma, Sai and Shaojun Zhang, "Housing Cycles and Exchange Rates," *Management Science,* forthcoming, 2023.

_ , Tim Schmidt-Eisenlohr, and Shaojun Zhang, "The Causal Effect of the Dollar on Trade," *Available at SSRN 3741800*, 2020.

Maćkowiak, Bartosz, "External shocks, US monetary policy and macroeconomic fluctuations in emerging markets," *Journal of monetary economics*, 2007, *54* (8), 2512–2520.

Manova, Kalina, "Credit constraints, heterogeneous firms, and international trade," *The Review of Economic Studies*, 2013, *80* (2), 711–744.

Miranda-Agrippino, Silvia and Hélene Rey, "US monetary policy and the global financial cycle," *The Review of Economic Studies*, 2020, *87* (6), 2754–2776.

Mundell, Robert A, *International Economics*, Macmillan, 1968.

Niepmann, Friederike and Tim Schmidt-Eisenlohr, "International trade, risk and the role of banks," *Journal of International Economics*, 2017, *107*, 111–126.

_ and _ , "No guarantees, no trade: How banks affect export patterns," *Journal of International Economics*, 2017, *108*, 338–350.

_ and _ , "Foreign currency loans and credit risk: Evidence from US banks," *Journal of International Economics*, 2022, *135*, 103558.

_ and _ , "Institutional investors, the dollar, and U.S. credit conditions," *Journal of Financial Economics*, 2023.

Obstfeld, Maurice and Haonan Zhou, "The global dollar cycle," Technical Report, National Bureau of Economic Research 2023.

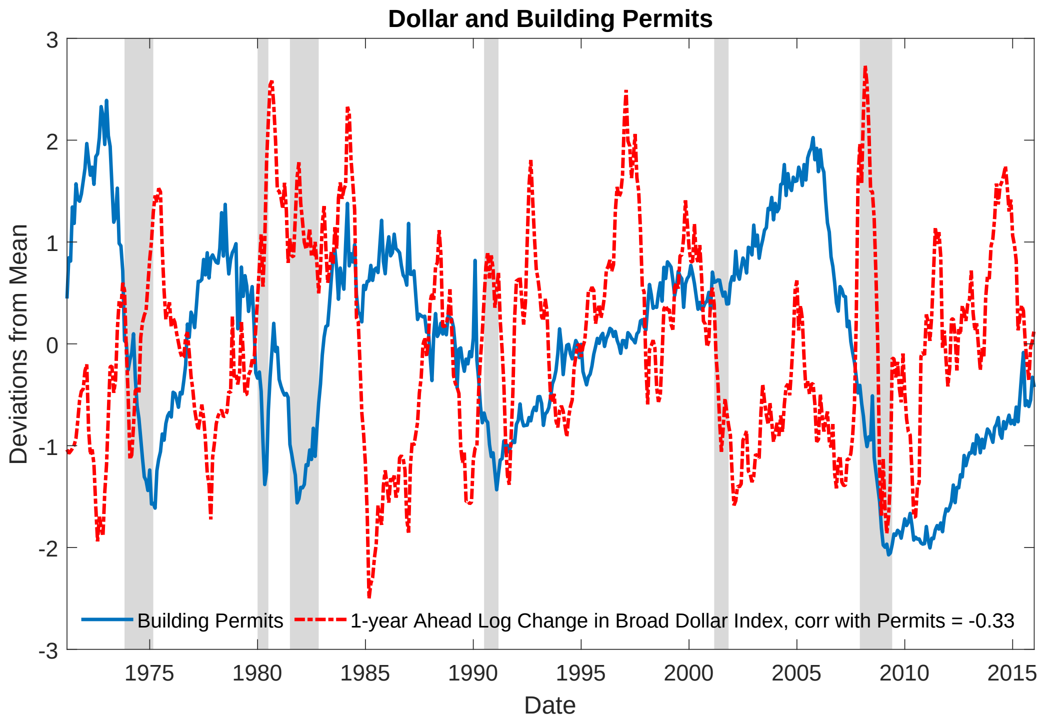
Paravisini, Daniel, Veronica Rappoport, Philipp Schnabl, and Daniel Wolfenzon, "Dissecting the effect of credit supply on trade: Evidence from matched credit-export data," *The Review of Economic Studies*, 2015, *82* (1), 333–359.

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

Tille, Cédric, "Financial integration and the wealth effect of exchange rate fluctuations," *Journal of International Economics*, 2008, *75* (2), 283–294.

Verdelhan, Adrien, "The share of systematic variation in bilateral exchange rates," *The Journal of Finance*, 2018, *73* (1), 375–418.

Figure 2. US Housing Investment and the Dollar



The figure plots the time-series of the standardized US building permit authorized and one-year ahead log change in average dollar index. The average dollar Index is computed as an equal-weighted average value of the U.S. dollars against a broad group of currencies which consists of 19 advanced economies and 13 emerging markets. Shaded areas correspond to NBER recession dates. The sample spans the period 1971 to 2016.

Table 1. U.S. Housing Activity Predicts the Dollar

Panel A: Time-series Evidence

Forecasting regression: $e_{\$j,t} = \alpha_j + \beta^H H_{t-1} + \epsilon_{j,t}$

	(1)	(2)	(3)	(3)	(4)	(5)
Housing Measure	Permits	Permits	Permits	Permits	PRFI/GDPI	Housing Starts
β^H	-2.98^{**}	-4.07^{***}	-3.87^{***}	-3.61^{**}	-1.81^{***}	-1.30^{**}
	(-2.21)	(-3.00)	(-2.93)	(-2.49)	(-2.33)	(-1.96)
F-stats p-value	0.027	0.003	0.003	0.003	0.026	0.036
Controls	None	Financial Cond.	Monetary Policy	All	None	None

Panel B: Additional Controls with Permits

Controls	Excess Bond	Term Spread	Credit/GDP	Broker-dealer	Real Dollar	All
β^H	-2.89^{***}	-3.08^{***}	-3.00^{***}	-2.67^{**}	-3.02^{***}	-3.28^{**}
	(-2.92)	(-3.73)	(-3.13)	(-2.76)	(-3.23)	(-2.77)
Control	-1.93^{**}	-2.36^{**}	-1.39	0.19	-1.96^{*}	
	(-2.37)	(-3.04)	(-1.40)	(0.44)	(-1.94)	

This table reports the coefficient, Newey-West t-statistic (in parenthesis), and the p-value from F-statistic from regressions that explain the dollar with different measures of housing activity. PRFI/GDPI is the ratio of private residential fixed investment to the gross investment. Column (2) and (3) of Panel A control for monetary policy variables and financial conditions. Panel B reports results with additional controls using U.S. building permits, see section 4.3 for more details. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 2. Baseline Estimates: the Financial Channel of the Exchange Rate

Panel A: Exchange Rate Pass-through into Prices							
	Specification #1			Specification #2			
	OLS	First Stage	Second Stage	OLS	First Stage	Second Stage	Second Stage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Instrumented var.		Dollar			Dollar x Share		
$\Delta e_{\$j,t}$	0.726***		0.541***	0.643***			
	(0.0156)		(0.0327)	(0.0232)			
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$				0.161***		0.676***	0.683***
				(0.0390)		(0.222)	(0.183)
H_t		-3.726***					
		(0.0550)					
$H_t \times S^{Fin}_{j,i-1}$					-3.716***		
					(0.1130)		
$\Delta e_{ij,t}$	0.942***	0.670***	0.914***	0.926***	0.0358	0.810***	0.461***
	(0.00703)	(0.0160)	(0.0123)	(0.0153)	(0.0266)	(0.0349)	(0.060)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$				0.0340	0.7359	0.0990	0.209***
				(0.0295)	(0.0463)	(0.123)	(0.075)
First-stage F-stats		99.54			40.23		
Time FE	Yes	No	No	Yes	Yes	Yes	No
Time x Importer FE	No	No	No	No	No	No	Yes
Observations	40,211	40,211	40,211	40,093	40,093	40,092	40,092
Number of dyad	2,411	2,411	2,411	2,411	2,411	2,411	2,411
Panel B: Trade Elasticity with respect to Exchange Rate							
	Specification #1			Specification #2			
	OLS	First Stage	Second Stage	OLS	First Stage	Second Stage	Second Stage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Instrumented var.		Dollar			Dollar x Share		
$\Delta e_{\$j,t}$	-0.111***		-1.103***	-0.0168			
	(0.0261)		(0.155)	(0.0502)			
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$				-0.130		-1.096**	-0.963**
				(0.0869)		(0.539)	(0.409)
H_t		-1.642***					
		(0.0535)					
$H_t \times S^{Fin}_{j,i-1}$					-2.078***		
					(0.629)		
$\Delta e_{ij,t}$	-0.170***	0.481***	-0.625***	-0.183***	-0.164***	0.0181	-0.485***
	(0.0223)	(0.0219)	(0.0878)	(0.0394)	(0.0324)	(0.123)	(0.167)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$				0.0234	0.877***	-0.865*	-0.329*
				(0.0834)	(0.1038)	(0.517)	(-0.180)
First Stage F-stats		12.23			10.87		
Time FE	Yes	No	No	Yes	Yes	Yes	No
Time x Importer FE	No	No	No	No	No	No	Yes
Observations	42,795	42,795	42,795	42,669	42,669	42,668	42,668
Number of dyad	2,807	2,807	2,807	2,558	2,558	2,558	2,558

For Panel A, all regressions include lags 0-2 of exporter log changes in PPI, and time fixed-effects (except for column 3). For Panel B, all regressions include lags 0-2 of importer real GDP growth, and time fixed-effects. The standard errors for OLS are clustered by dyads and associated standard errors are reported in parenthesis. Column (3) reports the 2SLS estimates using one-year lag of U.S. building permits as the instrument for the changes in US dollar. Column (6) reports the 2SLS estimates using one-year lag of U.S. building permits $\times$ Dollar-invoicing shares S_j as the instrument for the changes in US dollar $\times$ Dollar-invoicing Shares. The first-stage F-stats are clustered at the importer-year level. Column (7) includes year times importer fixed-effects. For column (6) and (7), the dollar term $\Delta e_{\$j,t}$ is absorbed by the time-fixed effects, because the instrument for the dollar, U.S. housing permits, only varies at the time level. The standard errors are reported in parenthesis. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 3. Baseline Estimates: Net Liability

	Price Regressions						Quantity Regressions					
	OLS	IV	IV	OLS	IV	IV	OLS	IV	IV	OLS	IV	IV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$\Delta e_{\$j,t}$	0.723***			0.721***			-0.102***			-0.0951***		
	(0.0156)			(0.0158)			(0.0286)			(0.0286)		
$\Delta e_{\$j,t} \times \left(L^{USD}_{j,t-1} - A^{USD}_{j,t-1}\right)/GDP_{j,t-1}$	0.0864**	0.662*	0.539**	0.0920**	0.700*	0.505**	-0.0697	-1.168**	-1.642***	-0.0271	-1.187**	-1.640***
	(0.0404)	(0.390)	(0.252)	(0.0431)	(0.397)	(0.259)	(0.0787)	(0.571)	(0.603)	(0.0843)	(0.577)	(0.610)
$\Delta e_{\$j,t} \times \left(L^{OTH}_{j,t-1} - A^{OTH}_{j,t-1}\right)/GDP_{j,t-1}$				-0.0106	0.0784	-0.0153				-0.194***	-0.376**	-0.393**
				(0.0425)	(0.135)	(0.130)				(0.0621)	(0.161)	(0.156)
$\Delta e_{ij,t}$	0.942***	0.780***	0.188***	0.936***	0.773***	0.186***	-0.170***	-0.0523	0.117*	-0.165***	-0.0505	0.106
	(0.00706)	(0.0146)	(0.0230)	(0.00795)	(0.0150)	(0.0244)	(0.0227)	(0.0357)	(0.0683)	(0.0230)	(0.0373)	(0.0699)
$\Delta e_{ij,t} \times \left(L^{USD}_{j,t-1} - A^{USD}_{j,t-1}\right)/GDP_{j,t-1}$	0.00741	0.00732	-0.0519	-0.001	-0.001	-0.054	0.00512	0.179**	0.141**	0.0110	0.186**	0.154**
	(0.0155)	(0.0416)	(0.0381)	(0.0161)	(0.0426)	(0.0390)	(0.0463)	(0.0762)	(0.0643)	(0.0475)	(0.0780)	(0.0653)
$\Delta e_{ij,t} \times \left(L^{OTH}_{j,t-1} - A^{OTH}_{j,t-1}\right)/GDP_{j,t-1}$				0.0855**	0.140**	0.0583				-0.0555	-0.161**	-0.174**
				(0.0392)	(0.0653)	(0.0521)				(0.0583)	(0.0745)	(0.0721)
Time FE	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No
Time $\times$ Importer FE	No	No	Yes	No	No	Yes	No	No	Yes	No	No	Yes
Observations	40,211	40,211	40,210	40,211	40,211	40,210	42,795	42,795	42,794	42,795	42,795	42,794

For price regressions, all regressions include lags 0-2 of exporter log changes in PPI, and time fixed-effects. For quantity regressions, all regressions include lags 0-2 of importer real GDP growth, and time fixed-effects unless otherwise noted. The standard errors for OLS are clustered by dyads and associated standard errors are reported in parenthesis. The standard errors are reported in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 4. Baseline IV Estimates: Product-level Evidence

Panel A: Exchange Rate Pass-through into Prices				
	OLS	OLS	IV	IV
	(1)	(2)	(3)	(4)
$\Delta e_{\$j,t}$	0.614***	0.323***	0.330***	
	(0.0263)	(0.0408)	(0.0060)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		0.782***		0.504***
		(0.0700)		(0.0525)
$\Delta e_{ij,t}$	0.944***	0.923***	0.861***	0.910***
	(0.0131)	(0.0152)	(0.0031)	(0.00534)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		0.0777		-0.236***
		(0.0480)		(0.0280)
Year FE	Yes	Yes	No	Yes
HS6 FE	Yes	Yes	No	Yes
Observations	29,738,165	29,738,165	29,738,165	29,738,165
Panel B: Trade Elasticity with respect to Exchange Rate				
	OLS	OLS	IV	IV
	(1)	(2)	(3)	(4)
$\Delta e_{\$j,t}$	-0.281***	-0.0712	-1.174***	
	(0.0301)	(0.0449)	(0.0144)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		-0.657***		-1.405***
		(0.203)		(0.0973)
$\Delta e_{ij,t}$	-0.455***	-0.345***	-0.759***	-0.280***
	(0.0201)	(0.0293)	(0.0063)	(0.0104)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		-0.331***		-0.737***
		(0.0712)		(0.0613)
Year FE	Yes	Yes	No	Yes
HS6 FE	Yes	Yes	No	Yes
Observations	32,572,367	32,572,367	32,572,367	32,572,367

For Panel A, all regressions include lags 0-2 of exporter log changes in PPI, and fixed-effects specified in the table. For Panel B, all regressions include lags 0-2 of importer real GDP growth, and fixed-effects specified in the table. The standard errors for OLS are clustered by dyads and associated standard errors are reported in parenthesis. The standard errors are reported in parenthesis. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 5. Non-housing Products

Panel A: Exchange Rate Pass-through into Prices				
	OLS	OLS	IV	IV
	(1)	(2)	(3)	(4)
$\Delta e_{\$j,t}$	0.705***	0.519***	0.479***	
	(0.0529)	(0.0768)	(0.0214)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		0.507***		0.721***
		(0.0967)		(0.148)
$\Delta e_{ij,t}$	0.949***	0.901***	0.859***	0.868***
	(0.0284)	(0.0380)	(0.0120)	(0.0178)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		0.142		0.696***
		(0.0904)		(0.0775)
Year FE	Yes	Yes	No	Yes
HS6 FE	Yes	Yes	No	Yes
Observations	2,175,699	2,175,699	2,175,699	2,175,699
Panel B: Trade Elasticity with respect to Exchange Rate				
	OLS	OLS	IV	IV
	(1)	(2)	(3)	(4)
$\Delta e_{\$j,t}$	-0.511***	-0.459***	-0.596***	
	(0.0577)	(0.0849)	(0.0539)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		-0.274**		-3.932***
		(0.132)		(0.299)
$\Delta e_{ij,t}$	-0.595***	-0.433***	-0.603***	-0.586***
	(0.0372)	(0.0520)	(0.0254)	(0.0317)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		-0.435***		-2.319***
		(0.122)		(0.185)
Year FE	Yes	Yes	No	Yes
HS6 FE	Yes	Yes	No	Yes
Observations	2,344,681	2,344,681	2,344,681	2,344,681

For Panel A, all regressions include lags 0-2 of exporter log changes in PPI, and fixed-effects specified in the table. For Panel B, all regressions include lags 0-2 of importer real GDP growth, and fixed-effects specified in the table. The standard errors for OLS are clustered by dyads. The associated standard errors are reported in parenthesis. The standard errors are reported in parenthesis. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 6. IV Robustness: Control for Trade Share with the US

	Price Regressions		Quantity Regressions	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
$\Delta e_{\$j,t}$	0.634***		-0.0897	
	(0.0496)		(0.0993)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,t-1}$	0.143***	0.761***	-0.153	-1.367**
	(0.0405)	(0.233)	(0.0931)	(0.560)
$\Delta e_{\$j,t} \times S^{\text{Trade}}_{j,t-1}$	0.233	6.051***	0.890	2.974
	(0.518)	(1.689)	(1.045)	(3.213)
$\Delta e_{ij,t}$	0.950***	0.780***	-0.127*	0.0631
	(0.0264)	(0.0438)	(0.0719)	(0.177)
$\Delta e_{ij,t} \times S^{Fin}_{j,t-1}$	0.0220	0.321**	0.0292	-0.883
	(0.0321)	(0.128)	(0.0908)	(0.578)
$\Delta e_{ij,t} \times S^{\text{Trade}}_{j,t-1}$	-0.220	0.767	-0.711	0.0254
	(0.309)	(0.543)	(0.830)	(1.456)
Time FE	Yes	Yes	Yes	Yes
Observations	39,025	39,025	41,622	41,622
Number of dyad	2,362	2,362	2,509	2,509

For price regressions, all regressions include lags 0-2 of exporter log changes in PPI, and time fixed-effects. For quantity regressions, all regressions include lags 0-2 of importer real GDP growth, and time fixed-effects. The standard errors for OLS are clustered by dyads and associated standard errors are reported in parenthesis. In all results, the trade with U.S. is the share of the sum of imports and exports of goods and services to or from the U.S. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 7. IV Robustness: Control for Monetary Policy and Financial & Risk Factors

Panel A: Exchange Rate Pass-through into Prices						
Controls	Financial & Risk Factors		Monetary Policy		All	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta e_{\$j,t}$	0.334***		0.427***		0.295***	
	(0.0184)		(0.0280)		(0.0205)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,t-1}$		0.455**		0.441**		0.667***
		(0.225)		(0.189)		(0.207)
$\Delta e_{ij,t}$	0.865***	0.835***	0.877***	0.837***	0.847***	0.814***
	(0.0105)	(0.0370)	(0.0116)	(0.0329)	(0.0112)	(0.0341)
$\Delta e_{ij,t} \times S^{Fin}_{j,t-1}$		-0.0159		-0.0227		0.0884
		(0.129)		(0.110)		(0.117)
First-stage F-stats	138.60	62.17	92.15	55.89	171.24	52.17
Observations	40,211	40,093	40,211	40,093	40,211	40,093
Number of dyad	1,900	1,900	1,900	1,900	1,900	1,900
Panel B: Trade Elasticity with respect to Exchange Rate						
Controls	Financial & Risk Factors		Monetary Policy		All	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta e_{\$j,t}$	-0.0494		0.161**		-0.0468	
	(0.0394)		(0.0687)		(0.0439)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,t-1}$		-1.236***		-0.560**		-0.930***
		(0.415)		(0.277)		(0.314)
$\Delta e_{ij,t}$	-0.140***	0.0479	-0.0407	-0.0928	-0.139***	-0.0146
	(0.0242)	(0.105)	(0.0358)	(0.0716)	(0.0256)	(0.0822)
$\Delta e_{ij,t} \times S^{Fin}_{j,t-1}$		-0.992**		-0.363		-0.708**
		(0.416)		(0.276)		(0.316)
First-stage F-stats	181.55	62.77	89.11	65.77	151.88	42.17
Observations	42,795	42,669	42,795	42,669	42,795	42,669
Number of dyad	2,014	2,014	2,014	2,014	2,014	2,014

Financial and risk factors include the VXO, the corporate bond spread (Baa-AAA), the effective broad Japanese Yen exchange rate, the global dollar factor, the world recession probability, the HKM intermediary capital ratio factor, and the JLN macro uncertainty. Monetary controls include the 2-year T-bill rate, the term spread (10yr minus 2yr rate), and the SPF one-year forecast of the 3m T-bill rate. For all regressions, the interaction terms between all controls and the dollar invoicing share are included. All import price regressions in Panel A include lags 0-2 of exporter log changes in PPI. All import quantity regressions in Panel B include lags 0-2 of importer real GDP growth. Column (2), (4), and (6) also include time fixed-effects. The first-stage F-stats are clustered at the importer-year level. For column (2), (4) and (6), the dollar term $\Delta e_{\$j,t}$ is absorbed by the time-fixed effects, because the instrument for the dollar, U.S. housing permits, only varies at the time level. The standard errors are reported in parenthesis. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 8. IV Robustness: Different Sub-Periods

Panel A: Exchange Rate Pass-through into Prices						
Sub-periods	Exclude GFC		Pre–GFC		Post-GFC	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta e_{\$j,t}$	0.402***		0.312***		0.789***	
	(0.0270)		(0.0310)		(0.213)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		0.758***		0.425**		1.395***
		(0.173)		(0.186)		(0.387)
$\Delta e_{ij,t}$	0.883***	0.834***	0.900***	0.865***	0.915***	0.867***
	(0.0121)	(0.0304)	(0.0114)	(0.0344)	(0.0764)	(0.152)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		0.0856		0.00609		1.212
		(0.0899)		(0.108)		(0.885)
First-stage F-stats	182.22	88.24	351.24	49.29	71.29	50.99
Observations	28,284	28,166	18,343	18,343	9,901	9,783
Number of dyad	2,411	2,411	2,284	2,284	2,354	2,354
Panel B: Trade Elasticity with respect to Exchange Rate						
Sub-periods	Exclude GFC		Pre–GFC		Post-GFC	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta e_{\$j,t}$	-0.453***		-0.417***		-0.401***	
	(0.0773)		(0.0526)		(0.0588)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		-1.376***		-0.488**		-3.809*
		(0.303)		(0.178)		(2.278)
$\Delta e_{ij,t}$	-0.328***	0.118	-0.077**	-0.112	-0.182	-0.585*
	(0.0456)	(0.0902)	(0.030)	(0.0805)	(0.265)	(0.342)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		-1.188***		-0.294		-1.327
		(0.325)		(0.289)		(2.067)
First-stage F-stats	19.25	29.04	129.25	79.02	22.77	21.19
Observations	30,313	30,187	20,044	20,044	10,226	10,100
Number of dyad	2,558	2,558	2,510	2,510	2,550	2,550

For price regressions, all regressions include lags 0-2 of exporter log changes in PPI, and time fixed-effects. For quantity regressions, all regressions lags 0-2 of importer real GDP growth, and time fixed-effects. The standard errors for OLS are clustered by dyads and associated standard errors are reported in parenthesis. The standard errors are reported in parenthesis. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 9. IV Robustness: Alternative Housing Instruments

Panel A: Exchange Rate Pass-through into Prices						
Instruments:	1-3 lags of permits		US PRFI/GDPI		Housing Starts	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta e_{\$j,t}$	0.577***		0.344***		0.544***	
	(0.0402)		(0.0212)		(0.0345)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		0.696***		0.379**		0.713***
		(0.262)		(0.172)		(0.247)
$\Delta e_{ij,t}$	0.924***	0.807***	0.857***	0.845***	0.914***	0.805***
	(0.0139)	(0.0387)	(0.0122)	(0.0305)	(0.0128)	(0.0372)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		0.109		-0.0580		0.118
		(0.144)		(0.100)		(0.136)
First-stage F-stats	116.82	41.24	138.24	51.41	116.22	45.17
Observations	40,211	40,093	40,211	40,093	40,211	40,093
Number of dyad	2,411	2,411	2,411	2,411	2,411	2,411
Panel B: Trade Elasticity with respect to Exchange Rate						
Instruments:	1-3 lags of Permits		US PRFI/GDPI		Housing Starts	
	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta e_{\$j,t}$	-1.405***		-0.550***		-1.616***	
	(0.220)		(0.0694)		(0.216)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		-1.161*		-0.828**		-1.349**
		(0.659)		(0.396)		(0.684)
$\Delta e_{ij,t}$	-0.766***	0.0317	-0.365***	-0.0379	-0.865***	0.0710
	(0.121)	(0.146)	(0.0406)	(0.0914)	(0.123)	(0.152)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		-0.926		-0.614		-1.102*
		(0.628)		(0.378)		(0.651)
First-stage F-stats	158.34	74.22	143.77	61.11	146.40	51.23
Observations	42,795	42,669	42,795	42,669	42,795	42,669
Number of dyad	2,558	2,558	2,558	2,558	2,558	2,558

All import price regressions in Panel A include lags 0-2 of exporter log changes in PPI. All import quantity regressions in Panel B include lags 0-2 of importer real GDP growth. Column (2), (4), and (6) also include time fixed-effects. PRFI/GDPI is the share of US gross domestic private investment (GDPI) attributable to the private residential fixed investment (PRFI). For column (2), (4) and (6), the dollar term $\Delta e_{\$j,t}$ is absorbed by the time-fixed effects, because the instrument for the dollar, U.S. housing permits, only varies at the time level. The standard errors are reported in parenthesis. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Table 10. IV Robustness: USD Invoicing Shares

	Price Regressions		Quantity Regressions	
	OLS	IV	OLS	IV
	(1)	(2)	(3)	(4)
$\Delta e_{\$j,t}$	0.656***		-0.0111	
	(0.0314)		(0.0598)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,t-1}$	-0.0612	0.501**	-0.0961	-1.068**
	(0.0396)	(0.226)	(0.0719)	(0.499)
$\Delta e_{\$j,t} \times S^{\text{Invoicing}}_{i,t-1}$	0.115***	0.105	-0.0389	0.580**
	(0.0330)	(0.183)	(0.0699)	(0.257)
$\Delta e_{ij,t}$	0.913***	0.657***	-0.276***	-0.424***
	(0.0234)	(0.0358)	(0.0576)	(0.0647)
$\Delta e_{ij,t} \times S^{Fin}_{j,t-1}$	0.0321	0.128	0.0437	-0.487
	(0.0247)	(0.123)	(0.0675)	(0.479)
$\Delta e_{ij,t} \times S^{\text{Invoicing}}_{i,t-1}$	0.0488*	0.234***	0.130*	0.603***
	(0.0291)	(0.0765)	(0.0725)	(0.183)
Time FE	Yes	Yes	Yes	Yes
Observations	38,324	38,324	40,855	40,855

For price regressions, all regressions include lags 0-2 of exporter log changes in PPI, and time fixed-effects. For quantity regressions, all regressions include lags 0-2 of importer real GDP growth, and time fixed-effects. The standard errors for OLS are clustered by dyads and associated standard errors are reported in parenthesis. The standard errors are reported in parenthesis. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Table 11. IV Robustness: Additional Checks

Panel A: Exchange Rate Pass-through into Prices								
	Commodity		Commodity + Noncom.		Broad Dollar Index		Dynamic Spec.	
	(1) IV	(2) IV	(3) IV	(4) IV	(5) OLS	(6) IV	(7) IV	(8) IV
$\Delta e_{\$j,t}$	-0.220***		0.298***				0.659***	
	(0.0324)		(0.0324)				(0.0359)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		0.879***		0.488**	-0.0413	1.734***		0.804***
		(0.238)		(0.226)	(0.0586)	(0.589)		(0.244)
$\Delta e_{ij,t}$	0.741***	0.767***	0.873***	0.803***	0.892***	0.873***	0.961***	0.783***
	(0.0195)	(0.0353)	(0.0133)	(0.0335)	(0.0245)	(0.0266)	(0.0132)	(0.0391)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		0.282**		0.0978	-0.259***	-0.238***		0.201
		(0.128)		(0.120)	(0.0536)	(0.0559)		(0.143)
Observations	39,840	39,839	40,348	40,347	40,093	40,093	41,601	41,601
Panel B: Trade Elasticity with respect to Exchange Rate								
Instruments:	Commodity		Commodity + Noncom.		Broad Dollar Index		Dynamic Spec.	
	(1) IV	(2) IV	(3) IV	(4) IV	(5) OLS	(6) IV	(7) IV	(8) IV
$\Delta e_{\$j,t}$	-0.296*		-0.808***				-1.193***	
	(0.173)		(0.143)				(0.160)	
$\Delta e_{\$j,t} \times S^{Fin}_{j,i-1}$		-3.284***		-1.483***	0.127	-2.207**		-1.677***
		(0.745)		(0.507)	(0.140)	(1.088)		(0.547)
$\Delta e_{ij,t}$	-0.275***	0.425**	-0.489***	0.0967	-0.212***	-0.198***	-0.704***	0.137
	(0.0856)	(0.189)	(0.0765)	(0.116)	(0.0316)	(0.0319)	(0.0870)	(0.127)
$\Delta e_{ij,t} \times S^{Fin}_{j,i-1}$		-2.849***		-1.223**	0.160***	0.163***		-1.453***
		(0.741)		(0.481)	(0.0483)	(0.0474)		(0.533)
Observations	42,599	42,473	43,171	43,045	42,669	42,669	44,419	44,419

For price regressions, all regressions include lags 0-2 of exporter log changes in PPI, and time fixed-effects. For quantity regressions, all regressions include lags 0-2 of importer real GDP growth, and time fixed-effects. “Dynamic spec.” also includes 1-2 lags of the independent variables. The standard errors for OLS are clustered by dyads and associated standard errors are reported in parenthesis. The standard errors are reported in parenthesis. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.