The Globalization Risk Premium[†]

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Abstract

We investigate how globalization is reflected in asset prices. We use shipping costs to measure firms' exposure to globalization. Firms in low shipping cost industries carry a 7 percent risk premium, suggesting that their cash-flows covary negatively with investors' marginal utility. We find that the premium emanates from the risk of displacement of least efficient firms triggered by import competition. These findings suggest that foreign productivity shocks are associated with times when consumption is dear for investors. We discuss conditions under which a standard model of trade with asset prices can rationalize this puzzle.

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1 Introduction

Recent decades have been characterized by a high degree of trade integration. This era of globalization[1] is generally seen in a positive light and associated with more product variety at lower prices, cheaper intermediate goods, and the access for U.S. firms to foreign markets.[2] Yet globalization also makes domestic economies more sensitive to foreign shocks. A salient example is China's productivity growth that led to a dramatic increase in its exports to the rest of the world and to the U.S. in particular, with both consumption gains, and negative consequences for manufacturing employment and wages.[3] In short, globalization exposes domestic economies to foreign shocks with heterogeneous effects on households and firms that complicate the analysis of its overall impact.

We study the effects of globalization through the lens of asset prices. Assets' exposure to macroeconomic shocks are reflected in risk premia. We capture firms' exposure to trade shocks and examine their effects on U.S. investors' marginal utility. Our approach relates to a recent line of work that uses information from asset markets to evaluate the effects of innovation and technological change (see for instance Gârleanu, Panageas and Yu (2012b)). The intuition is as follows: if the performance of firms exposed to international trade flows covaries negatively with investors' marginal utility, these firms will command a risk premium. This is what we find empirically. This premium can either be driven by a positive or a negative joint reaction of domestic firms' performance and households' consumption to foreign shocks. Our evidence points to the latter and indicates that states of the world where firms suffer from increased import competition are states where consumption is dear. In summary, foreign shocks are perceived as bad news by the marginal investor.

We use shipping costs (SC) to measure firms' exposure to globalization. More precisely, we follow Bernard, Jensen and Schott (2006b) and exploit import data to compute the various costs associated with shipments, called Cost-Insurance-Freight, as a percentage of the price paid by importers. We document substantial cross-sectional variation and time-series persistence in shipping costs, consistent with the idea that this proxy captures structural and slow-moving barriers to trade. We also show that shipping costs are tightly linked to the weight-to-value ratio of shipments, and find that both measures correlate negatively with firms' propensity to import and export, namely, with their exposure to globalization.

We then build portfolios of stocks based on quintiles of shipping costs and analyze

[1]While the focus of this paper is restricted to international trade flows, the term "globalization" sometimes also encompasses economic and financial integration.

[2]See, for instance Broda and Weinstein (2006); Feenstra and Weinstein (2010) for product variety at lower prices, Goldberg, Khandelwal, Pavcnik and Topalova (2010); De Loecker, Goldberg, Khandelwal and Pavcnik (2012) for cheaper intermediate goods, and Lileeva and Trefler (2010) for access to foreign markets.

[3]See Amiti, Dai, Feenstra and Romalis (2016) for consumption gains and Pierce and Schott (2012); Autor, Dorn and Hanson (2013); Acemoglu, Autor, Dorn, Hanson and Price (2014) for effects on employment and wages.

their returns from 1975 to 2015. We find that the zero cost portfolio that is long stocks in high shipping cost industries and short stocks in low shipping cost industries has average annual excess returns of −7 percent and a Sharpe ratio of 35 percent. To confirm that this premium does not reflect loadings on well-known risk factors, we estimate the residual of stock excess returns from the five factor model of Fama and French (2015). We find that the low shipping cost portfolio has abnormal returns of 9.7 percent annually, and that the high minus low shipping cost portfolio generates negative excess returns of 13.7 percent annually. These findings hold whether we focus on U.S. or European stocks, and across sub-periods in our sample. Importantly, they hold when portfolios are value weighted, which underscores that foreign shocks matter for investors' wealth. Finally, we do not find evidence that investors misunderstand the displacement effect of import competition in a way that could create a wedge between ex-post realized returns and ex-ante expected returns. In particular, we find no systematic differences in earnings announcement returns for stocks with low and high shipping costs; moreover, equity analysts tend to correctly predict the effect of import competition on domestic U.S. firms. We conclude that the risk of foreign shocks is priced in the cross-section of expected returns, and that the performance of firms exposed to these shocks covaries negatively with domestic investors' marginal utility.

There are two possible interpretations for this finding: a positive response of consumption and cash-flows to foreign shocks through higher exports or sourcing opportunities; or a negative response of consumption and cash-flows through the displacement of domestic firms by import competition. We find evidence for the latter. First, the risk premium is concentrated among firms that are likely to suffer from import competition, but unlikely to greatly benefit from increased export opportunities. Second, the returns of firms in low shipping cost industries load more negatively on a proxy for foreign productivity shocks, especially the returns of firms more likely to suffer from import competition. Taken together these results indicate that the price of the risk of foreign shocks is negative, i.e., that consumption responds negatively to foreign shocks. Given the domestic benefits associated with foreign shocks including gains from variety, lower prices, and enhanced export opportunities, this finding is a puzzle. It suggests that the displacement risk associated with foreign shocks outweighs their benefits from the perspective of domestic investors.

We ask how this puzzle can be rationalized within a standard two-country dynamic general equilibrium model à la Melitz (2003). We first derive the elasticity of domestic profits and the elasticity of export profits to foreign productivity shocks. The former is negative due to price effects, and amplified if demand elasticity is high. Export profits instead benefit from a rise in demand in the foreign country, although this effect is dampened by the intensity of competition in the foreign market. The response of domestic households' utility to foreign productivity shocks trades off two competing effects: a positive price effect where the price of the final consumption index decreases as import competition intensifies; an ambiguous wealth effect due to the change in the value of households' portfolios. The model predicts that if the price of risk is negative, the risk premium should be concentrated among small and less productive firms; and among these firms, in industries with strong business stealing effects. We check and find that all these predictions hold in the cross-section of expected returns.

We calibrate the model using standard parameter values and analyze impulse responses of cash-flows, valuations and consumption to positive foreign productivity shocks. If perfect risk-sharing is allowed across countries, households are diversified internationally, and consumption always increases following foreign productivity shocks. The risk premium of firms in low shipping cost industries is close to zero and the sign of the price of risk is positive, contrary to our empirical finding that it is negative. Hence, a standard model of trade with asset prices and perfect risk-sharing fails to rationalize the globalization risk premium.

We next explore how the model can be consistent with the negative price of risk we document empirically. If we allow risk-sharing to be limited, namely, if domestic households are not internationally diversified, the response of consumption to foreign productivity shocks can become negative. Households own domestic firms that are displaced by import competition, the value of their portfolio shrinks, and their consumption drops. In that case the model delivers a risk premium for firms in low shipping cost industries, and the sign of the price of risk is negative, consistent with our baseline empirical findings. Our limited risk-sharing assumption thus allows consumption to react negatively to foreign productivity shocks. Alternative assumptions may help rationalize the puzzle of the globalization risk premium within the Melitz model – we leave them to future research.

Going back to Eaton and Kortum (2002) the literature has investigated the domestic effects of foreign shocks through trade linkages. Recent studies have focused on the consequences of China's productivity growth and the resulting increase in exports to the U.S., with mixed results across methodologies (Hsieh and Ossa, 2011; Pierce and Schott, 2012; di Giovanni, Levchenko and Zhang, 2014; Autor, Dorn and Hanson, 2013; Acemoglu, Autor, Dorn, Hanson and Price, 2014; Autor, Dorn, Hanson and Song, 2014; Caliendo, Dvorkin, Parro et al., 2015; Amiti, Dai, Feenstra and Romalis, 2016). We approach this important question in a new way, through the lens of asset prices. By showing that firms exposed to international trade flows carry a risk premium, especially those with a higher risk of displacement, we can infer that the occurrence of positive shocks in the rest of the world are perceived as times when marginal utility is high for U.S. investors.

We build on the international trade literature, which starting with Melitz (2003) and Bernard, Jensen, Eaton and Kortum (2003), has taken firm heterogeneity into account to analyze the gains from trade. More specifically our model is closest to Chaney (2008) and Ghironi and Melitz (2005). In this framework, globalization generates both winners and losers within an industry, as better-performing firms expand into foreign markets, while worse-performing firms contract in the face of foreign competition.[4] The displacement of least efficient firms has been confirmed in a number

[4]For recent reviews, see Bernard, Jensen, Redding and Schott (2007), Melitz and Trefler (2012),

of empirical studies including Pavcnik (2002); Trefler (2004); Bernard and Jensen (2004); Bernard, Jensen and Schott (2006a,b). Relative to this line of work, our main contribution is to show that the risk of import competition is reflected in firms' cost of capital, which suggests that investors require compensation for exposure to these firms. By analyzing the asset pricing implications of the Melitz model and confronting them with the negative price of risk that we document empirically, we also hope to stimulate and discipline future theoretical work in this area.

We finally contribute to a better understanding of the implications of product market dynamics, including international trade, for asset pricing and the cost of capital. Early work by Grossman and Levinsohn (1989) emphasized the link between import competition and contemporaneous stock returns. We show that displacement risk is reflected in the cost of capital *ex-ante*, which suggests that the marginal utility of U.S. investors covaries positively with this risk factor.[5] We rationalize the globalization risk premium arguing there is imperfect risk-sharing between households across countries. While this particular mechanism is new, it fits in a more recent literature. For example Gârleanu, Kogan and Panageas (2012a) or Kogan, Papanikolaou and Stoffman (2016) use the lack of complete risk-sharing across generations of households to account for the negative risk premium of embodied technical change. More recent work by Hou and Robinson (2006), Tian (2011), Loualiche (2015), Ready, Roussanov and Ward (2013), and Bustamante and Donangelo (2015) show that the risk of entry is priced in the cross-section of expected returns.[6] We focus on the risk associated with import competition and find it to be priced as well. Our work finally relates to a stream of work that uses international macroeconomy models to study risk premia across countries and the link between currency dynamics and interest rates, including Lustig, Roussanov and Verdelhan (2011), Hassan (2013), Hassan, Mertens and Zhang (2016), or Richmond (2016).[7] Our model departs from the international business cycle literature as we allow for firm level heterogeneity, leading to novel predictions of the impact of international trade on the cross-section of firm-level stock returns.

The remainder of the paper is organized as follows. In Section 2, we present our measure of shipping costs and estimate the globalization risk premium. In Section 3, we lay out the theoretical framework and test additional empirical predictions. Section 4 concludes.

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or Melitz and Redding (2014).

[5]A related contribution is Fillat and Garetto (2015) who find that multinational corporations earn higher excess returns than non-multinationals.

[6]In addition, a series of papers have used tariff cuts to instrument for import competition and have found that it affects firms capital budgeting decisions Bloom, Draca and Van Reenen (2011); Fresard and Valta (2014), and capital structure Xu (2012); Valta (2012). Firms have also been found to suffer less from import competition if they have larger cash holdings Fresard (2010) and R&D expenses Hombert and Matray (2014).

[7]For an analysis of the effect of exchange rate exposure in the cross-section of expected returns, see Griffin and Stulz (2001) and Bodnar et al. (2002).

2 Measuring the globalization risk premium

2.1 Shipping costs

Industry-level data. We hypothesize that firms are less exposed to international trade flows if the shipping costs (SC) incurred to replace their products with imported ones are larger.[8] We measure these costs using the actual shipping cost paid by importers. We consider ad valorem freight rates from underlying product-level U.S. import data. We obtain these data at the 4-digit SIC codes level from Feenstra (1996) for 1974 to 1988, and from Peter Schott's website for 1989 to 2014. Freight costs – our proxy for shipping costs – is the markup of the Cost-Insurance-Freight value over the Free-on-Board value.

Building on prior work, we argue that SC are a structural characteristic rooted in the nature of output produced by any given industry.[9] According to Hummels (2007), SC depend on the weight-to-value ratio: the markup is larger for goods that are heavy relative to their value. From 1989 onwards, we therefore construct industry-year weight-to-value ratios (at the 4-digit SIC codes level), measured as the ratio of kilograms shipped to the value of the shipment, as an alternative measure of exposure to globalization.

We check that SC are widely dispersed across industries, that they are persistent and that they are indeed related to trade flows. We find substantial heterogeneity in SC across industries. Table 1 presents summary statistics for our industry-year sample that covers 439 unique manufacturing industries (with 4-digit SIC codes between 2000 and 3999). We find SC to be 5.6% of the price of shipments on average, with a 1^{st} percentile of 0.2% and a 99^{th} percentile of 22.4%.[10]

To check whether SC are indeed persistent, we sort sectors by quintiles of SC each year, and look at the transition across quintiles over time. We present this analysis in Table 2. The left side of Panel A highlights the transition from year $t-1$ to year t, while the right side shows the transition from year $t-5$ to year t. For sectors in the top or bottom quintiles of the distribution of SC, the probability of being in the same quintile in the next year (respectively five years later) is above 85% (respectively 73%). Persistence is even more pronounced when we consider weight-to-value ratios

[8] Hummels et al. (2014) also uses transportation costs as an instrument for the propensity of Danish firms to offshore tasks.

[9] The main limitation of SC is that it does not take into account unobserved shipping costs – for instance time to ship (Hummels et al., 2014) or information barriers and contract enforcement costs, holding costs for the goods in transit, inventory costs due to buffering the variability of delivery dates, or preparation costs associated with shipment size (Anderson and van Wincoop, 2004). Unless these costs are correlated in systematic ways with SC, they are likely to introduce noise in our measure of the sectoral exposure to displacement risk, which should generate an attenuation bias in our results. For recent contributions to the literature that adopts a structural approach to measure trade costs and estimate their effect on trade, see for instance Hummels and Skiba (2004), Das et al. (2007), or Irarrazabal et al. (2013).

[10] The distribution of SC across 2-digit industries is presented in Appendix Table B.1.

in Panel B, where the probability of being in the same quintile in the next year and five years later is over 90% for the top and bottom quintiles.

Industry-level regressions. We next confirm SC are a relevant proxy for the exposure to the displacement risk associated with globalization. To analyze the differential trade flows in high and low SC industries, we consider imports, exports and net imports normalized by total domestic shipments plus imports at the industry-year level. We measure imports and exports as well as tariffs using U.S. data obtained from Peter Schott's website, and shipments using the NBER-CES Manufacturing Industry Database, which also provides annual industry-level information on employment, value added and total factor productivity until 2011.

Table 3 presents industry-year OLS panel regressions of trade flows on our measures for SC as well as tariffs, the log of employment, log value added, log shipments, and total factor productivity. All specifications include year fixed effects. In Panel A, we find that SC are negatively associated with imports and exports. A one standard deviation increase in SC is associated with a 2.3 percentage points decrease in imports (Column 2) and a 2.7 percentage points decrease in exports (Column 5), which amounts to 12% and 23% of the standard deviation of imports and exports, respectively. When included with controls in the regression (Column 8), SC are uncorrelated with net imports (imports minus exports), which illustrates the dual dimension of exposure to globalization: the costs in terms of higher import penetration, and the benefits in terms of higher exports. When we introduce industry fixed effects and effectively consider within-industry changes in SC (Columns 3 and 6), the coefficient on SC remains negative but drops and becomes insignificantly different from zero. This is consistent with the finding in Table 2 that SC are persistent, and that within-industry variations in SC do not predict variations in trade flows.[11] A very similar picture emerges when we consider log weight-to-value ratios instead of SC (Panel B). Overall, the evidence confirms that shipping costs proxy for differences across industries in their exposure to international trade flows.

Identification. To more formally establish the link between SC and exposure to international trade, we need to show that high SC industries are less affected than low SC industries by exogenous foreign shocks. We exploit two shocks to trade barriers that have been used in the literature to instrument for import competition: China's entry in the World Trade Organization (WTO), and tariff changes. We first check whether SC predict Chinese import competition after China's entry in the WTO, and its consequences on output, value added and employment. There is evidence from prior work that U.S. firms responded negatively to this event including Autor et al. (2013), Acemoglu et al. (2014) or Hombert and Matray (2014). In Appendix Table B.2, we run a series of industry-level cross-sectional regressions assessing the effect of SC on the change in U.S. imports from China, U.S. exports to China, U.S.

[11]Note that contrary to within-industry changes in SC, within-industry changes in tariffs are negatively associated with imports.

net imports from China, and U.S. employment, output and value added between 2000 and 2007. Imports and exports are normalized by U.S. output plus imports. We control for the lag of the dependent variable, namely, the growth in trade flows and employment, output and value added between 1992 and 1999, thereby controlling for industry-specific trends. We also control for the tariff rate, log employment, log value added, log output, total factor productivity and total factor productivity growth, all measured in 1999, prior to China's entry in the WTO. Regressions are weighted by industry size in 1999. We find that a one standard deviation decrease in SC leads to a 1.1 and 1 percentage point increase in import penetration and net import penetration from China, respectively. This, in turns, drives a 7.8, 9 and 9.1 percentage points decrease in employment, output and value added, respectively. Hence, SC appear to be a strong predictor of the acceleration in Chinese import growth into the U.S. after China's entry in the WTO, and of its adverse consequences for the U.S. economy.

We then go further and show that more generally, low SC industries are much more sensitive to changes in import tariffs than high SC industries. We measure tariffs in each sector and year following Bernard et al. (2006b) and Fresard (2010), as the ratio of customs duties to the Free-on-Board value of imports.[12] We regress a series of industry-level variables measuring the change in import penetration, the growth in employment, value added and output, as well as stock returns on the change in tariffs and a vector of controls including the level of tariffs, import penetration, log employment, log value added and log shipments, as well as sector and year fixed effects. In Appendix Table B.3, we find that a 1 percentage point increase in tariffs leads to a 1 percentage point decrease in import penetration over the next six years. However, tariffs have no effect on import penetration in high SC sectors. This confirms that SC act as a protection against import penetration when tariffs drop. In Appendix Table B.4, we look at the effect of tariff changes on employment, shipment and value added growth. We find that a 1 percentage point increase in tariffs leads to an increase by 2% in employment growth, by 2.3% in output growth, and by 2.9% in value added growth, but only in low SC industries. Instead, high SC sectors do not experience any significant change in these outcomes. Finally, in Appendix Table B.5 we show that the lower performance of low SC sectors also translates into lower realized returns around tariff cuts, while high SC industries' returns remain unaffected.

2.2 The globalization risk premium

We then explore whether and how globalization is reflected in asset prices, by comparing the average excess returns of firms with high and low exposure to trade flows.

[12] We measure tariff changes as the difference in tariffs with respect to the previous year. We also build another variable called *Large tariff change* which is equal to the tariff change if it is larger than twice the median absolute tariff change in the sample, and zero otherwise. This variable is probably more likely to capture abrupt statutory tariff changes triggered by policy decisions, rather than gradual effective tariff changes due to the evolving composition of the bundle of imported goods.

Stock-level Data. We obtain stock returns data from the Center for Research in Security Prices (CRSP monthly file) and accounting data from Compustat. Our sample includes all manufacturing firms (4-digit SIC codes between 2000 and 3999 with non-missing data on SC) with ordinary stocks - that is with CRSP share codes of 10 or 11 - traded on the Amex, Nasdaq, or NYSE between 1975 and 2015 (the first year for which we can compute Shipping costs at the industry-level). We use the 4-digit SIC code from Compustat if available, and the 4-digit SIC code from CRSP otherwise. To reduce the impact of micro-cap stocks on our results, we also exclude stocks whose market capitalizations are below the 10th percentile of NYSE/AMEX stocks.[13] Over the sample period from 1975 to 2015, this leaves us with a sample of 531,201 stock-month observations with 5,854 distinct stocks.

In addition to stock returns, we also use data on analysts' annual earnings forecasts from the Institutional Brokers Estimates System (I/B/E/S) database, available from 1982 onwards.[14] Earnings and forecasts are all split-adjusted.

Finally, we retrieve data on stock characteristics from the CRSP-Compustat merged database. ME is the average portfolio market capitalization over the sample period converted into 2013 constant billions dollars. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO× item PRCC_F). Return on assets (ROA) is defined as operating income after depreciation and amortization (item OIBDP-item DP) divided by total assets. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT). Market leverage is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity.

We first form equally-weighted stock portfolios based on the quintiles of SC in their industry in the previous year. Panel A of Table 4 presents the characteristics and moments of the five portfolios and of a portfolio, referred to as "Hi-Lo", long in the highest SC portfolio and short in the lowest SC portfolio. Size is not systematically related to SC. While book-to-market ratios, market leverage and ROA are increasing with SC, the opposite applies to investment as a fraction of property plants and equipments. We find that firms in low SC industries have average returns that are 7.0 percent higher (annualized) than average returns in high SC industries. The Sharpe ratio of the long-short portfolio (Column 6) is 35 percent. A similar picture emerges from Panel B where we consider portfolios sorted on weight-to-value ratios: annualized returns are 8.6 percent higher on average in low weight-to-value ratio industries, and the Sharpe ratio is 36 percent. This large difference in returns between high and low SC industries is what we coin the globalization risk premium.

[13] In unreported tests, we find very similar results for the whole sample of stocks, and for alternative cutoffs, namely i) 20th NYSE/AMEX size percentile, ii) 30th NYSE/AMEX size percentile, and iii) 40th NYSE/AMEX size percentile.

[14] As noted by Diether, Malloy and Scherbina (2002), there is a rounding error problem in the standard I/B/E/S "Detail History" data set. We thus use data on analysts' forecasts unadjusted for stock splits; we then scale analysts' forecasts by the CRSP cumulative adjustment factor.

Portfolio analysis. A concern may be that the premium reflects the differential composition of these industries or their exposure to risk factors, irrespective of their actual exposure to international trade flows. We thus estimate abnormal excess returns as the residuals of the five factor model of Fama and French (2015), in which standard errors are adjusted using the Newey-West procedure with 12 lags. We confirm the risk premium we capture is not subsumed by loadings on classic risk factors, namely the market portfolio minus the risk-free rate, the size factor (small minus big), the value factor (high minus low), the profitability factor (robust minus weak), and the investment factor (conservative minus aggressive) – all obtained from Kenneth French's website. As evidenced in Panel A of Table 5, we find that the long-short portfolio alpha is -13.7 percent annually (t-statistic equals 3.0). Importantly, when portfolio returns are value-weighted, the long-short alpha is still statistically significant, at -5.2 percent annually (t-statistic equals 2.0). The excess returns on the value-weighted portfolio underscore that foreign shocks matter for investors' wealth. In Panel B, we obtain similar results when we sort stocks into quintiles of weight-to-value ratios. Finally, we present the cumulative excess (equally-weighted) returns of the long-short portfolio in Appendix Figure B.4.

European evidence. Is this pattern in returns restricted to the U.S.? We next explore whether the globalization risk premium is also observed in Europe. We consider stocks traded in sixteen European countries studied in Fama and French (2012) and used to compute the five factors for Europe: Austria, Belgium, Switzerland, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Ireland, Italy, the Netherlands, Norway, Portugal and Sweden. The five factors for Europe are all available on Kenneth French's website from July 1990, which is the beginning of our sample period for our portfolio analysis based on European stocks. Monthly returns and 4-digit SIC codes are both obtained from the EUROFIDAI database. As in Fama and French (2012), monthly returns are in U.S. dollars and monthly excess returns are returns in excess of the one-month U.S. Treasury bill rate.[15] For comparison purposes, we exclude stocks whose market capitalizations (in U.S. dollars) are below the 10th percentile of NYSE/AMEX stocks.[16] Over the sample period 1990-2015, this leaves us with a sample of 308,028 stock-month observations with 2,517 distinct stocks. In Table 6, we find that the long-short portfolio alpha is -10.2 percent annually (t-statistic equals 3.06), which is similar to the premium obtained from U.S. data. In Europe as well as in the U.S., the premium is statistically significant and economically large whether returns are equally or value-weighted, and whether we sort stocks in quintiles of SC or weight-to-value ratios both computed from U.S. import data.

[15]To check for robustness, we also estimate excess returns in euros. Prior to 1999, we rely on data from the Bank of England and use a synthetic euro exchange rate in order to convert national currencies. The synthetic euro is obtained by geometrically weighting the bilateral exchange rates of the (then) eleven euro area countries using "internal weights" based on the country shares of extra euro-area trade. We obtain virtually identical results.

[16]Again, we find very similar results for the whole sample of stocks.

Robustness. We assess the robustness of these findings in several ways. First, in Appendix Table B.6, we find similar results when we construct our portfolios based on quintiles of the sum of SC and trade tariffs, another impediment to trade. Second, we confirm in Appendix Table B.7 that our results are robust to computing weight-to-value ratios using U.S. export data instead of import data (Panel A), or using all international trades except U.S. imports and exports (Panel B). This mitigates concerns that our proxy for U.S. firms exposure to globalization is endogenous. One might also worry that SC might be picking up known factors present in currency returns. In Appendix Table B.8, we show that our results are similar when we include the dollar factor from Verdelhan (Forthcoming), the carry factor from Verdelhan (Forthcoming), or the excess return of high interest rates currencies minus low interest rate currencies from Lustig et al. (2011).[17] In a similar vein, we find in Appendix Table B.10 that our results are virtually unchanged when we augment the five factor model with momentum or the liquidity factor of Pastor and Stambaugh (2003). Finally, we show in Appendix Table B.9 that our results hold when we extend the sample to 1963-2015,[18] and when we split the sample into two subperiods 1975-1994, and 1995-2015.

Regression tests. As an alternative to our portfolio analysis, we run Fama-MacBeth regressions of monthly returns on our (continuous) SC and weight-to-value variables, after controlling for stocks' betas with the U.S. market return, market capitalization, book-to-market, return on assets, capital expenditures, and market leverage. The findings presented in Appendix Table B.14 confirm that stock returns are negatively correlated with our two measures of trade costs. This even holds after controlling for Gomes et al. (2009) classification of sectors into nondurable, durable, investment and other sectors (Appendix Table B.15).

Expected returns versus ex-post realized returns. A concern may be that the differences in stock returns we pick up across high and low SC industries could be caused by investors' misunderstanding of the real effects of import competition on firms' performance, instead of reflecting a risk premium. If, for instance, high SC industries experienced unexpected negative shocks throughout the sample period, this could explain why their returns are lower on average than those of low SC industries.

To mitigate this concern, we show that (i) the returns of our high and low SC portfolios are not concentrated around earnings announcements, and that (ii) equity analysts correctly estimated the negative effect of import competition on domestic firms over the sample period.

Earnings announcements returns. To show that the returns of high and low SC portfolios are not concentrated around earnings announcements, we gather all

[17]See the work of Lustig and Richmond (2015) and Richmond (2016) for recent studies of the empirical link of trade with currency risk premia.

[18]In order to extend our sample to pre-1975, we rely on the strong in-sample persistence of SC– see Table 2 – and use the 1975 SC measure to form portfolios over the period 1963-1975.

quarterly earnings announcement days from CRSP-Compustat merged database and I/B/E/S. When quarterly announcement dates are available in both the CRSP-Compustat merged database and in I/B/E/S and are different, we follow prior work and take the earlier date. We obtain announcement dates for our full sample period, 1975-2015.

For each stock, we denote the earnings announcement date as day 0, and we measure cumulative daily excess returns - raw returns minus the risk-free rate - around the earnings announcement date. Specifically, we report cumulative excess returns over a 7-day window - respectively 11-day window - from 1 day prior to the quarterly earnings announcement day to 1 day - respectively 5 days - after the announcement day, which we refer to as the (-5,1) window - respectively (-5,5) window. For all earnings announcements within a given calendar quarter, we then aggregate excess returns at the level of the SC and weight-to-value portfolios. For each quarter, these announcement returns are either equally-weighted or value-weighted with the stock market capitalization measured at the end of the calendar quarter prior to the earnings announcement.

Table 7 presents the results. The difference in (quarterly) earnings announcement returns for stocks in the low and high SC (and the low and high weight-to-value) portfolios is always not statistically significant. In annualized terms, this difference ranges between -0.66% (-0.165%*4) and 0.74% (0.185%*4), a negligible amount compared to the size of the globalization risk premium. Overall, this makes it unlikely that the market is learning much about the effect of import competition on earnings announcements days.

Analysts' earnings forecasts. We next use analysts' earnings forecasts to proxy for investors' earnings expectations, and examine whether they misperceived or correctly assessed the effect of import competition on firms' performance. Specifically, we first examine analysts' forecast errors over 1-year forecasting horizon, and estimate the following equation:

$$\text{FE}_{i,t} = \alpha + \beta \cdot \text{SC}_{i,t-1} + \gamma \cdot \text{Controls} + \kappa_t + \epsilon_{i,t},$$

where $\text{FE}_{i,t}$ the forecast error for stock i and year t, $\text{SC}_{i,t}$ the shipping costs of the 4-digit industry of stock i in year $t-1$, and κ_t are year fixed effects. The sample period is from 1982 to 2015. Standard errors are clustered at the industry level. We measure the forecast error as the difference between the I/B/E/S actual annual earnings per share and the mean I/B/E/S consensus forecast of annual earnings by share, measured as the average of the last forecast of each analyst covering the stock in the last 8 months before the end of the fiscal year.[19] In order to control for heteroskedasticity, we follow prior work and normalize the forecast errors by lagged stock price. Finally, we also present the results separately for the mean I/B/E/S consensus forecast of annual earnings per share, and the actual I/B/E/S annual earnings per share. If analysts

[19]This ensures that analysts know prior year earnings when making forecasts.

are surprised by lower (respectively higher) than expected operating performance by firms more exposed to import competition, we expect to find positive (respectively negative) coefficients on SC.

Table 8 presents the results. Columns 1 and 2 show that firms in high SC industries exhibit on average higher earnings per share and that analysts correctly predict this outcome. Importantly, the forecast error, which is shown in column 3, is small and non-statistically significant, which indicates that analysts were not surprised by the negative effects of import competition on firms' performance. We obtain the same results in Columns 4 to 6 where we also control for the beta of the stock, the logarithm of firm market capitalization, book-to-market equity, market leverage and investment. Finally, we obtain the same results in Columns 7 to 12 where we use weight-to-value as an alternative proxy for exposure to import competition.

We run additional robustness checks and present the results in Appendix Tables B.11 to B.13. First, we estimate the same equation as above in which we restrict our attention to stocks in the bottom and top quintiles of our SC (and weight-to-value) portfolios. Again, we find virtually no difference in analysts' forecast errors for stocks with low and high SC (respectively low and high weight-to-value). We also find similar results when we examine analysts' forecast errors over a longer horizon, namely for 2-year ahead earnings. Finally, we obtain virtually identical results using median I/B/E/S consensus forecasts when computing forecast errors (rather than mean I/B/E/S consensus forecast), and when forecast errors are normalized by lagged total assets per share (rather than lagged stock price).

Along with the analysis of earnings announcements, these findings do not provide support for the hypothesis that the ex-post average realized returns that we measure in the data deviate in a systematic way from the unobserved ex-ante expected returns for investors. Instead, this additional set of results provide strong credit to our explanation that exposure to import competition is a source of risk that is priced in the cross-section of stock returns.

The evidence consistently indicates that firms more exposed to globalization command a robust and substantial risk premium. This suggests that their performance covaries negatively with U.S. investors' marginal utility. While this is an unexpected finding in itself, it calls for further exploration. This premium can be driven by either a positive or negative joint reaction of U.S. firms' performance and investors' consumption to foreign shocks. In other terms, the price of risk of foreign shocks can either be positive or negative depending on the underlying economic mechanism, which is what we investigate next.

2.3 The sign of the price of risk

Our identification strategy to determine whether the price of the risk of foreign shocks is positive or negative relies on the well documented heterogeneity in firms' response to these shocks. Earlier work has found robust cross-sectional heterogeneity in firms ability to export, and firms propensity to be displaced by import competition. Bernard et al. (1995) and Bernard and Jensen (1999) show that exporters are systematically larger and more productive than non-exporters, a stylized fact that has been confirmed repeatedly in subsequent work. Conversely, low productivity firms have been consistently shown to be forced to exit when import competition intensifies, as evidenced in Pavcnik (2002), Trefler (2004), and Bernard et al. (2006b), among others.

Consistent with these stylized facts, following a positive foreign shocks, large and productive firms are more likely to benefit from enhanced export opportunities while lower productivity firms are more likely to be displaced by intensified foreign competition. We would therefore expect the price of risk to be positive if the premium is concentrated among the former, and negative if it is concentrated among the latter. Hence we form double-sorted portfolios based on shipping costs and either firm size or firm profitability. We measure size using market capitalization and productivity using return-on-assets (ROA). We independently sort stocks into five portfolios based on either their industry SC or weight-to-value ratio in the previous year, and into three portfolios based on either their market capitalization (Size) or their return on assets (ROA) in year $t-2$.

An alternative and more direct way to sort firms would be to use information on their export sales. This information is available from Compustat segment data, but it is unfortunately highly unreliable, due to inconsistent reporting requirements across years.[20] Instead, we search for the word "export" in the annual "10-K" report filed with the Securities and Exchange Commission (SEC), available on Edgar website from 1994. Using this procedure to proxy for firms' exporter status, we find in Appendix Table B.16 that the probability of exporting decreases with SC. Moreover, and consistent with the stylized facts highlighted above we find that being an exporter is positively correlated with size and profitability in our sample as well.

We present the returns of our double-sorted (3×5) portfolios in Table 9. We report the residual excess returns from the Fama-French five factor model for each of the five SC portfolios, as well as for the long-short portfolio. In the lowest size tercile, an equally-weighted portfolio that goes long high SC and short low SC has an alpha of -18.4%. This difference decreases to -12.3% in the highest size tercile. Similarly, we find the long-short portfolio alpha to be -16.6% in the bottom ROA tercile while it falls to -8.6% in the top ROA tercile.[21] If anything, the difference across size and ROA terciles is larger when double-sorted portfolio returns are value-weighted. In that case, the Hi-Lo SC portfolio has an alpha of -17.8% in the lowest size tercile (respectively -17.2% in the lowest ROA tercile) and -5.08% in the highest

[20] As an illustration of this inconsistency, the average yearly number of firms reporting export sales from a domestic segment drops fivefold from 1679 in the 1990s to 325 in the 2000s.

[21] We also form double-sorted portfolios based on shipping costs and *exporter status* obtained by counting words associated with the word "exporter" in the annual 10-K report filed with the SEC. We find in Appendix Table B.17 that excess returns for the long-short SC and weight-to-value portfolios are stronger among non-exporters that among exporters, in particular when returns are value-weighted.

size tercile (respectively -3.4% in the highest ROA tercile). The annual difference of 12.7% (respectively 13.8%) is both economically and statistically significant. In addition, as evidenced in Panel B, results are similar when portfolios are constructed based on weight-to-value ratios. Finally, Fama-MacBeth specifications presented in Appendix Tables B.14 and B.15 also confirm that the sensitivity of returns to SC and the weight-to-value ratio is strongest among small and low productivity firms. Taken together, these findings indicate that the globalization risk premium is concentrated among firms that are more likely to be negatively affected by foreign shocks, both because they are more likely to be displaced by foreign competitors, and because they are less likely to be productive enough to benefit from enhanced export opportunities.

To further establish that the price of risk is negative, we asses firms' response to foreign productivity shocks. If the price of risk is negative, firms' cash-flows and returns should respond negatively when such a productivity shock materializes, and conversely. To proxy for a foreign productivity shock, we draw from from Zhu (2012) who shows that Chinese import growth is driven mostly by the increase in Chinese productivity. We consider our SC (and weight-to-value) portfolios and compute their exposure to Chinese import growth as the coefficient β of the following OLS regression estimated at the monthly frequency over the sample period:

$$R_{J,t}^{EW} = \beta_J \cdot \text{ChImpGr}_t + \alpha_J + u_{J,t},$$

where $R_{J,t}^{EW}$ is the equally-weighted portfolio excess return in month t for industry portfolio J and ChImpGr_t is the growth rate of Chinese imports to the U.S. between month t and the same month in the previous year.

We present the results in Table 10. The first line shows that the five SC portfolios have a negative β on Chinese import growth, and that this sensitivity is stronger for the low SC portfolio. We find the same pattern when we consider weight-to-value portfolios. This confirms that firms more exposed to globalization indeed react more negatively to a positive foreign productivity shock. We then compute the exposure of double-sorted portfolios using terciles of size and terciles of ROA. Again, we find that portfolios load negatively on Chinese import growth, and that low SC portfolios have more negative loadings. The difference in loadings between the high and low SC portfolios is largest among firms that are more likely to suffer from import competition, namely, small and low ROA firms. As a robustness test, we compute Chinese import growth betas after controlling for exposure to the U.S. market portfolio and find similar results (see Appendix Table B.19).

High and low SC industries may be differentially affected by foreign productivity shocks not only through import competition and expansion on foreign markets, but also through more efficient sourcing (Amiti and Konings, 2007; Goldberg et al., 2010; De Loecker et al., 2012). If there is a lot of within-industry trade, then low SC industries might benefit from importing cheaper intermediate inputs than high SC industries. This mechanism is likely to boost the risk premium if the price of risk is positive, and to dampen the risk premium if the price of risk is negative. We check in Appendix Table B.20 that our baseline results hold after excluding firms in 4-digit industries that source more than 5% of their inputs from within their own industry. Moreover, our finding that the price of risk is negative suggests that the import competition mechanism dominates any positive sourcing effects. This might be due to the fact that small and less productive firms, that are most likely to be displaced by import competition and not to benefit from exporting opportunities, are also less likely to benefit from better sourcing opportunities (Bernard et al., 2007).

Taken together, these findings indicate that the price of risk is negative. Given the potential domestic benefits associated with foreign shocks including gains from variety, lower prices, and enhanced export opportunities, this finding is a puzzle. It suggests that the displacement risk associated with foreign shocks outweighs their benefits from the perspective of domestic investors. Under what conditions can a standard international trade model rationalize this finding? This is what we explore next.

3 Model

We build on Ghironi and Melitz (2005) and develop a standard model of international trade with asset prices to ask whether and how it can rationalize the globalization risk premium. We contribute to the literature of international trade and macroeconomic dynamics by adding a cross-section of industries with heterogeneous trade costs. This heterogeneity generates differential exposure to globalization across industries, which is instrumental to understand how aggregate factors drive the cross-section of expected returns documented in Section 2. We first derive predictions for firms' exposure to foreign productivity shocks, across industries as well as within industries. We then formulate identification restrictions on the sign of the price of risk. Finally we calibrate the model and show that it cannot explain the globalization risk premium in the case of perfect risk-sharing, but that introducing frictions to risk-sharing allows us to reconcile the model with the data.

3.1 Setup

We follow Ghironi and Melitz (2005) and consider the Chaney (2008) version of the Melitz (2003) model: we assume there is a fixed number of firms in each industry. We focus on quantities on the domestic country and denote all foreign variables with an asterisk ($\star$). We leave derivations of the model in Appendix A.1.

Demand side — There is a continuum of homogeneous households in each country with Epstein and Zin (1989) preferences. They maximize their continuation utility J_t over sequences of the consumption index C_t:

$$J_t = \left[(1-\beta)C_t^{1-\psi} + \beta\left(\mathsf{R}_t(J_{t+1})\right)^{1-\psi}\right]^{\frac{1}{1-\psi}},$$

where β is the time-preference parameter and ψ is the inverse of the intertemporal elasticity of substitution (IES). $\mathsf{R}_t(J_{t+1}) = [\mathbf{E}_t\{J_{t+1}^{1-\nu}\}]^{1/(1-\nu)}$ is the risk-adjusted continuation utility, where ν is the coefficient of relative risk aversion.[22] Each period consumers derive utility from the consumption of goods in $\mathcal{J}+1$ sectors. Sector 0 provides a single homogeneous good. The other $\mathcal{J}$ sectors are made of a continuum of differentiated goods. If a consumer consumes quantity c_0 of the homogeneous good, and $c_J(\omega)$ units of each variety ω in sector J, she receives intratemporal utility C_t:

$$C_t = c_0^{1-a_0} \left[\sum_J \left(\int_{\Omega_J} c_J(\omega)^{\frac{\sigma_J - 1}{\sigma_J}} d\omega \right)^{\frac{\sigma_J}{\sigma_J - 1} \frac{\theta - 1}{\theta}} \right]^{\frac{\theta}{\theta-1} a_0},$$

where $0 < a_0 < 1$ represents the expenditure share on the manufacturing sector, $\theta > 1$ is the elasticity of substitution across industries, σ_J is the elasticity of substitution across varieties in sector J (which is assumed to be higher than θ), and Ω_J is the set of firms producing in the domestic economy in industry J which is determined in equilibrium. Households get revenues from both their inelastic labor supply in quantity L and from ownership of a world mutual fund that redistributes profits of both domestic and foreign firms. Their budget constraint reads:

$$\sum_J \int_{\Omega_J} p_J(\omega) c_J(\omega) \mathrm{d}\omega \leq wL + \Pi,$$

where $p_J(\omega)$ is the price of variety ω in industry J, w is the market price of labor, Π is the profit redistributed to domestic consumers through ownership. We specify the structure of firm ownership below.

Supply side — The homogeneous good 0 is freely traded and is used as the numeraire in each country. It is produced under constant returns to scale with one unit of labor producing one unit of good 0. Its price is set equal to 1 such that in equilibrium we can interpret productivity changes across countries as real productivity changes.

Each firm in the other $\mathcal{J}$ industries produces a differentiated variety ω in quantity $y_J(\omega)$, using one single factor, labor, in quantity $l_J(\omega)$. Firms are heterogeneous and produce each variety with different technologies indexed by φ, their idiosyncratic productivity. We index aggregate productivity by A_t. Hence a domestic firm with idiosyncratic productivity φ, produces $A_t \varphi$ units of variety ω per unit of labor.

We are mostly interested in the impact on domestic firms of productivity shocks in the foreign country $A^\star$. We assume productivities in each country, $(A, A^\star)$, both follow an AR(1) process in logarithm, $\log A_{t+1} = \mu_A + \rho_A \log A_t + \varepsilon_{t+1}^A$ and $\log A_{t+1}^\star = \mu_{A^\star} + \rho_{A^\star} \log A_t^\star + \varepsilon_{t+1}^{A^\star}$. We allow for different levels of productivity across countries through

[22] In the case of time-separable preferences with constant relative risk aversion (CRRA), the IES is equal to the inverse of the coefficient of risk aversion.

μ_A and $\mu_{A^\star}$. Idiosyncratic productivity is fixed over time but randomly assigned across firms. As in Helpman et al. (2004), the distribution of idiosyncratic productivity in each industry is Pareto with tail parameter $\gamma_J > \sigma_J - 1$. The probability of a firm productivity falling below a given level φ in industry J is $\Pr\{\tilde{\varphi} < \varphi\} = G_J(\varphi) = 1 - \left(\varphi/\underline{\varphi}_J\right)^{-\gamma_J}$. The lower bound of idiosyncratic productivity for industry J is $\underline{\varphi}_J$. A larger γ_J corresponds to a more homogeneous industry, in the sense that more output is concentrated among the smallest and least productive firms. Firms operate on both their domestic market and the export market. To export, a firm needs to pay a variable "iceberg" trade cost $\tau_J \geq 1$ and a fixed cost f_J measured in labor efficiency units that is paid every period.

Firms operate in a monopolistic competition setting in each industry, and behave as price setters. Given that demand is isoelastic, they set their prices at a markup over marginal cost. A firm with productivity φ sets the domestic price $p_J(\varphi) = \frac{\sigma_J}{\sigma_J - 1}/(A\varphi)$ and for the exporting market it sets $p_{X,J}(\varphi) = \tau_J p_J(\varphi)$. Firms earn profits $\pi_J(\varphi)$ from both their operations on domestic markets, $\pi_{D,J}(\varphi)$ and on export markets, $\pi_{X,J}(\varphi)$. Domestic profits are free of flow costs

$$\pi_{D,J}(\varphi) = \frac{1}{\sigma_J}\left(\frac{p_J(\varphi)}{P_J}\right)^{1-\sigma_J} \cdot P_J C_J,$$

where P_J is industry's J price index and C_J is the industry composite good, aggregated from the set of differentiated goods.[23] Export profits include the flow cost of exporting f_J

$$\pi_{X,J}(\varphi) = \frac{1}{\sigma_J}\left(\frac{p_{X,J}(\varphi)}{P_J^\star}\right)^{1-\sigma_J} \cdot P_J^\star C_J^\star - \frac{f_J}{A}.$$

All firms produce on domestic markets, but a firm will export if and only if it makes positive profits from doing so. This is the case as long as a firm's idiosyncratic productivity is above a certain cutoff which we define as $\varphi_{X,J} = \inf\{\tilde{\varphi} | \pi_{X,J}(\tilde{\varphi}) > 0\}$.

The mass of firms M_J in each industry is fixed. There is no entry or exit in and out of an industry. However the set of producers in a given market, Ω_J, does vary over time due to trade. Each firm makes an optimal decision to export based on its idiosyncratic productivity, aggregate productivity and the flow export cost, such that $\varphi_{X,J}$ fluctuates over time.

Following Melitz (2003), we define productivity averages for all producing firms in the domestic market, $\bar{\varphi}_{D,J}$, and in the export market, $\bar{\varphi}_{X,J}$. These average productivity levels summarize all the information from the firm distribution for the equilibrium of the model:

$$\bar{\varphi}_{D,J} = \left(\int_{\underline{\varphi}_J} \varphi^{\sigma_J - 1} dG_J(\varphi)\right)^{\frac{1}{\sigma_J - 1}}, \qquad \bar{\varphi}_{X,J} = \left(\frac{1}{1 - G_J(\varphi_{X,J})}\int_{\varphi_{X,J}} \varphi^{\sigma_J - 1} dG_J(\varphi)\right)^{\frac{1}{\sigma_J - 1}}.$$

[23]We show formally in Appendix A.1 that the consumption index is $C_J = \left(\int_{\Omega_J} c_J(\varphi)^{\frac{\sigma_J - 1}{\sigma_J}} d\varphi\right)^{\frac{\sigma_J}{\sigma_J - 1}}$, and the price index is $P_J = \left(\int_{\Omega_J} p_J(\varphi)^{1-\sigma_J} d\varphi\right)^{\frac{1}{1-\sigma_J}}$.

We show that average profits of firms domestic operations are $\pi_{D,J}(\bar{\varphi}_{D,J})$ and average profits for exporting operations are $\pi_{X,J}(\bar{\varphi}_{X,J})$. We define the fraction of firms that decide to export as $\zeta_J = \Pr\{\varphi > \varphi_{X,J}\}$. Finally we express the profits of domestic firms from all their operations as

$$\Pi_J = M_J \left[\pi_{D,J}(\bar{\varphi}_{D,J}) + \zeta_J \cdot \pi_{X,J}(\bar{\varphi}_{X,J})\right].$$

Equilibrium — The aggregate budget constraint can be expressed in terms of the final composite consumption good, C, the aggregate price index, P, and the revenues of firms flowing back to households, Π such that in each country we have: $PC \leq L+\Pi$.

Under financial autarky, as it is the case in Ghironi and Melitz (2005), households only receive the proceeds of domestic firms operations such that $\Pi_{\text{AUT}} = \sum_J \Pi_J$. Under perfect risk-sharing, households receive a share of world industry profits, relative to their capital endowments, $\Pi_{\text{RS}} = \sum_J \frac{M_J}{M_J + M_J^\star} \cdot (\Pi_J + \Pi_J^\star)$. We capture the degree of risk-sharing with a parameter Ξ which ranges from financial autarky, $\Xi = 0$, to full risk-sharing, $\Xi = 1$.[24] Revenues flowing back to households are a convex combination of both polar cases:

$$\Pi(\Xi) = \Xi \cdot \Pi_{\text{RS}} + (1 - \Xi) \cdot \Pi_{\text{AUT}}.$$

We solve for an endowment economy, where the mass of firms in an industry is constant over time. The only production adjustments are in and out of exporting. We define an equilibrium as a collection of prices $(p_J, p_{X,J}, P_J, P_T, P)$, output $y_J(\varphi)$, consumption $c_J(\varphi)$, labor demand $l_J(\varphi)$ such that: (a) each firm maximizes profit given consumer demand; (b) consumers maximize their intertemporal utility given prices; (c) markets for goods and for labor clear.

Practically there are $2 \cdot (\mathcal{J} + 1)$ endogenous variables in the model: the aggregate consumption level in each country, $(C, C^\star)$, and the industry level export cutoffs: $(\varphi_{X,J}, \varphi_{X,J}^\star)$. Knowing these quantities is sufficient to solve for the equilibrium at each point in time. All the equilibrium equations are summarized in Appendix Table A.1.

Asset prices — We are interested in asset prices of domestic firms across different industries. Since the representative household holds these firms, they are priced using her stochastic discount factor. She maximizes her utility subject to her budget constraint, which includes investments $x_{J,t}(\varphi)$ in firms of industry J of variety φ at a price $v_{J,t}(\varphi)$, the firm valuation. Firms pay out dividends which are equal to profits, $\pi_{J,t}(\varphi)$, and there is no investment. We derive the consumption-CAPM Euler equation, $v_{J,t}(\varphi) = \mathbf{E}_t\{S_{t,t+1}\left(v_{J,t+1}(\varphi) + \pi_{J,t+1}(\varphi)\right)\}$, where $S_{t,t+1}$ is the one period ahead stochastic discount factor (SDF). To understand how investors price firms in

[24] Our risk-sharing arrangement is exogenous. For empirical evidence of home bias in U.S. investors' portfolio and a deviation from full risk-sharing, see for instance example Coval and Moskowitz (1999); Ivković and Weisbenner (2005); Rauh (2006); Brown et al. (2009); Baik et al. (2010); Bernile et al. (2015).

our model, we analyze below how aggregate shocks affect their marginal utility and how cash-flows react to these shocks.

3.2 Mechanism

In this Section we articulate the link between shocks to foreign aggregate productivity $A^\star$, firms' cash flows, and the marginal utility of domestic investors. In particular, we highlight the differences in firms' response to foreign productivity across low and high trade costs industries. This allows us to shed light on the model and its interpretation: the joint response of cash-flows and the SDF ultimately determine the risk across industries and how this risk is priced in the economy.

3.2.1 Cash-flows

We explicitly characterize in the Appendix the effect of an increase in productivity in the foreign country on both domestic profits and export profits. The following proposition summarizes differences in firms' profits elasticities to foreign productivity shocks across low and high trade costs industries.

First, note that import penetration – defined in the Appendix in a given industry as the ratio of consumption of foreign goods in the domestic country over total domestic consumption – is decreasing with trade costs τ. In high trade costs industries, foreign firms are less competitive as their prices increase with τ; moreover at the extensive margin, fewer foreign firms choose to enter the domestic market in these industries as it is harder to make profits.

Proposition 1. *Consider two industries* (L, H) *in the same country. If trade costs are lower in industry* L*, that is* $\tau_L < \tau_H$*, then:*

(a) The elasticity of profit to a shock to foreign productivity $A^\star$ *for small (non-exporters) firms is more negative in industry* $L : \mathcal{E}^\star(\pi_L)_{\text{small}} < \mathcal{E}^\star(\pi_H)_{\text{small}}$.

(b) The difference in the elasticity of profit between low and high trade costs industries is larger (in absolute value) for small firms than for large firms: $(\mathcal{E}^\star(\pi_L) - \mathcal{E}^\star(\pi_H))_{\text{small}} < (\mathcal{E}^\star(\pi_L) - \mathcal{E}^\star(\pi_H))_{\text{large}}$.

(c) The difference in the elasticity of profit for small firms between low and high trade costs industries $((\mathcal{E}^\star(\pi_L) - \mathcal{E}^\star(\pi_H))_{\text{small}})$ *is more negative i) in high demand elasticities* (σ) *industries; and ii) in high Pareto tail parameter* (γ) *industries.*

The first part of the proposition, *(a)*, is specific to small firms. These firms only receive cash-flows from domestic operations as their productivity is below the exporting cutoff. In low trade costs industries, the pass-through of foreign shocks into domestic markets is larger: this leads to an amplification of the rise in competition from foreign firms, and subsequently to a larger drop in profits for domestic firms.[25]

[25] This proposition could also be stated with firm's profitability (high vs low profitability) or export status (exporter vs non-exporter), since these characteristics are isomorphic in the model.

Statement *(b)* relates to the difference between small and large firms in their response to foreign productivity shocks. Large firms are above the export cutoff and benefit from enhanced export opportunities, as the foreign economy grows with productivity. As a result, they typically suffer less from foreign productivity shocks than small firms.

Finally, the last part of the proposition, *(c)*, focuses on the interaction between trade costs and both the elasticity of substitution and the Pareto tail parameter at the industry level. When foreign firms become more productive, they increase their market share on domestic markets and displace domestic firms. This business stealing effect operates both at the intensive margin – existing exporters increase their market shares, and at the extensive margin – new foreign firms enter domestic markets. Business stealing effects are magnified at the intensive margin in high demand elasticity (σ) industries, and at the extensive margin in high Pareto tail parameter (γ) industries. As a result, the negative effect of a foreign productivity shock on small (non-exporting) firms is stronger in high σ industries, and in high γ industries.

3.2.2 Marginal utility of consumption

For domestic investors their marginal utility responds to foreign shocks as follows:

$$\mathcal{E}^{\star}(C) = \underbrace{-\mathcal{E}^{\star}(P)}_{\text{Price effect}} + \underbrace{\frac{\Pi}{L+\Pi} \cdot \mathcal{E}^{\star}(\Pi(\Xi))}_{\text{Wealth effect}}$$

Two effects of trade compete in their role for aggregate consumption: a standard price effect where import competition lowers monopoly power in each industry, increases variety and lowers prices; and a wealth effect, since total household expenditures depend on the dividends received from firms.

The price of the risk of foreign shocks depends on the relative magnitude of these two effects.[26] In the next section, we formulate and test predictions that allow us to identify the sign of the price of risk in the data.

3.3 Identifying the price of risk in the model

Equilibrium returns — We focus on shocks to foreign productivity, $A^{\star}$. The representative household's first order condition, the Euler equation, determines industries' asset returns, $\mathbf{E}_t\{S_{t,t+1}\mathbf{R}_{J,t+1}\} = 1$. We are in the framework of the consumption-CAPM, where expected returns are the price of risk multiplied by the risk exposure of an industry and of the firms within. To hold stocks in industries with negative exposure to trade shocks ($\mathcal{E}^{\star}(\pi_J) < 0$), investors command a positive (negative) risk premium if the price of risk is negative (positive), so that industries with stronger

[26]In the calibration exercise presented below, we find the wealth effect to be positive in the case of perfect risk sharing, and negative when risk sharing is sufficiently limited.

negative exposure to foreign productivity shocks will have higher (lower) expected returns than industries with small exposure.

The key idea to identify the sign of the price of risk is to analyze whether the difference in expected returns in high and low trade costs industries (in our empirical tests, high and low SC industries) emanates from firms and industries that do suffer relatively more from foreign productivity shocks. We formulate in the following Proposition testable predictions that identify the sign of the price of risk given the cross-section of equity returns.

Proposition 2. *Denote returns in low and high trade costs industries, R_L and R_H, respectively. Suppose that $\mathbf{E}\{R_L\} > \mathbf{E}\{R_H\}$. Observing whether the difference between R^L and R^H is lower or larger between small and large firms; and within small firms, whether the difference between R^L and R^H is lower or larger for (i) low or high demand elasticity industries, and (ii) low or high Pareto tail parameter industries, allows to infer the sign of the price of risk. Specifically:*

(a) If $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{small}} > (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{large}}$, then the price of risk is negative. Otherwise, it is positive.

(b) If $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{small, high-}\sigma} > (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{small, low-}\sigma}$, then the price of risk is negative. Otherwise, it is positive.

(c) If $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{small, high-}\gamma} > (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{small, low-}\gamma}$, then the price of risk is negative. Otherwise, it is positive.

Taking the predictions to the data. These predictions are connected to the mechanics of the model detailed in Proposition 1. Only large and productive firms export. As the foreign economy grows with foreign productivity, large firms are less affected by foreign productivity shocks as compared to small firms. Whether the difference in expected returns between high and low SC is more pronounced among small or large firms allows to distinguish if the price of risk is positive or negative. This result provides a theoretical foundation for our finding in Section 2 that the globalization risk premium is concentrated among smaller and less productive firms (Table 9), and that the price of risk is therefore negative.

The statements *(b)* and *(c)* provide testable implications for identifying the sign of the price of risk in the cross-section of expected returns of small firms, those that are below the cutoff for exporting. As discussed in Section 3.2.1, the elasticity of substitution and the Pareto tail parameter of the distribution of firms' productivities amplify the displacement effects of a shock to foreign productivity in the domestic economy.

First, a greater elasticity of substitution leads to a larger negative elasticity of cash-flows for non-exporters. Analyzing the expected returns of high-minus-low SC portfolios in high and low demand elasticity industries allows us to determine if the risk premium is due to covariance with a factor that increases or decreases consumption growth. Intuitively, displacement risk is lower in an industry where consumers are less sensitive to prices. To test whether this prediction is found in the data, we independently sort stocks into five portfolios based on either their industry's SC or weight-to-value ratio in the previous year, and into two portfolios based on their industry demand elasticity (σ), in a sample restricted to either small or low productivity firms. Specifically, we restrict respectively the sample to stocks with market capitalization (size) below the sample median in the previous month; and to stocks of firms with ROA below the median in year $t-2$. U.S. demand elasticities are estimated by Broda and Weinstein (2006) from 1990 to 2001 at the commodity level, and aggregated at the four-digit SIC based on total imports over 1990-2001.[27] We present the results in Table 11. Whether portfolios are based on shipping costs or weight-to-value ratios, and whether portfolio returns are equally or value-weighted, we find the excess returns of exposed firms to be concentrated in high demand elasticity industries, consistent with a negative price of risk.

Finally when the distribution of foreign firms' productivities has a high Pareto-tail parameter, the displacement effect of foreign productivity shocks on domestic firms is stronger through the extensive margin - as more foreign firms enter domestic markets. Comparing the expected returns of high-minus-low SC portfolios in high and low Pareto-tail parameter industries in a sample of small or low-productivity firms therefore allows us to recover the sign of the price of risk. We estimate the Pareto parameter separately for each industry-year as the coefficient γ of the following OLS regression:

$$\log(\text{SIZE}_i) = -\gamma_J \log(\text{RANK}_{i\in J}) + u_i,$$

where for each year and 4-digit industry, firms are ranked in descending order according to their size measured as total firm market value. We form double-sorted (2×5) portfolios based on shipping costs and the Pareto tail parameter. Table 12 presents estimates of excess returns from a Fama-French five factor model for each SC or weight-to-value portfolio, separately for high and low Pareto tail parameter (γ) industries. The long-short portfolio has more negative excess returns in high γ industries.

In summary, the model predicts that if the price of risk of foreign productivity shocks is negative, the risk premium should be concentrated i) among small and less productive firms; and ii) within the sample of small and less productive firms, in industries with a higher demand elasticity, and in industries with a high Pareto tail parameter.[28] We find that all these predictions hold in the cross-section of expected returns, and hence that the price of risk is negative. We next turn to a calibration of

[27]Broda and Weinstein (2006) estimate import demand elasticities from disaggregate ten-digit Harmonized System (HS) product-level trade data. We average these up to the SIC industry level using U.S. import trade values as weight. This provides us with a good proxy for σ_J in the model, the elasticity of substitution across varieties in each sector J.

[28]To check for robustness, in Table B.18, we re-estimate excess returns when the sample is restricted to non-exporters – obtained by counting words associated with the word "exporter" in the annual 10-K report filed with the SEC –, and find similar results: the excess returns of non-exporters are concentrated in high demand elasticity and high Pareto tail parameter industries.

the model to check whether and how the response of domestic consumption to foreign productivity shocks can be consistent with a negative price of risk.

3.4 Calibration

Can the model rationalize the globalization risk premium documented in Section 2? To address this question, we calibrate our model with two countries, two industries, and an homogeneous good sector.

We first closely follow Ghironi and Melitz (2005) to fix several parameters of our calibration. We set the subjective discount rate $\beta = 0.99$, the IES $\psi = 1.5$, and the coefficient or risk aversion at $\nu = 20$. For the market structure within industries we take values from Ghironi and Melitz (2005) and we assume $\sigma = 3.8$ for the elasticity of substitution across varieties, and $\gamma = 3.4$ for the Pareto tail parameter. Our choice of trade costs $\tau = 1$ and $\tau = 1.5$ in respectively the most exposed and less exposed industries is also closely in line with the average trade costs in Ghironi and Melitz (2005). For the elasticity of substitution across industries we follow Loualiche (2015) and take $\theta = 1.2$. Table 13 summarizes our choice of calibration parameters.

We then set the ratio of foreign labor to domestic labor to 3, thereby matching the ratio of the working-age population in China relative to the U.S. Our choice of baseline productivities $\mu_{A^\star} = 1$ and $\mu_A = 7$ across countries matches GDP per capita in China relative to the U.S. $\sigma_A = 1.6\%$ and $\rho_A = 0.976$ are calibrated to fit U.S. GDP whereas $\sigma_{A^\star} = 6\%$ and $\rho_{A^\star} = 0.976$ are calibrated to fit China imports to the U.S. The remaining free parameters are the fixed costs of exporting in low and high trade costs industries and the relative mass of firms. We calibrate these parameters to match real quantities, namely both the level of import penetration and their volatility in low and high trade costs industries in the U.S. Our calibration implies that exporters are between 1.2 and 1.4 times more productive that non-exporters.

In Table 14, we report the moments of the data we match using the model. We focus on matching the dynamics of trade flows in industries with high and low exposure to import competition. We fit four moments, the average and standard deviation of import penetration for both industries. The calibration does not specifically target firms cash flows across industries but fits firms' average cash-flows and their standard deviation.

In Figure 1, we present impulse response functions (IRFs) of domestic consumption and asset prices to foreign productivity shocks, separately for an economy with no risk-sharing (top panel), and an economy with perfect risk-sharing (bottom panel). Under perfect risk-sharing, valuations decrease after a foreign productivity shock, especially for low trade costs (High Trade Exposure) industries, and consumption goes up. This generates a negative risk premium, and a positive price of the risk of foreign shocks, which is contrary to our empirical findings in Section 2.

By contrast, under no risk-sharing, as the shock hits, valuations decrease but so does consumption. This is consistent with a positive risk premium on exposed firms, and with a negative price of risk, in line with the empirical estimates of the globalization risk premium in Section 2. Domestic consumption moves in response to two forces: a price effect whereby consumption becomes cheaper due to more productive varieties being imported from the foreign country; and a wealth effect that depends on the value of households' portfolio. Under no risk-sharing ($\Xi = 0$), the wealth effect is negative and dominates. In that case, domestic consumption responds negatively to (positive) foreign productivity shocks.

We next focus on the case with no risk-sharing and explore model dynamics further. In Figure 2, we plot the IRFs of import penetration, the fraction of exporters and domestic profits for high and low trade costs sectors.[29] The larger elasticity of imports to foreign productivity shocks in low trade costs industries is reflected in cash-flows: the profit response of low trade costs industries is 4% more negative.[30] This difference in cash-flows leads to the difference in valuations highlighted above.

Given the response of valuations and consumption, we can explore how investors perceive the risk of foreign productivity shocks. Qualitatively, as consumption declines when foreign productivity increases, consumption is dear exactly at times when firms' cash-flows are negative. Because investors seek protection to hedge against this source of systematic risk, firms doing poorly when consumption is low trade at a discount relative to firms with high cash-flows in these states of the world. The price of the risk of foreign shocks is therefore negative.[31]

Finally, we let the risk-sharing parameter Ξ vary between zero and one, from financial autarky to full risk-sharing. Figure 3a shows the average returns for both low and high trade cost industries, and the risk free rate, whereas Figure 3b presents the elasticity of consumption to foreign productivity shocks. As anticipated, the consumption response becomes less negative when risk-sharing increases. As a consequence, the risk premium for exposure to import competition declines with the level

[29] For a discussion of the response of the real exchange rate to foreign productivity shocks, see Appendix A.3.2 and Appendix Figure A.2.

[30] One may wonder whether we would obtain symmetric responses to domestic productivity shocks. In Appendix Figure A.1, we present the IRFs of trade quantities and profits to domestic shocks. While low trade costs industries appear to benefit more from the shock, the effect is tenuous. The IRF of profits to domestic shocks only goes up to 0.25%, a small response when compared to the magnitude of the impact of foreign shocks (-7.5%). Domestic productivity shocks are thus unlikely to be the driver of the globalization risk premium.

[31] Quantitatively, our baseline calibration - with a relative risk aversion parameter equal to 20 - delivers a globalization risk premium of 0.4% (see the third panel of Table 14), and an aggregate equity premium in the domestic economy of around 1%. This difference in excess returns across industries falls short of our empirical estimates of 7.0%. As is well known, it is difficult to generate a high equity premium of stock returns in a general equilibrium model, especially in models with production. Note however that if we use instead a level of risk aversion calibrated to match an aggregate risk premium of 5% (that we could consider as a reduced form for other types of shocks that are known to generate large risk premia even with "normal" levels of risk aversion, see for e.g. Rietz (1988) and Barro (2006)), the model then generates a difference in average returns between low and high trade costs industries of around 2%, closer to what we find in the data.

of risk-sharing. In particular, the consumption response changes sign and becomes positive for a risk-sharing parameter above 0.9. In this region, the risk premium also changes sign and becomes negative, inconsistent with the globalization risk premium we document empirically.[32]

In summary, the model can generate positive excess returns for low trade cost firms when some frictions to risk-sharing are introduced. There may be other ways to generate this negative response of domestic consumption to foreign shocks[33] and explain the globalization risk premium: we leave them to future research.

4 Conclusion

This paper studies how globalization is reflected in asset prices, and thus how investors perceive the domestic consequences of foreign productivity shocks. We use shipping costs to measure firms' exposure to globalization. We find that firms in low shipping costs industries carry a 7 percent risk premium, suggesting that their cash-flows covary negatively with investors' marginal utility. This premium can be driven by either a positive or negative joint reaction of firms' performance and investors' consumption to foreign productivity shocks. We find that the premium emanates from the risk of displacement of least efficient firms triggered by import competition. These findings suggest that foreign productivity shocks are associated with times when consumption is dear for investors. We attempt to rationalize this puzzle within a standard two-country dynamic general equilibrium model of trade (Melitz, 2003) with asset prices. Under perfect risk-sharing, the model cannot rationalize our findings. When we allow for limited risk-sharing, the model predictions can be consistent with our empirical findings. Other types of financial frictions could be introduced to rationalize the globalization risk premium: we hope this will motivate future research.

[32] In Appendix A.3.3, we follow Ghironi and Melitz (2005) and allow for the trading of bonds across countries to check whether this might affect our results. We find that the introduction of risk-sharing through a risk-free security does not affect the risk premia generated by the model.

[33] For instance, Demidova (2008) assumes that domestic and foreign firms draw idiosyncratic productivities from different distributions and shows that a foreign productivity shock can reduce domestic consumption and welfare.

References

Acemoglu, Daron, David Autor, David Dorn, Gordon H. Hanson, and Brendan Price, "Import Competition and the Great U.S. Employment Sag of the 2000s," *NBER Working Paper*, 2014.

Amiti, Mary and Jozef Konings, "Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia," *American Economic Review*, 2007, *97* (5), 1611–1638.

_ , Mi Dai, Robert C Feenstra, and John Romalis, "How Did China's WTO Entry Benefit US Consumers?," 2016.

Anderson, James E. and Eric van Wincoop, "Trade Costs," *Journal of Economic Literature*, 2004, *42* (3), 691–751.

Autor, David H., David Dorn, and Gordon H. Hanson, "The China Syndrome: Local Labor Market Effects of Import Competition in the United States," *American Economic Review*, 2013, *103* (6), 2121–68.

_ , _ , _ , and Jae Song, "Trade Adjustment: Worker Level Evidence," *Quarterly Journal of Economics*, 2014, *129* (4), 1799–1860.

Baik, Bok, Jun-Koo Kang, and Jin-Mo Kim, "Local Institutional Investors, Information Asymmetries, and Equity Returns," *Journal of Financial Economics*, 2010, *97* (1), 81–106.

Bansal, Ravi and Amir Yaron, "Risks for the Long Run: A Potential Resolution of Asset Pricing Puzzles," *Journal of Finance*, 2004, *59* (4), 1481–1509.

_ , Dana Kiku, and Amir Yaron, "Risks For the Long Run: Estimation and Inference," Technical Report, Duke University 2007.

Barro, Robert J., "Rare Disasters and Asset Markets in the Twentieth Century," *Quarterly Journal of Economics*, 2006, *121* (3), 823–866.

Bernard, Andrew B and J Bradford Jensen, "Exceptional exporter performance: cause, effect, or both?," *Journal of international economics*, 1999, *47* (1), 1–25.

_ and _ , "Exporting and Productivity in the USA," *Oxford Review of Economic Policy*, 2004, *20* (3), 343–357.

_ , _ , and Peter K Schott, "Survival of the Best Fit: Exposure to Low-wage Countries and the (uneven) Growth of US Manufacturing Plants," *Journal of International Economics*, 2006, *68* (1), 219–237.

— , — , and — , "Trade Costs, Firms and Productivity," *Journal of Monetary Economics*, 2006, *53* (5), 917–937.

— , — , and Robert Z Lawrence, "Exporters, jobs, and wages in US manufacturing: 1976-1987," *Brookings papers on economic activity. Microeconomics*, 1995, *1995*, 67–119.

— , — , Jonathan Eaton, and Samuel Kortum, "Plants and Productivity in International Trade," *American Economic Review*, 2003, *93* (4), 1268–1290.

— , — , Stephen J Redding, and Peter K Schott, "Firms in International Trade," *Journal of Economic Perspectives*, 2007, *21* (3), 105–130.

Bernile, Gennaro, Alok Kumar, and Johan Sulaeman, "Home away from Home: Geography of Information and Local Investors," *Review of Financial Studies*, 2015, *28* (7), 2009–2049.

Bloom, Nicholas, Mirko Draca, and John Van Reenen, "Trade Induced Technical Change? The Impact of Chinese Imports on Innovation, IT and Productivity," *NBER Working Paper*, 2011.

Bodnar, Gordon M., Bernard Dumas, and Richard C. Marston, "Pass-through and Exposure," *Journal of Finance*, 2002, *57* (1), 199–231.

Broda, Christian and David E Weinstein, "Globalization and the Gains From Variety," *Quarterly Journal of Economics*, 2006, *121* (2), 541–585.

Brown, Jeffrey, Joshua Pollet, and Scott Weisbenner, "The Investment Behavior of State Pension Plans," *NBER Working Paper*, 2009.

Bustamante, Maria Cecilia and Andres Donangelo, "Industry Concentration and Markup: Implications for Asset Pricing," *Working Paper*, 2015.

Caliendo, Lorenzo, Maximiliano Dvorkin, Fernando Parro et al., "Trade and Labor Market Dynamics," *Federal Reserve Bank of St. Louis Working Paper Series*, 2015, (2015-009).

Chaney, Thomas, "Distorted Gravity: The Intensive and Extensive Margins of International Trade," *American Economic Review*, 2008, *98* (4), 1707–1721.

Coval, Joshua D and Tobias J Moskowitz, "Home Bias at Home: Local Equity Preference in Domestic Portfolios," *Journal of Finance*, 1999, *54* (6), 2045–2073.

Das, Sanghamitra, Mark J Roberts, and James R Tybout, "Market Entry Costs, Producer Heterogeneity, and Export Dynamics," *Econometrica*, 2007, *75* (3), 837–873.

Demidova, Svetlana, "Productivity Improvements and Falling Trade Costs: Boon or Bane?," *International Economic Review*, 2008, *49* (4), 1437–1462.

di Giovanni, Julian, Andrei A. Levchenko, and Jing Zhang, "The Global Welfare Impact of China: Trade Integration and Technological Change," *American Economic Journal: Macroeconomics*, 2014, *6* (3), 153–83.

Eaton, Jonathan and Samuel Kortum, "Technology, Geography, and Trade," *Econometrica*, 2002, *70* (5), 1741–1779.

Epstein, Larry G and Stanley E Zin, "Substitution, risk aversion, and the intertemporal behavior of consumption and asset returns: A theoretical framework," *Econometrica*, 1989, *57*, 937–969.

Fama, Eugene F. and Kenneth R. French, "Size, Value, and Momentum in International Stock Returns," *Journal of Financial Economics*, 2012, *105* (3), 457–472.

_ and _ , "A Five-Factor Asset Pricing Model," *Journal of Financial Economics*, 2015, *116* (1), 1 – 22.

Feenstra, Robert C, "US imports, 1972-1994: Data and Concordances," *NBER Working Paper*, 1996.

_ and David E Weinstein, "Globalization, markups and US welfare," 2010.

Fillat, José L. and Stefania Garetto, "Risk, Returns, and Multinational Production," *Quarterly Journal of Economics*, 2015, *130* (4), 2027–2073.

Fresard, Laurent, "Financial Strength and Product Market Behavior: The Real Effects of Corporate Cash Holdings," *Journal of Finance*, 2010, *65* (3), 1097–1122.

_ and Philip Valta, "How Does Corporate Investment Respond to Increased Entry Threat?," *Working Paper*, 2014.

Gârleanu, Nicolae, Leonid Kogan, and Stavros Panageas, "Displacement risk and asset returns," *Journal of Financial Economics*, September 2012, *105* (3), 491–510.

_ , Stavros Panageas, and Jianfeng Yu, "Technological Growth and Asset Pricing," *Journal of Finance*, 2012, *67* (4), 1265–1292.

Ghironi, Fabio and Marc Melitz, "International Trade and Macroeconomics Dynamics with Heterogeneous Firms," *Quarterly Journal of Economics*, 2005, pp. 865–915.

Goldberg, Pinelopi Koujianou, Amit Kumar Khandelwal, Nina Pavcnik, and Petia Topalova, "Imported Intermediate Inputs and Domestic Product Growth: Evidence from India," *Quarterly Journal of Economics*, 2010, *125* (4), 1727–1767.

Gomes, Joao F, Leonid Kogan, and Motohiro Yogo, "Durability of Output and Expected Stock Returns," *Journal of Political Economy*, 2009, *117* (5).

Griffin, John M. and René M. Stulz, "International Competition and Exchange Rate Shocks: A Cross-Country Industry Analysis of Stock Returns," *Review of Financial Studies*, 2001, *14* (1), 215–241.

Grossman, Gene M. and James A. Levinsohn, "Import Competition and the Stock Market Return to Capital," *American Economic Review*, 1989, *79* (5), 1065–1087.

Hassan, Tarek A, "Country Size, Currency Unions, and International Asset Returns," *Journal of Finance*, 2013, *68* (6), 2269–2308.

_ , Thomas M Mertens, and Tony Zhang, "Not so disconnected: Exchange rates and the capital stock," *Journal of International Economics*, 2016, *99*, S43–S57.

Helpman, Elhanan, Marc J Melitz, and Stephen R Yeaple, "Export versus FDI with heterogeneous firms," *American Economic Review*, 2004, *94*, 300–316.

Hombert, Johan and Adrien Matray, "Can Innovation Help US Manufacturing Firms Escape Import Competition from China?," *Working Paper*, 2014.

Hou, Kewei and David T Robinson, "Industry Concentration and Average Stock Returns," *Journal of Finance*, 2006, *61* (4), 1927–1956.

Hsieh, Chang-Tai and Ralph Ossa, "A Global View of Productivity Growth in China," *Working Paper*, 2011.

Hummels, David, "Transportation Costs and International Trade in the Second Era of Globalization," *Journal of Economic Perspectives*, 2007, *21* (3), 131–154.

_ and Alexandre Skiba, "Shipping the Good Apples Out? An Empirical Confirmation of the Alchian-Allen Conjecture," *Journal of Political Economy*, 2004, *112* (6), 1384–1402.

_ , Rasmus Jørgensen, Jakob Munch, and Chong Xiang, "The Wage Effects of Offshoring: Evidence from Danish Matched Worker-Firm Data," *American Economic Review*, 2014, *104* (6), 1597–1629.

Irarrazabal, Alfonso, Andreas Moxnes, and Luca David Opromolla, "The Tip of the Iceberg: A Quantitative Framework for Estimating Trade Costs," *NBER Working Paper*, 2013.

Ivković, Zoran and Scott Weisbenner, "Local does as Local is: Information Content of the Geography of Individual Investors' Common Stock Investments," *Journal of Finance*, 2005, *60* (1), 267–306.

Kogan, Leonid, Dimitris Papanikolaou, and Noah Stoffman, "Winners and Losers: Creative Destruction and the Stock Market," *Working Paper*, 2016.

Lileeva, Alla and Daniel Trefler, "Improved Access to Foreign Markets Raises Plant-level Productivity… For Some Plants," *Quarterly Journal of Economics*, 2010, *125* (3), 1051–1099.

Loecker, Jan De, Pinelopi K Goldberg, Amit K Khandelwal, and Nina Pavcnik, "Prices, Markups and Trade Reform," *Working Paper*, 2012.

Loualiche, Erik, "Asset Pricing with Entry and Imperfect Competition," *Working Paper*, 2015.

Lustig, Hanno and Robert J. Richmond, "Gravity in FX Rsquared: Understanding the Factor Structure in Exchange Rates," 2015. Mimeo Stanford University.

_ , Nikolai Roussanov, and Adrien Verdelhan, "Common Risk Factors in Currency Markets," *Review of Financial Studies*, 2011, *24* (11), 3731–3777.

Melitz, Marc J, "The Impact of Trade on Intra-industry Reallocations and Aggregate Industry Productivity," *Econometrica*, 2003, *71* (6), 1695–1725.

_ and Daniel Trefler, "Gains from Trade when Firms Matter," *Journal of Economic Perspectives*, 2012, *26* (2), 91–118.

_ and Stephen J Redding, "Heterogeneous Firms and Trade," *Handbook of International Economics,*, 2014, *4*, 1–54.

Pastor, Lubos and Robert Stambaugh, "Liquidity risk and expected stock returns," *Journal of Political Economy*, 2003, *111* (3), 642–685.

Pavcnik, Nina, "Trade Liberalization, Exit, and Productivity Improvements: Evidence from Chilean Plants," *Review of Economic Studies*, 2002, *69* (1), 245–276.

Pierce, Justin R. and Peter K. Schott, "The Surprisingly Swift Decline of U.S. Manufacturing Employment," *NBER Working Paper*, 2012.

Rauh, Joshua D, "Investment and Financing Constraints: Evidence from the Funding of Corporate Pension Plans," *Journal of Finance*, 2006, *61* (1), 33–71.

Ready, Robert, Nikolai Roussanov, and Colin Ward, "Commodity Trade and the Carry Trade: A tale of Two Countries," *NBER Working Paper*, 2013.

Richmond, Robert J, "Trade Network Centrality and Currency Risk Premia," *Available at SSRN 2607735*, 2016.

Rietz, Thomas A., "The Equity Risk Premium a Solution," *Journal of Monetary Economics*, 1988, *22* (1), 117 – 131.

Tian, Mary, "Tradability of Output, Business Cycles, and Asset Prices," *Working Paper*, 2011.

Trefler, Daniel, "The Long and Short of the Canada-US Free Trade Agreement," *American Economic Review*, 2004, *94* (4), 870–895.

Valta, Philip, "Competition and the Cost of Debt," *Journal of Financial Economics*, 2012, *105* (3), 661–682.

Verdelhan, Adrien, "The Share of Systematic Variation in Bilateral Exchange Rates," *Journal of Finance*, Forthcoming.

Xu, Jin, "Profitability and Capital Structure: Evidence from Import Penetration," *Journal of Financial Economics*, 2012, *106* (2), 427–446.

Zhu, Xiaodong, "Understanding China's growth: Past, present, and future," *The Journal of Economic Perspectives*, 2012, *26* (4), 103–124.

Table 1
Summary statistics

This table presents summary statistics for the industry-year sample that covers 439 unique manufacturing industries (with 4-digit SIC codes between 2000 and 3999). Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. Tariffs are measured at the industry-year level as the ratio of customs duties to the Free-on-Board value of imports. Imports, Exports and Net Imports are measured at the industry-year level and normalized by the sum of total shipments and imports. Shipping costs, weight-to-value ratio, tariffs, imports, exports are available from the Census and obtained from Peter Schott's website. Employment, shipments, value added, and total factor productivity (TFP) are obtained from the NBER-CES files, and are available until 2011. All variables are windsorized at the first and ninety-ninth percentiles. The sample period is 1974-2011.

	Obs.	Mean	SD	p1	p50	p99
Trade Data						
Shipping costs	14366	0.056	0.038	0.002	0.047	0.224
Log Weight-to-value	8705	-1.750	1.519	-6.106	-1.742	2.154
Tariffs	14366	0.043	0.051	0.000	0.027	0.261
Imports	14366	0.169	0.192	0.000	0.099	0.887
Exports	14366	0.106	0.117	0.000	0.067	0.619
Net Imports	14366	0.062	0.196	-0.416	0.013	0.803
Industry Controls						
Log employment	14366	2.979	1.115	0.000	2.970	5.615
Log value added	14366	7.261	1.293	4.182	7.272	10.397
Log shipments	14366	7.997	1.295	4.944	8.029	11.204
TFP	14366	1.001	0.169	0.617	0.990	1.695

Table 2
Shipping cost persistence

This table presents transition frequencies across shipping cost quintiles (respectively weight-to-value quintiles) from year $t-1$ to t (Columns 1 to 6) and from year $t-5$ to t (Columns 7 to 12) in the sample over the period 1974-2014 (respectively 1989-2014). Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports.

Panel A: Transition across shipping cost quintiles

	from year $t-1$ to year t						from year $t-5$ to year t				
	Q1 (t)	Q2 (t)	Q3 (t)	Q4 (t)	Q5 (t)		Q1 (t)	Q2 (t)	Q3 (t)	Q4 (t)	Q5 (t)
Q1 (t-1)	0.866	0.113	0.013	0.003	0.0061	Q1 (t-5)	0.761	0.163	0.044	0.018	0.014
Q2 (t-1)	0.113	0.734	0.137	0.014	0.002	Q2 (t-5)	0.153	0.572	0.213	0.047	0.015
Q3 (t-1)	0.010	0.138	0.685	0.158	0.010	Q3 (t-5)	0.039	0.206	0.494	0.224	0.036
Q4 (t-1)	0.004	0.012	0.154	0.709	0.121	Q4 (t-5)	0.013	0.048	0.206	0.549	0.183
Q5 (t-1)	0.003	0.005	0.014	0.120	0.857	Q5 (t-5)	0.015	0.018	0.054	0.183	0.730

Panel B: Transition across weight-to-value quintiles

	from year $t-1$ to year t						from year $t-5$ to year t				
	Q1 (t)	Q2 (t)	Q3 (t)	Q4 (t)	Q5 (t)		Q1 (t)	Q2 (t)	Q3 (t)	Q4 (t)	Q5 (t)
Q1 (t-1)	0.946	0.047	0.003	0.001	0.002	Q1 (t-5)	0.896	0.095	0.004	0.002	0.003
Q2 (t-1)	0.047	0.882	0.065	0.005	0.000	Q2 (t-5)	0.092	0.785	0.112	0.011	0.000
Q3 (t-1)	0.002	0.068	0.863	0.066	0.001	Q3 (t-5)	0.005	0.112	0.749	0.132	0.002
Q4 (t-1)	0.002	0.003	0.066	0.884	0.046	Q4 (t-5)	0.003	0.010	0.127	0.773	0.087
Q5 (t-1)	0.002	0.001	0.002	0.045	0.951	Q5 (t-5)	0.002	0.002	0.004	0.085	0.908

Table 3
Shipping costs and trade flows

This table presents the result of industry-year regressions of the value of trade flows on shipping costs (Panel A) and the weight-to-value ratio (Panel B). We consider successively imports (Columns 1 to 3), exports (Columns 4 to 6) and imports net of exports (Columns 7 to 9) normalized by the total value of shipments plus imports. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. Tariffs are measured at the industry-year level as the ratio of customs duties to the Free-on-Board value of imports. Some regressions include control for the industry level of tariffs, penetration, log employment, log value added, log shipments and total factor productivity (TFP), all obtained from the NBER-CES datasets. Standard errors are clustered at the industry level and reported in parentheses. *, ** and *** means statistically different from zero at 10%, 5% and 1% level of significance. The sample period is 1974-2011 in Panel A, and 1989-2011 in Panel B.

	Panel A: Shipping costs								
	Imports			Exports			Net imports		
Shipping costs	-0.327*	-0.614***	-0.096	-0.690***	-0.707***	-0.030	0.369*	0.099	-0.059
	(0.168)	(0.160)	(0.091)	(0.119)	(0.106)	(0.096)	(0.198)	(0.169)	(0.119)
Tariffs		0.643***	-0.556***		-0.242***	-0.126		0.877***	-0.431***
		(0.137)	(0.141)		(0.055)	(0.078)		(0.139)	(0.147)
Log employment		0.031***	-0.067***		-0.031***	-0.028*		0.061***	-0.040*
		(0.012)	(0.016)		(0.010)	(0.015)		(0.013)	(0.021)
Log value added		-0.042*	-0.054***		0.023	-0.009		-0.064***	-0.045*
		(0.023)	(0.020)		(0.015)	(0.018)		(0.022)	(0.026)
Log shipments		-0.038*	-0.009		-0.003	0.008		-0.034	-0.013
		(0.022)	(0.022)		(0.013)	(0.018)		(0.022)	(0.027)
TFP		0.021	-0.006		0.011	-0.029		0.008	0.017
		(0.037)	(0.020)		(0.025)	(0.018)		(0.034)	(0.024)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	Yes	No	No	Yes	No	No	Yes
Observations	14366	14366	14366	14366	14366	14366	14366	14366	14366
R^2	0.143	0.327	0.861	0.129	0.163	0.741	0.049	0.262	0.783

	Panel B: Weight-to-value ratio								
	Imports			Exports			Net imports		
Log Weight-to-value	-0.040***	-0.037***	-0.003	-0.025***	-0.032***	0.006	-0.015**	-0.005	-0.009
	(0.006)	(0.006)	(0.007)	(0.004)	(0.004)	(0.005)	(0.007)	(0.006)	(0.008)
Tariffs		1.284***	-0.196		-0.755***	-0.256**		2.016***	0.073
		(0.273)	(0.157)		(0.104)	(0.102)		(0.274)	(0.201)
Log employment		0.014	-0.056***		-0.043***	-0.007		0.056***	-0.049**
		(0.016)	(0.016)		(0.010)	(0.015)		(0.016)	(0.024)
Log value added		-0.038	-0.016		0.007	-0.005		-0.044	-0.011
		(0.031)	(0.018)		(0.016)	(0.019)		(0.030)	(0.029)
Log shipments		-0.037	-0.051**		0.017	-0.014		-0.053*	-0.033
		(0.033)	(0.021)		(0.015)	(0.023)		(0.031)	(0.035)
TFP		0.056	-0.028		0.009	-0.025		0.044	-0.008
		(0.041)	(0.020)		(0.027)	(0.020)		(0.039)	(0.029)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	Yes	No	No	Yes	No	No	Yes
Observations	8705	8705	8705	8705	8705	8705	8705	8705	8705
R^2	0.132	0.383	0.934	0.105	0.187	0.828	0.031	0.333	0.871

Table 4
Shipping cost and weight-to-value portfolios - Summary statistics

This table reports summary statistics for five shipping costs portfolios (Panel A), and five weight-to-value portfolios (Panel B) based on U.S. stocks traded on the Amex, Nasdaq, or NYSE. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. ME is the average portfolio market capitalization over the sample period converted into 2013 constant billions dollars. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO× item PRCC_F). Return on assets (ROA) is defined as operating income after depreciation and amortization (item OIBDP-itemDP) divided by total assets. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT). Market leverage is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity. The sample period is 1975-2015 in Panel A, and 1990-2015 in Panel B.

	Panel A: Shipping cost portfolios					
	Low	2	3	4	High	Hi-Lo
Portfolio Characteristics						
ME	4.494	3.185	2.889	3.781	4.184	
BE/ME	0.589	0.659	0.697	0.805	0.939	
Market leverage	0.150	0.155	0.177	0.228	0.299	
ROA	-0.064	0.026	0.040	0.081	0.096	
I/K	0.311	0.320	0.295	0.247	0.200	
Portfolio Moments						
Mean excess return (%)	16.053	9.763	9.150	10.081	9.065	-6.988
Sharpe ratio	0.562	0.386	0.390	0.465	0.466	-0.350

	Panel B: Weight-to-value portfolios					
	Low	2	3	4	High	Hi-Lo
Portfolio Characteristics						
ME	5.341	4.035	2.777	3.346	6.084	
BE/ME	0.427	0.491	0.538	0.604	0.732	
Market leverage	0.096	0.093	0.113	0.194	0.279	
ROA	-0.151	-0.028	0.006	0.063	0.088	
I/K	0.336	0.337	0.321	0.255	0.179	
Portfolio Moments						
Mean excess return (%)	16.600	11.139	9.581	7.659	7.981	-8.618
Sharpe ratio	0.538	0.406	0.375	0.368	0.404	-0.360

Table 5
Shipping cost and weight-to-value portfolios - Returns

This table presents excess returns (α) over a five-factor Fama-French model of either shipping costs portfolios (Panel A) or weight-to-value portfolios (Panel B). Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. In any given month, stocks are sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year. We regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), the value factor (high minus low), the profitability factor (robust minus weak), and the investment factor (conservative minus aggressive) all obtained from Kenneth French's website. Portfolios returns are either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12). Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Panel A, and 1990-2015 in Panel B.

Panel A: Shipping costs portfolios

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	9.702***	1.245	1.074	-1.103	-4.005***	-13.707***	4.244***	0.592	0.658	-0.067	-0.954	-5.198**
	(2.359)	(1.695)	(1.646)	(1.524)	(1.379)	(3.019)	(1.536)	(1.610)	(1.695)	(1.546)	(1.247)	(2.073)
β^{MKT}	1.064***	1.043***	1.018***	1.128***	1.091***	0.027	0.990***	1.022***	1.053***	1.089***	0.936***	-0.054
	(0.033)	(0.026)	(0.026)	(0.032)	(0.034)	(0.056)	(0.046)	(0.038)	(0.028)	(0.026)	(0.026)	(0.048)
β^{HML}	-0.620***	-0.305***	-0.204***	0.263***	0.503***	1.123***	-0.536***	-0.268***	-0.068	-0.071	0.161*	0.697***
	(0.074)	(0.061)	(0.070)	(0.092)	(0.096)	(0.125)	(0.052)	(0.075)	(0.084)	(0.063)	(0.091)	(0.109)
β^{SMB}	0.950***	1.039***	0.884***	0.789***	0.730***	-0.220***	-0.111**	0.159**	0.052	0.104	0.013	0.124*
	(0.061)	(0.057)	(0.063)	(0.061)	(0.053)	(0.079)	(0.049)	(0.064)	(0.072)	(0.065)	(0.049)	(0.072)
β^{RMW}	-0.821***	-0.445***	-0.479***	-0.149	0.211**	1.033***	-0.013	-0.139	-0.468***	-0.060	0.306***	0.319***
	(0.109)	(0.068)	(0.084)	(0.104)	(0.089)	(0.150)	(0.072)	(0.091)	(0.113)	(0.081)	(0.064)	(0.094)
β^{CMA}	0.153	0.010	0.015	-0.080	-0.040	-0.193	0.145	-0.036	-0.167	0.146	0.298***	0.153
	(0.159)	(0.108)	(0.128)	(0.167)	(0.115)	(0.216)	(0.162)	(0.170)	(0.116)	(0.102)	(0.111)	(0.198)

Panel B: Weight-to-value portfolios

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	11.320***	4.743*	2.756	-1.862	-3.238*	-14.558***	4.414**	5.670***	1.277	-2.633	0.154	-4.260
	(3.559)	(2.793)	(2.385)	(1.993)	(1.713)	(4.238)	(1.967)	(2.074)	(1.795)	(1.637)	(1.455)	(2.845)
β^{MKT}	1.060***	1.034***	1.063***	1.092***	1.121***	0.062	0.902***	1.074***	1.127***	1.060***	0.856***	-0.046
	(0.046)	(0.037)	(0.039)	(0.039)	(0.048)	(0.077)	(0.060)	(0.050)	(0.046)	(0.031)	(0.030)	(0.076)
β^{HML}	-0.626***	-0.350***	-0.208**	0.349***	0.642***	1.268***	-0.447***	-0.483***	-0.412***	0.223***	0.264**	0.711***
	(0.098)	(0.082)	(0.092)	(0.100)	(0.084)	(0.118)	(0.069)	(0.089)	(0.062)	(0.086)	(0.118)	(0.170)
β^{SMB}	0.948***	1.014***	0.868***	0.731***	0.657***	-0.291***	-0.130	0.142	0.154**	0.171***	-0.049	0.081
	(0.098)	(0.090)	(0.087)	(0.074)	(0.051)	(0.110)	(0.090)	(0.089)	(0.064)	(0.042)	(0.060)	(0.129)
β^{RMW}	-0.898***	-0.552***	-0.524***	-0.096	0.127**	1.025***	-0.014	-0.317***	-0.295*	0.208***	0.115*	0.129
	(0.162)	(0.084)	(0.105)	(0.092)	(0.062)	(0.199)	(0.116)	(0.074)	(0.155)	(0.061)	(0.063)	(0.160)
β^{CMA}	0.248	-0.064	-0.027	-0.104	-0.078	-0.326	0.235	-0.324***	-0.007	0.111	0.130	-0.105
	(0.187)	(0.127)	(0.180)	(0.179)	(0.122)	(0.262)	(0.173)	(0.103)	(0.152)	(0.079)	(0.130)	(0.262)

Table 6
Shipping costs and weight-to-value portfolios - Evidence from European stock markets

This table presents excess returns (α) over a five-factor Fama-French model of either shipping costs portfolios (Panel A) or weight-to-value portfolios (Panel B). Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. In any given month, stocks traded on European stock markets are sorted into respectively five shipping costs and five weight-to-value portfolios based on the same sorting of 4-digit SIC codes industries used in Table 5. Monthly returns and 4-digit SIC codes are both obtained from the EUROFIDAI database. As in Fama and French (2012), monthly returns are in U.S. dollars and monthly excess returns are returns in excess of the one-month U.S. Treasury bill rate. We include all stocks (2,601 unique stocks in manufacturing industries for which data on shipping costs is available) traded in the following 16 European countries: Austria, Belgium, Switzerland, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Ireland, Italy, The Netherlands, Norway, Portugal and Sweden. This list of European countries is the one studied in Fama and French (2012) and used to compute the five factors for Europe (the market portfolio minus the risk-free rate, the size factor, the value factor, the profitability factor, and the investment factor), all available on Kenneth French's website from July 1990. Portfolios returns are either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12). Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1990-2015.

Panel A: Shipping cost portfolios

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	8.645***	1.741	1.885	-1.019	-1.598	-10.243***	8.462***	3.500	0.771	-2.564	-2.020	-10.482***
	(2.814)	(2.684)	(2.011)	(1.482)	(1.103)	(3.060)	(2.512)	(3.389)	(3.394)	(2.802)	(1.460)	(3.183)
β^{MKT}	0.975***	1.107***	0.999***	1.036***	0.972***	-0.003	0.799***	1.108***	1.081***	1.038***	1.035***	0.235***
	(0.047)	(0.037)	(0.041)	(0.027)	(0.021)	(0.051)	(0.054)	(0.075)	(0.058)	(0.036)	(0.039)	(0.074)
β^{HML}	-0.393***	0.034	-0.176	0.185**	0.334***	0.727***	-0.600***	0.063	0.098	0.095	0.123	0.723***
	(0.117)	(0.126)	(0.116)	(0.091)	(0.055)	(0.136)	(0.154)	(0.240)	(0.206)	(0.081)	(0.104)	(0.149)
β^{SMB}	0.699***	0.779***	0.763***	0.826***	0.755***	0.056	-0.338**	0.053	0.119	0.170**	0.213***	0.552***
	(0.072)	(0.061)	(0.067)	(0.044)	(0.033)	(0.067)	(0.148)	(0.145)	(0.137)	(0.077)	(0.076)	(0.171)
β^{RMW}	-0.765***	-0.337**	-0.479***	-0.102	0.012	0.778***	-0.233	-0.448*	-0.170	0.494***	0.341***	0.574***
	(0.151)	(0.153)	(0.170)	(0.094)	(0.049)	(0.160)	(0.195)	(0.257)	(0.225)	(0.181)	(0.118)	(0.212)
β^{CMA}	-0.302*	-0.213	-0.174	-0.106	-0.089	0.213	-0.004	-0.478*	-0.507***	0.094	0.214	0.218
	(0.157)	(0.131)	(0.127)	(0.083)	(0.071)	(0.175)	(0.247)	(0.249)	(0.147)	(0.098)	(0.180)	(0.271)

Panel B: Weight-to-value portfolios

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	9.432***	4.543*	0.571	0.603	-2.200**	-11.631***	5.576*	15.005***	2.924	-0.333	-3.365**	-8.941**
	(2.992)	(2.545)	(2.006)	(1.503)	(1.083)	(3.302)	(3.038)	(3.754)	(2.460)	(2.575)	(1.511)	(3.776)
β^{MKT}	0.990***	1.073***	1.012***	1.024***	0.969***	-0.021	0.749***	1.077***	1.110***	1.104***	1.021***	0.272***
	(0.050)	(0.034)	(0.043)	(0.026)	(0.017)	(0.052)	(0.050)	(0.062)	(0.063)	(0.058)	(0.038)	(0.070)
β^{HML}	-0.347***	-0.229**	-0.156	0.171***	0.370***	0.717***	-0.277***	-0.728***	-0.425***	0.541***	0.142	0.419***
	(0.118)	(0.112)	(0.113)	(0.065)	(0.061)	(0.138)	(0.093)	(0.211)	(0.143)	(0.123)	(0.093)	(0.115)
β^{SMB}	0.701***	0.713***	0.833***	0.796***	0.751***	0.049	-0.195**	-0.383**	0.150	0.093	0.182***	0.378***
	(0.080)	(0.076)	(0.065)	(0.050)	(0.028)	(0.075)	(0.080)	(0.173)	(0.097)	(0.106)	(0.069)	(0.108)
β^{RMW}	-0.752***	-0.515***	-0.436***	-0.113*	0.026	0.779***	-0.118	-0.729**	-0.589***	0.378**	0.428***	0.546***
	(0.159)	(0.156)	(0.149)	(0.064)	(0.057)	(0.152)	(0.171)	(0.323)	(0.197)	(0.147)	(0.125)	(0.182)
β^{CMA}	-0.169	-0.411***	-0.208	-0.061	-0.107	0.062	0.465***	-0.742**	-0.204	-0.499***	0.256	-0.209
	(0.161)	(0.119)	(0.151)	(0.061)	(0.073)	(0.186)	(0.117)	(0.295)	(0.191)	(0.131)	(0.163)	(0.158)

Table 7
Shipping cost and weight-to-value portfolios - Returns around earnings announcements

This table presents the returns around earnings announcements of stocks sorted into either shipping costs portfolios (Panel A) or weight-to-value portfolios (Panel B). The table reports both cumulative excess returns (stock return minus the risk-free rate) over a 7-day window (respectively 11-day window) from 1 day prior to the quarterly earnings announcement day to 1 day (respectively 5 days) after the announcement day, which we refer to as the (-5,1) window (respectively (-5,5) window). These announcement returns are then either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12) for each calendar quarter at the level of the shipping costs and weight-to-value portfolios. When value-weighted, we weight each return by the stock market capitalization measured at the end of the calendar quarter prior to the earnings announcement. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. Standard errors are based on the time series of quarterly returns, and estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Panel A, and 1990-2015 in Panel B.

Panel A: Shipping costs portfolios

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Announcement Ret. (-5,1)	0.264	0.337**	0.443***	0.484***	0.431***	0.167	0.357*	0.334	0.466**	0.370*	0.502***	0.146
	(0.207)	(0.164)	(0.133)	(0.128)	(0.116)	(0.195)	(0.187)	(0.217)	(0.185)	(0.189)	(0.100)	(0.193)
Announcement Ret. (-5,5)	0.615**	0.528**	0.763***	0.747***	0.647***	0.032	0.530**	0.288	0.688***	0.604**	0.521***	-0.009
	(0.304)	(0.225)	(0.210)	(0.189)	(0.180)	(0.271)	(0.266)	(0.264)	(0.253)	(0.263)	(0.187)	(0.248)

Panel B: Weight-to-value portfolios

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Announcement Ret. (-5,1)	0.406	0.564***	0.567***	0.599***	0.591***	0.185	0.563***	0.724***	1.163***	0.590***	0.401***	-0.162
	(0.279)	(0.192)	(0.181)	(0.135)	(0.158)	(0.298)	(0.145)	(0.183)	(0.182)	(0.189)	(0.103)	(0.148)
Announcement Ret. (-5,5)	0.818**	0.827***	0.935***	0.847***	0.870***	0.052	0.819***	0.796***	1.130***	0.786***	0.653***	-0.165
	(0.406)	(0.282)	(0.283)	(0.204)	(0.243)	(0.446)	(0.223)	(0.261)	(0.392)	(0.233)	(0.211)	(0.270)

Table 8
Analysts' forecast errors

This table reports the coefficients from panel regressions of either the actual I/B/E/S annual earnings per share (EPS) (columns 1, 4, 7 and 10), the mean I/B/E/S consensus forecast of annual EPS (columns 2, 5, 8 and 11), or the forecast error (actual I/B/E/S annual EPS minus mean I/B/E/S consensus forecast of annual EPS; columns 3, 6, 9 and 12), all normalized by the stock price at the end of the last fiscal year, on either shipping costs or the logarithm of the weight-to-value ratio, and control variables. The consensus forecast is measured as the average of the last forecast of each analyst covering the stock in the 8 months before the end of the fiscal year. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. BETA for a stock in a given month is the beta of the stock monthly returns with the US stock market return estimated using monthly data over the past 60 months. LN(ME) is the logarithm of firm market capitalization in the previous month. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO× item PRCC_F) at the end of fiscal year t-2. Return on assets (ROA) is defined as operating income after depreciation and amortization (item OIBDP-itemDP) divided by total assets at the end of fiscal year t-2. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT) at the end of fiscal year t-2. MARKET LEV is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity at the end of fiscal year t-2. We remove observations for which the the forecast error is below the 1st and above the 99th percentiles of its empirical distribution. Standard errors are clustered at the 4-digit industry level. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1982-2015.

	Actual	Forecast	Error	Actual	Forecast	Error	Actual	Forecast	Error	Actual	Forecast	Error
SC	0.671***	0.658***	0.013	0.329*	0.323	0.006						
	(0.242)	(0.245)	(0.014)	(0.198)	(0.196)	(0.010)						
Log Weight-to-value							0.016***	0.016***	-0.000	0.011**	0.011**	-0.000
							(0.005)	(0.005)	(0.000)	(0.005)	(0.005)	(0.000)
BETA				-0.018***	-0.016***	-0.001**				-0.016***	-0.015***	-0.001
				(0.003)	(0.003)	(0.001)				(0.004)	(0.004)	(0.001)
LN(ME)				0.020***	0.018***	0.002***				0.021***	0.018***	0.002***
				(0.003)	(0.003)	(0.000)				(0.003)	(0.003)	(0.000)
BEME				0.008	0.009	-0.001				0.012	0.013	-0.001
				(0.010)	(0.010)	(0.001)				(0.009)	(0.009)	(0.001)
MARKET LEV				0.017	0.026*	-0.008***				-0.008	-0.001	-0.007***
				(0.014)	(0.013)	(0.002)				(0.015)	(0.015)	(0.002)
I/K				-0.048***	-0.045***	-0.003**				-0.035***	-0.033***	-0.002**
				(0.009)	(0.009)	(0.001)				(0.011)	(0.011)	(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22915	22915	22915	22915	22915	22915	20376	20376	20376	20376	20376	20376
R^2	0.031	0.037	0.021	0.081	0.082	0.044	0.045	0.050	0.016	0.089	0.088	0.037

Table 9
Shipping cost and weight-to-value portfolios - Returns, conditional on size and profitability

This table presents excess returns (α) over a five-factor Fama-French model of either shipping costs portfolios (Panel A) or weight-to-value portfolios (Panel B). Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. In any given month, stocks are independently sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year, and into three portfolios based on either their market capitalization (Size) in the previous month or based on their return on assets (ROA) in year t-2. Stocks at the intersection of the two sorts are grouped together to form portfolios based on shipping costs and either Size or ROA (Panel A), and based on weight-to-value and either Size or ROA (Panel B). We then regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), the value factor (high minus low), the profitability factor (robust minus weak), and the investment factor (conservative minus aggressive) all obtained from Kenneth French's website. Portfolios returns are either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12). Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Panel A, and 1990-2015 in Panel B.

Panel A: Shipping cost portfolios

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
	Size terciles						Size terciles					
T1	12.033***	0.594	2.002	-1.079	-6.402***	-18.436***	10.924***	0.505	2.662	-0.749	-6.864***	-17.788***
	(3.498)	(2.568)	(2.370)	(2.391)	(2.049)	(3.723)	(3.136)	(2.601)	(2.311)	(2.322)	(1.884)	(3.561)
T2	9.534***	2.105	-0.323	-1.584	-3.730**	-13.265***	9.555***	2.029	-0.193	-1.146	-4.067**	-13.621***
	(2.605)	(2.131)	(1.832)	(1.518)	(1.537)	(3.421)	(2.573)	(2.090)	(1.812)	(1.492)	(1.602)	(3.485)
T3	9.005***	1.393	1.800	-0.978	-3.329***	-12.333***	4.176***	0.772	0.801	0.072	-0.905	-5.081**
	(2.129)	(1.454)	(1.665)	(1.473)	(1.223)	(2.754)	(1.557)	(1.682)	(1.746)	(1.586)	(1.285)	(2.086)
T1-T3						6.102						12.707***
						(3.248)						(3.189)
	ROA terciles						ROA terciles					
T1	10.187***	-0.415	0.199	-0.664	-6.418***	-16.605***	10.579***	-0.159	4.734	1.920	-6.675***	-17.253***
	(3.166)	(2.471)	(2.288)	(2.691)	(2.291)	(3.857)	(2.790)	(2.359)	(2.874)	(3.062)	(2.106)	(3.878)
T2	10.991***	2.328	1.696	-0.135	-2.573*	-13.563***	8.082***	-2.410	-4.087**	-1.851	-0.725	-8.808***
	(2.256)	(1.512)	(1.673)	(1.447)	(1.480)	(3.039)	(2.046)	(2.038)	(2.069)	(1.991)	(1.557)	(2.782)
T3	6.997***	2.938*	2.421	-0.986	-1.643	-8.640***	2.766	3.019	1.596	0.869	-0.682	-3.448
	(1.789)	(1.565)	(1.679)	(1.330)	(1.330)	(2.339)	(2.008)	(2.586)	(2.264)	(1.682)	(1.658)	(2.522)
T1-T3						7.965**						13.806***
						(3.017)						(4.046)

Panel B: Weight-to-value portfolios

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
	Size terciles						Size terciles					
T1	16.468***	5.578	4.736	-0.388	-5.445**	-21.913***	15.101***	6.576*	4.299	-0.536	-5.754**	-20.856***
	(5.708)	(3.718)	(3.884)	(3.155)	(2.753)	(5.941)	(5.234)	(3.764)	(3.686)	(3.205)	(2.531)	(5.847)
T2	9.786**	4.943	1.066	-2.745	-3.670**	-13.456***	10.384***	4.588	1.770	-3.586*	-4.275**	-14.659***
	(3.944)	(3.391)	(2.622)	(1.843)	(1.821)	(4.501)	(3.861)	(3.297)	(2.401)	(1.831)	(1.800)	(4.452)
T3	9.643***	4.609**	2.503	-2.920	-2.289	-11.932***	4.478**	6.120***	1.372	-2.524	0.320	-4.158
	(2.677)	(2.108)	(1.917)	(1.785)	(1.655)	(3.445)	(2.040)	(2.144)	(1.872)	(1.685)	(1.496)	(2.909)
T1-T3						9.981*						16.698**
						(4.827)						(5.854)
	ROA terciles						ROA terciles					
T1	12.430***	4.329	2.512	-2.109	-6.097**	-18.527***	8.722***	2.963	6.545*	-0.736	-5.235	-13.957***
	(4.656)	(4.058)	(3.795)	(3.312)	(2.952)	(5.372)	(3.314)	(3.930)	(3.602)	(3.700)	(3.190)	(4.660)
T2	13.395***	7.056***	3.196	-0.761	-2.437	-15.831***	11.132***	0.644	1.518	-6.911***	0.766	-10.366**
	(2.941)	(2.106)	(2.015)	(1.926)	(1.892)	(3.980)	(3.207)	(2.902)	(2.472)	(2.663)	(1.964)	(4.254)
T3	6.523**	5.271**	4.164*	-1.698	-1.723	-8.246***	2.440	7.745***	1.671	-1.406	-1.127	-3.567
	(2.616)	(2.301)	(2.300)	(1.725)	(1.434)	(3.145)	(2.260)	(2.688)	(2.194)	(1.857)	(1.932)	(3.562)
T1-T3						10.281**						10.390*
						(3.867)						(5.068)

Table 10
Chinese import growth betas - Conditional on size and profitability

This table presents Chinese import growth betas of each shipping costs portfolios (Columns 1 to 6) and weight-to-value portfolios (Columns 7 to 12). Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. In any given month, stocks are independently sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year, and into three portfolios based on either their market capitalization (Size) in the previous month or based on their return on assets (ROA) in year t-2. Stocks at the intersection of the two sorts are grouped together to form portfolios based on shipping costs and either Size or ROA (Columns 1 to 6), and based on weight-to-value and either Size or ROA (Columns 7 to 12). We then compute Chinese import growth betas separately for each (double-sorted) portfolio as the coefficient β of the following OLS regression estimated at the monthly frequency over the sample period: $R^{EW}_{J,t} = \beta_J \cdot \text{ChImpGr}_t + \alpha_J + u_{J,t}$, where $R^{EW}_{J,t}$ is the equally-weighted portfolio excess return in month t and ChImpGr_t is the growth rate of Chinese imports to the U.S. between month t and the same month in the previous year. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1974-2015 in Columns 1 to 6, and 1989-2015 in Columns 7 to 12.

	Chinese (Univariate) Import Growth Betas											
	Shipping cost portfolios						Weight-to-value portfolios					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
All	-0.629*	-0.404	-0.329	-0.262	-0.162	0.406*	-0.737*	-0.324	-0.432	-0.238	-0.191	0.487
	(0.334)	(0.297)	(0.278)	(0.253)	(0.213)	(0.231)	(0.436)	(0.400)	(0.375)	(0.297)	(0.271)	(0.319)
	Size terciles						Size terciles					
T1	-0.742*	-0.642*	-0.504*	-0.353	-0.255	0.407	-0.961*	-0.573	-0.543	-0.317	-0.281	0.591
	(0.391)	(0.330)	(0.302)	(0.274)	(0.248)	(0.272)	(0.524)	(0.430)	(0.402)	(0.335)	(0.314)	(0.393)
T2	-0.607*	-0.373	-0.270	-0.237	-0.345	0.256	-0.697	-0.226	-0.513	-0.230	-0.262	0.401
	(0.361)	(0.325)	(0.300)	(0.272)	(0.240)	(0.261)	(0.462)	(0.436)	(0.406)	(0.327)	(0.307)	(0.354)
T3	-0.425	-0.183	-0.205	-0.206	-0.057	0.356	-0.387	-0.165	-0.242	-0.177	-0.094	0.251
	(0.286)	(0.280)	(0.268)	(0.243)	(0.204)	(0.218)	(0.374)	(0.370)	(0.372)	(0.277)	(0.252)	(0.291)
	ROA terciles						ROA terciles					
T1	-0.717*	-0.569	-0.500	-0.186	-0.140	0.548*	-0.893*	-0.483	-0.677	-0.186	-0.016	0.789**
	(0.390)	(0.354)	(0.330)	(0.328)	(0.278)	(0.285)	(0.501)	(0.484)	(0.442)	(0.406)	(0.351)	(0.382)
T2	-0.497*	-0.223	-0.201	-0.253	-0.191	0.283	-0.469	-0.020	-0.305	-0.251	-0.185	0.156
	(0.300)	(0.266)	(0.245)	(0.248)	(0.215)	(0.220)	(0.395)	(0.342)	(0.347)	(0.306)	(0.274)	(0.316)
T3	-0.484*	-0.345	-0.378	-0.293	-0.151	0.354*	-0.554*	-0.297	-0.404	-0.249	-0.189	0.346
	(0.253)	(0.259)	(0.241)	(0.226)	(0.197)	(0.181)	(0.329)	(0.344)	(0.327)	(0.261)	(0.240)	(0.230)

Table 11
Shipping cost portfolios - Returns, conditional on US trade elasticities (σ)

This table presents equally-weighted excess returns (α) over a five-factor Fama-French model of shipping costs portfolios. Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. The sample is restricted to small firms, defined as those with market capitalization (Size) below the sample median in the previous month in Panel A; and to low return on assets (ROA) firms, defined as those with ROA below the median in year t-2 in Panel B. In any given month, stocks are independently sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year, and into two portfolios based on their industry US trade elasticities (σ). US trade elasticities are estimated by Broda and Weinstein (2006) from 1990 to 2001 at the commodity level, and aggregated at the four-digit SIC based on total imports over 1990-2001. Stocks at the intersection of the two sorts are grouped together to form portfolios based on either shipping costs (Panel A), or weight-to-value (Panel B) and US trade elasticities. We then regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), and the value factor (high minus low), all obtained from Kenneth French's website. Portfolios returns are either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12). Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Columns 1 to 6, and 1990-2015 in Columns 7 to 12.

	Panel A: Small Size only											
	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Low σ industries	1.843	2.730	3.056	-1.770	-4.607**	-6.450*	1.586	2.732	2.798	-1.789	-3.746**	-5.333
	(3.017)	(3.332)	(2.139)	(2.236)	(1.939)	(3.576)	(2.820)	(3.280)	(2.138)	(2.219)	(1.815)	(3.420)
High σ industries	14.155***	1.494	1.935	1.047	-5.403*	-19.558***	12.662***	1.222	3.015	1.408	-5.227*	-17.889***
	(3.948)	(2.693)	(2.454)	(2.699)	(2.820)	(4.753)	(3.555)	(2.591)	(2.555)	(2.449)	(2.671)	(4.834)
High σ - Low σ						-13.107***						-12.556**
						(4.966)						(5.020)
	Panel B: Low ROA only											
	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Low σ industries	1.664	-0.012	3.075	-2.705	-4.719**	-6.383*	4.689	0.023	4.553**	-4.750	-0.707	-5.396
	(2.796)	(3.471)	(2.118)	(2.509)	(1.858)	(3.353)	(3.458)	(3.485)	(1.927)	(3.026)	(1.817)	(3.980)
High σ industries	12.028***	2.248	0.242	3.075	-5.724**	-17.752***	8.855***	1.023	-4.048	4.420	-7.263**	-16.118***
	(3.532)	(2.257)	(2.195)	(2.508)	(2.838)	(4.840)	(2.114)	(2.349)	(2.844)	(2.946)	(3.472)	(4.426)
High σ - Low σ						-11.369**						-10.722*
						(4.883)						(5.548)

Table 12
Shipping cost portfolios - Returns, conditional on Pareto parameter (γ)

This table presents equally-weighted excess returns (α) over a five-factor Fama-French model of either shipping costs portfolios (Panel A) or weight-to-value portfolios (Panel B). Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. The sample is restricted to small firms, defined as those with market capitalization (Size) below the sample median in the previous month in Panel A; and to low return on assets (ROA) firms, defined as those with ROA below the median in year t-2 in Panel B. In any given month, stocks are independently sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year, and into two portfolios based on their industry Pareto tail parameter (γ) in the previous year. We estimate the Pareto parameter separately for each industry-year as the estimated coefficient γ of the following OLS regression: $ln(SIZE) = -\gamma ln(Rank) + constant$, where for each year and 4-digit industries, firms are ranked in descending order according to their total firm market value (Compustat item CSHO $\times$ PRCC_F+AT-CEQ). Stocks at the intersection of the two sorts are grouped together to form portfolios based on either shipping costs (Columns 1 to 6), or weight-to-value (Columns 7 to 12) and the Pareto tail parameter. We then regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), and the value factor (high minus low), all obtained from Kenneth French's website. Portfolios returns are either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12). Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Columns 1 to 6, and 1990-2015 in Columns 7 to 12.

Panel A: Small Size only

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Low γ industries	8.864***	-1.216	2.316	-2.911	-4.227*	-13.091***	8.451***	0.257	2.582	-1.955	-2.399	-10.850***
	(2.973)	(2.579)	(2.978)	(2.281)	(2.215)	(3.846)	(2.780)	(2.602)	(2.967)	(2.188)	(2.055)	(3.699)
High γ industries	16.326***	2.266	1.364	-0.313	-5.217***	-21.542***	15.709***	2.380	1.485	-0.993	-4.994***	-20.703***
	(4.365)	(2.677)	(2.324)	(2.286)	(1.992)	(4.784)	(4.225)	(2.593)	(2.288)	(2.252)	(1.812)	(4.848)
High γ - Low γ						-8.452**						-9.853**
						(3.976)						(3.851)

Panel B: Low ROA only

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Low γ industries	9.030***	-1.906	0.989	-3.512	-4.673**	-13.703***	7.903***	-0.380	-1.006	-3.144	-1.934	-9.837***
	(2.753)	(1.981)	(2.846)	(2.828)	(2.033)	(3.665)	(2.436)	(2.375)	(3.374)	(3.307)	(1.989)	(3.294)
High γ industries	12.929***	3.088	0.888	-0.005	-6.213***	-19.142***	14.612***	1.531	-0.295	-4.128*	-8.864***	-23.476***
	(3.924)	(2.575)	(2.301)	(2.250)	(2.303)	(4.798)	(4.291)	(2.491)	(2.248)	(2.460)	(2.634)	(5.611)
High γ - Low γ						[illegible]						[illegible]

Table 13
Calibrated parameters

This table presents values of the parameters for our model. Dynamic parameters are calibrated at a quarterly frequency. We also report whether the parameters are obtained from the literature, from our own estimates or calibrated to match specific moments of the data. Aggregate quantities for China and the USA are from the World Bank (data.worldbank.org/indicator).

Parameter	Symbol	Value	Source
Preferences (dynamic):			
Subjective Discount rate	β	0.99	Bansal and Yaron (2004)
Elasticity of intertemporal substitution	ψ	1.5	Bansal and Yaron (2004)
Relative risk aversion	ν	20	
Industry Organization:			
Manufacturing expenditure shares	$a_0, a_0^\star$	0.1 - 0.9	
Elasticity of consumer demand	σ_J	3.8	Ghironi and Melitz (2005)
Elasticity across industries	θ	1.2	Loualiche (2015)
Pareto tail parameter	γ_J	3.4	Ghironi and Melitz (2005)
Production Technology:			
Labor supply	$L, L^\star$	1 - 3	Ratio of working age population (China to USA)
Mass of firms in each industry	M_J	1	Average import penetration
	$M_J^\star$	30 - 15	
Trade:			
Iceberg costs	τ_J	1 - 1.5	Ghironi and Melitz (2005)
Exporting fixed costs	$f_J, f_J^\star$	$5 - 3 \cdot 10^{-5}$	Fraction of exporters
Aggregate Fluctuations:			
Domestic productivity process	μ_A	7	Ratio of GDP per capita (USA to China)
	σ_A	1.6%	USA GDP
	ρ_A	0.976	USA GDP
Foreign productivity process	$\mu_{A^\star}$	1	
	$\sigma_{A^\star}$	6%	China Import to the USA
	$\rho_{A^\star}$	0.961	China Import to the USA

Table 14
Model simulation – Key moment conditions

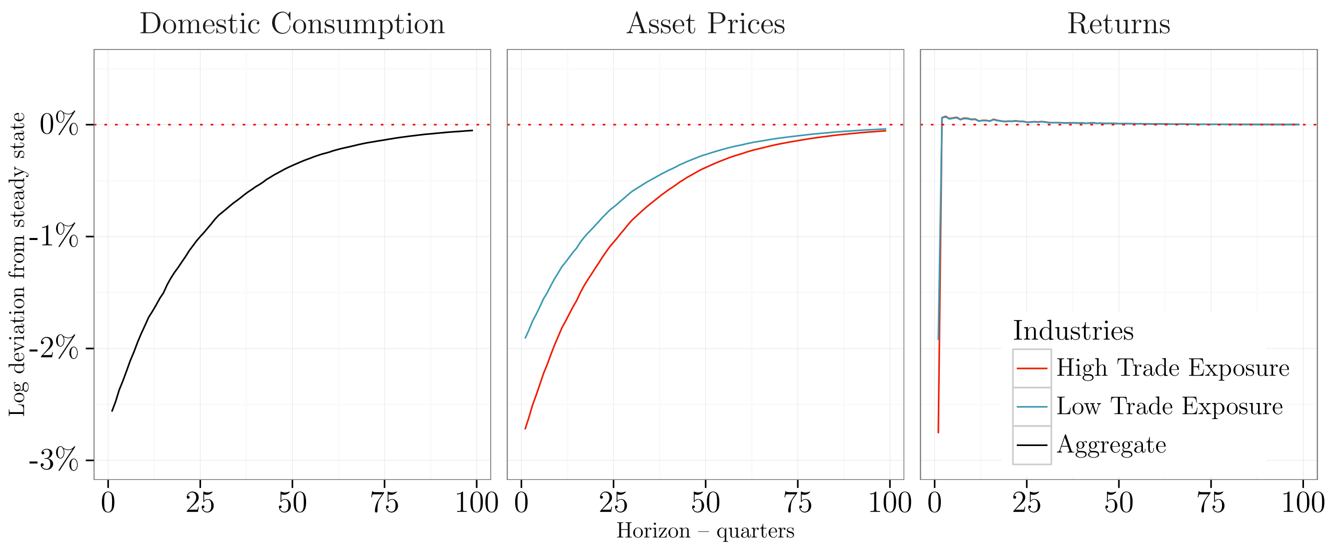
This table reports key moments from simulations of our model. The model is simulated for one million periods under the shock processes described in the calibration table 13. Italic values are derived from our own empirical estimates in the actual data.

Quantities by Sectors				
	High exposure industry		Low exposure industry	
Import Penetration ($\mathcal{I}_J$)				
Average	24.5%	*(25%)*	12%	*(11%)*
Std. deviation	12%	*(11%)*	3.5%	*(4%)*
Cov($A^\star, \cdot$)	0.52		0.13	
Cov($A, \cdot$)	-1.15		-0.35	
Domestic Profits ($\pi_{D,J}$)				
Cov($A^\star, \cdot$)	-1.00		-0.49	
Cov($A, \cdot$)	2.3		1.1	
Fraction of Exporters (ζ_J)				
Average	6%	*[5% - 30%]*	4.5%	*[5% - 30%]*
Aggregate Quantities				
	Aggregate Consumption (C_t)		Risk-free rate (annualized)	
Average	-		3.3%	*(4.9%)*
Std. deviation	7%	*(2%)*	0.6%	*(3.2%)*
Cov($A^\star, \cdot$)	-0.31		-5.5	
Cov($A, \cdot$)	0.78		2.0	
Average Excess Returns				
	High exposure industry		Low exposure industry	
Domestic Firms				
Average excess returns	1.29%	*(19.6%)*	0.92%	*(11.5%)*
Std. deviation	11%	*(10%)*	8%	*(7%)*
Cov($\varepsilon_{A^\star}, \cdot$)	-5.07		-3.6	
Cov($\varepsilon_A, \cdot$)	0.25		0.16	
Average Exporters				
Average excess returns	0.94%		0.76%	
Std. deviation	8.1%		6.5%	
Cov($\varepsilon_{A^\star}, \cdot$)	-3.6		-2.86	
Cov($\varepsilon_A, \cdot$)	0.105		0.06	

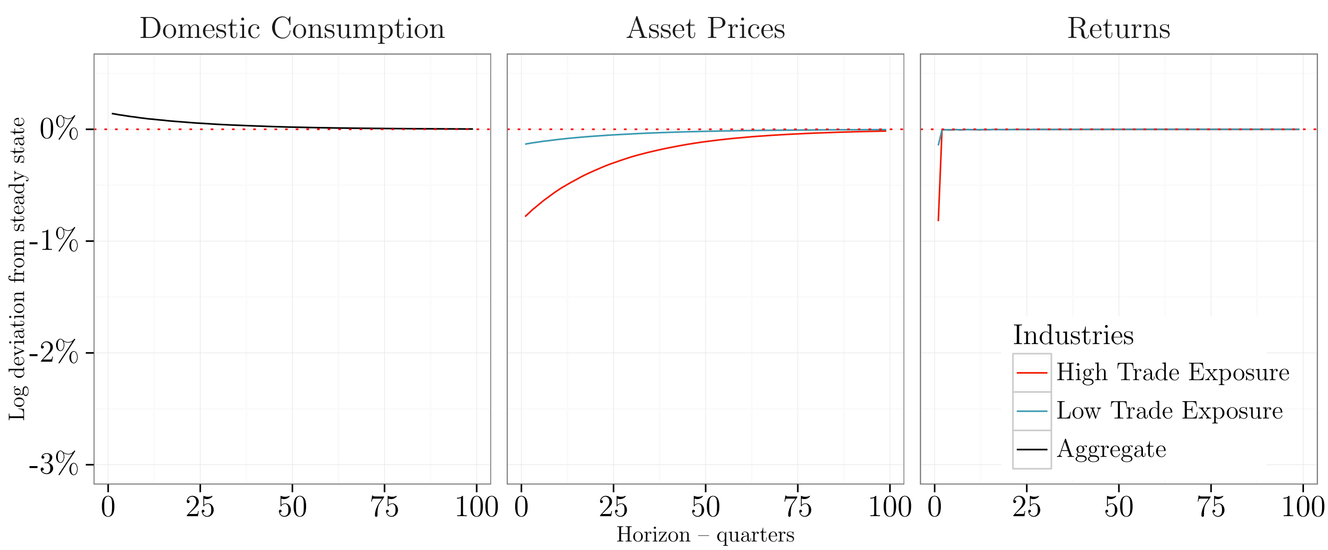
Figure 1

Impulse Response – Shock to $A^{\star}$ with and without risk-sharing

(a) IRF without risk-sharing

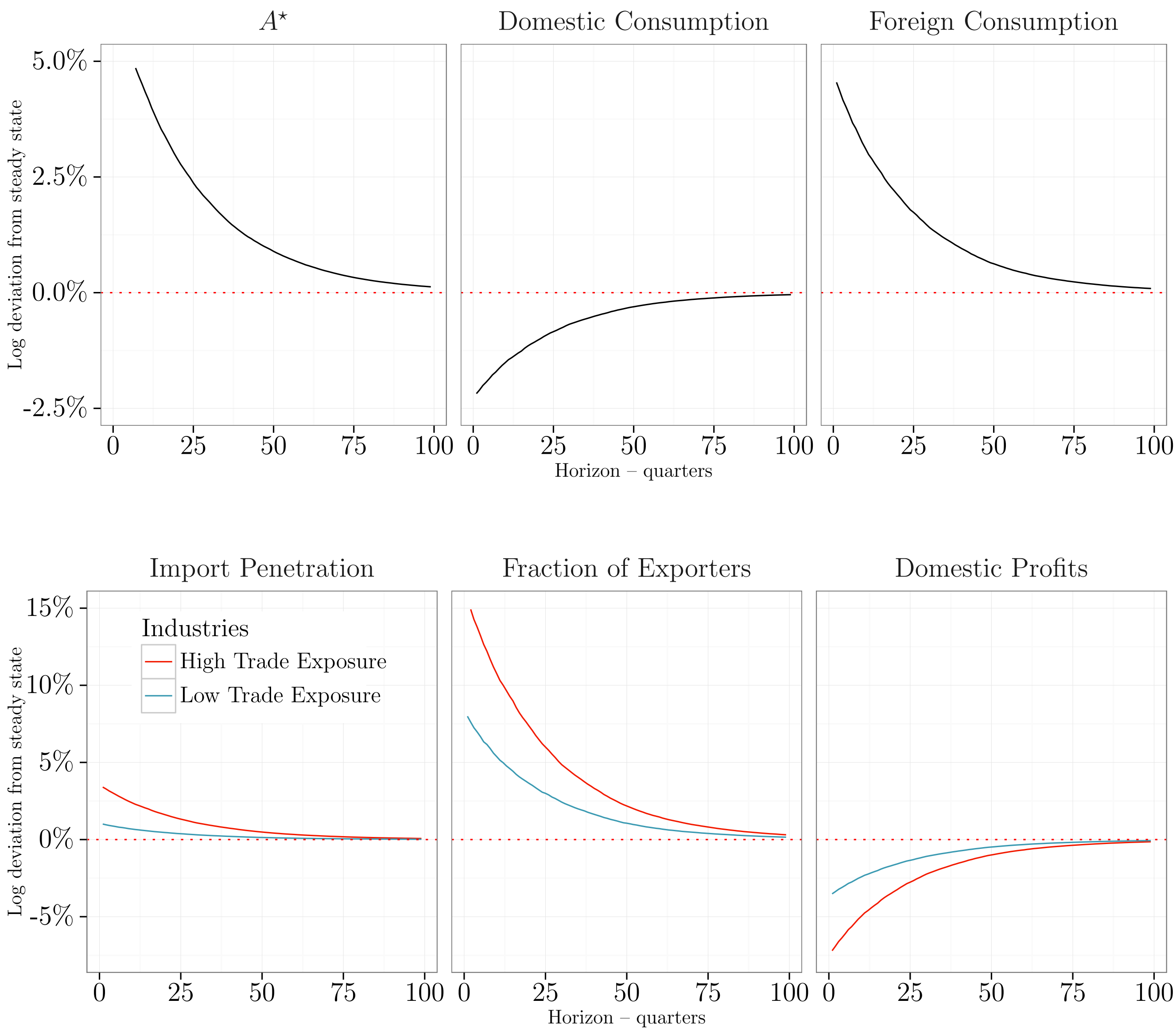


(b) IRF with perfect risk-sharing



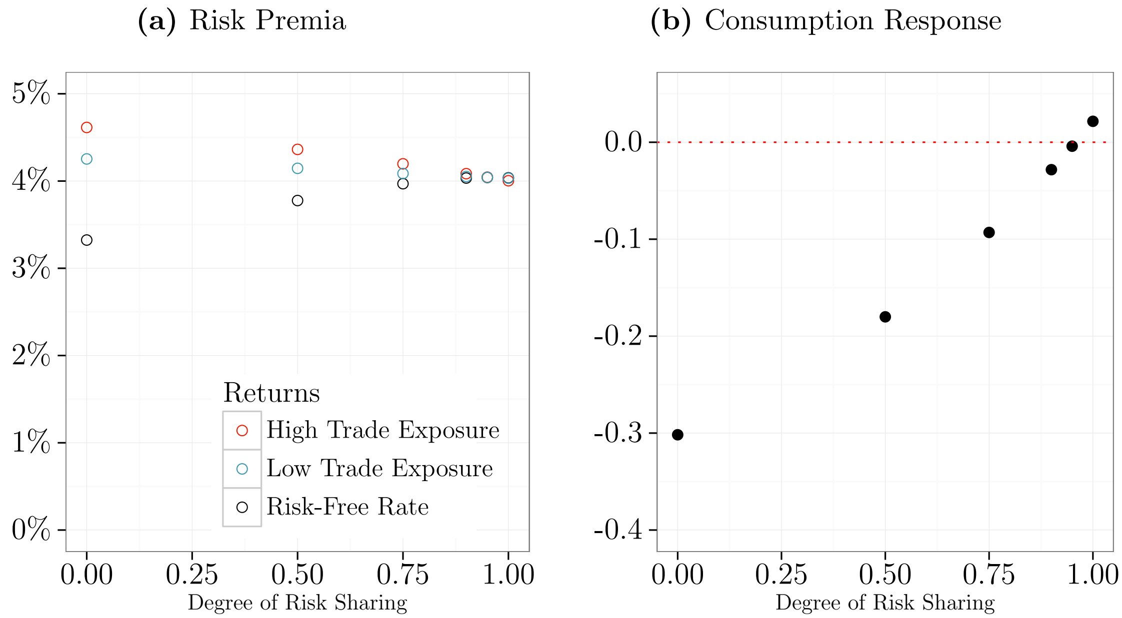
We plot the Impulse Response Function to a shock $\varepsilon^{A^{\star}}$ from 500 model simulations. Quantities are log-deviation from their non-stochastic steady-state values. Domestic consumption and foreign consumption are C_t and $C_t^{\star}$ in the model, respectively. Import penetration is $\mathcal{I}_J$, the fraction of exporters is ζ_J and domestic profits is $\pi_{D,J}$. Red lines correspond to industries with low trade costs that are more exposed to foreign competition. Blue lines are industries with higher trade costs.

Figure 2
Impulse Response – Shock to $A^{\star}$ without risk sharing



We plot the Impulse Response Function to a shock $\varepsilon^{A^{\star}}$ from 500 model simulations. Quantities are log-deviation from their non-stochastic steady-state values. Domestic consumption and foreign consumption are C_t and $C_t^{\star}$ in the model, respectively. Import penetration is $\mathcal{I}_J$, the fraction of exporters is ζ_J and domestic profits is $\pi_{D,J}$. Red lines correspond to industries with low trade costs that are more exposed to foreign competition. Blue lines are industries with higher trade costs.

Figure 3
Sensitivity Analysis - Degree of risk sharing



In panel 3a we rsimulate the model for one million of periods and estimate average returns for different values of the risk sharing parameter Ξ between zero and one. We include the risk-free rate to illustrate how returns exposed to trade act as a hedge with sufficient risk sharing. Finally, from these simulations we also represent the elasticity of consumption to shocks to foreign productivity $A^{\star}$.

Online Appendix

The Globalization Risk Premium

This Online Appendix includes the full derivation of the model and details about the calibration (Appendix A), as well as a series of robustness tables (Appendix B).

A Model

A.1 Model derivation

A.1.1 Static demand

We proceed in three steps due to the structure of the demand system. First we derive respective demand for differentiated good sectors and the homogeneous good sector. The upper-tier optimization program for consumers is

$$\max_{C_T, c_0} c_0^{1-a_0} \cdot C_T^{a_0}, \quad \text{s.t.} \quad P_T C_T + p_0 c_0 \leq Y,$$

where C_T is the consumption index aggregated from consumption in the $\mathcal{J}$ industries, P_T the price index for this aggregator, p_0 the price of the homogeneous good, and Y is the total income of consumers. From first order conditions we derive the aggregate price index P and demand for each type of goods:

$$\begin{aligned} P &= \left(\frac{P_T}{a_0}\right)^{a_0} \left(\frac{p_0}{1-a_0}\right)^{1-a_0}, \qquad \text{(A.1)} \\ c_0 &= (1-a_0)\frac{PC}{p_0}, \\ C_T &= a_0 \frac{PC}{P_T}. \end{aligned}$$

The second tier of optimization decides allocation across the $\mathcal{J}$ industries. The aggregation over industry consumption index is constant elasticity of substitution with elasticity θ. The optimization problem reads as follows:

$$\max_{\{C_J\}} \left(\sum_J C_J^{\frac{\theta-1}{\theta}}\right)^{\frac{\theta}{\theta-1}} \quad \text{s.t} \quad \sum_J P_J C_J \leq P_T C_T,$$

where $\{P_J\}$ are the industry price levels. The optimal allocations are:

$$C_J = \left(\frac{P_J}{P_T}\right)^{-\theta} \cdot C_T, \qquad \text{(A.2)}$$

such that we have industry expenditures:

$$P_J C_J = \left(\frac{P_J}{P_T}\right)^{1-\theta} a_0 \cdot PC. \qquad \text{(A.3)}$$

The price index for manufacturing, aggregated, is:

$$P_T = \left[\sum_J P_J^{1-\theta}\right]^{\frac{1}{1-\theta}}. \qquad \text{(A.4)}$$

Finally we derive the variety level demand given consumption in each sector, $c_J(\omega)$. The optimization problem at the sectoral level in industry J is:

$$\max_{c_J(\omega)} \left[\int_{\Omega_J} c_J(\omega)^{\frac{\sigma_J - 1}{\sigma_J}} d\omega\right]^{\frac{\sigma_J}{\sigma_J - 1}} \quad \text{s.t.} \quad \int_{\Omega_J} p_J(\omega) c_J(\omega) d\omega \leq P_J C_J.$$

From first order conditions, we derive the industry price index and the individual variety demand:

$$P_J = \left[\int_{\Omega_J} p_J(\omega)^{1-\sigma_J} d\omega \right]^{\frac{1}{1-\sigma_J}},$$
$$c_J(\omega) = \left(\frac{p_J(\omega)}{P_J} \right)^{-\sigma_J} \cdot C_J.$$

A.1.2 Supply

Sector 0 — We assume sector 0 produces an homogenous good with linear technology in labor and unit productivity. This sector is perfectly competitive such that it sets prices at marginal cost and we have $p_0 = w$. In each country we take this good as the numeraire such that we have $p_0 = w = 1$. Moreover since all firms in sector 0 are competitive there are no revenues to be redistributed from the sector.

Other sectors — Firms in the other sectors are operating in a monopolistic competition setting and set their prices at a markup over marginal cost. Firms face isoelastic demand curves in each industry, with elasticity σ_J, hence they set their prices $p_J(\varphi)$, at a markup $\sigma_J/(\sigma_J - 1)$ over their marginal costs. In that case we write both prices on the domestic and export market as:

$$p_J(\varphi) = \frac{\sigma_J}{\sigma_J - 1} \cdot \frac{1}{A\varphi} \tag{A.5}$$
$$p_{X,J}(\varphi) = \tau_J \cdot p_J(\varphi), \tag{A.6}$$

Firm profits also depend on their status as an exporter. If productivity is too low, a firm might not find it optimal to export and pay the flow fixed costs f_J. Firms profit is increasing in their idiosyncratic productivity, hence there exists a productivity cutoff in each industry under which a firm decides not to export: $\varphi_{X,J} = \min_\varphi\{\varphi|\varphi \text{ is an exporter}\}$. In that case real profits at the firm level are:

$$\begin{aligned} \pi_{D,J}(\varphi) &= \frac{1}{\sigma_J} \cdot \left(\frac{p_J(\varphi)}{P_J} \right)^{1-\sigma_J} \cdot P_J C_J \\ &= \frac{p_J(\varphi)}{\sigma_J} \cdot \left(\frac{p_J(\varphi)}{P_J} \right)^{-\sigma_J} \cdot \left(\frac{P_J}{P_T} \right)^{1-\theta} \cdot a_0 \cdot PC. \end{aligned} \tag{A.7}$$

And for export profits at the firm level we have:

$$\begin{aligned} \pi_{X,J}(\varphi) &= \frac{1}{\sigma_J} \cdot \left(\frac{p_{X,J}(\varphi)}{P_J^\star} \right)^{1-\sigma_J} \cdot P_J^\star C_J^\star - \frac{f_J}{A}, \\ &= \frac{1}{\sigma_J} \cdot \left(\frac{p_{X,J}(\varphi)}{P_J^\star} \right)^{1-\sigma_J} \cdot \left(\frac{P_J^\star}{P_T^\star} \right)^{1-\theta} \cdot a_0^\star \cdot P^\star C^\star - \frac{f_J}{A}. \end{aligned} \tag{A.8}$$

where P_J is the industry price index for the composite good in industry J consumed in the domestic country. To find the industry price index we need to determine the mass of firms from the foreign country exporting in industry J: $M_{X,J}^\star$. Given the productivity cutoff for exporters from the foreign country, $\varphi_{X,J}^\star$, the fraction of exporters, denoted $\zeta_J^\star$ is simply:

$$\zeta_J^\star := \Pr\{\tilde{\varphi} > \varphi_{X,J}^\star\} = \left(\frac{\varphi_{X,J}^\star}{\underline{\varphi}_J^\star} \right)^{-\gamma_J} \tag{A.9}$$

Now the price index in industry J reflects the effect of an increase in competition from the foreign country leading to lower industry level prices:

$$P_J = \left(M_J \int_{\Omega_{D,J}} p_J(\varphi)^{1-\sigma_J} \mathrm{d}\varphi + (\zeta_J^\star M_J^\star) \int_{\Omega^\star_{X,J}} p^\star_{X,J}(\varphi)^{1-\sigma_J} \mathrm{d}\varphi \right)^{\frac{1}{1-\sigma_J}},$$

where $\Omega_{D,J}$ is the set of firms producing in the domestic economy, that is $[\underline{\varphi}_J, +\infty[$ for the domestic case; and $\Omega^\star_{X,J}$ is the set of firms from the foreign country exporting to the domestic country in industry J, that is in our case: $[\varphi^\star_{X,J}, +\infty[$. Given the exporters' profits, we derive the productivity cutoffs for exporters defined by: $\varphi_{X,J} = \min\{\varphi | \pi_{X,J}(\varphi) > 0\}$. We have the following expression for the cutoff in the domestic country (the foreign country cutoffs are symmetric):

$$(\varphi_{X,J})^{\sigma_J - 1} = f_J \sigma_J \left(\tau_J \frac{\sigma_J}{\sigma_J - 1} \right)^{\sigma_J - 1} \cdot A^{-\sigma_J} \cdot (P_J^\star)^{1-\sigma_J} \cdot \left[\left(\frac{P_J^\star}{P_T^\star} \right)^{1-\theta} \cdot a_0^\star P^\star C^\star \right]^{-1}. \tag{A.10}$$

Aggregation of supply — As in Melitz (2003), instead of keeping track of the distribution of production and prices, it is sufficient to analyze average producers, first for the whole domestic market $\bar{\varphi}_J$ and second restricted to exporting firms $\bar{\varphi}_{X,J}$. These quantities are sufficient to define the equilibrium

$$\bar{\varphi}_J := \left[\int_{\underline{\varphi}_J}^{\infty} \varphi^{\sigma_J - 1} \mathrm{d}G_J(\varphi) \right]^{\frac{1}{\sigma_J - 1}} = \nu_J \cdot \underline{\varphi}_J$$

$$\bar{\varphi}_{X,J} := \left[\int_{\varphi_{X,J}}^{\infty} \varphi^{\sigma_J - 1} \mathrm{d}G_J(\varphi) \right]^{\frac{1}{\sigma_J - 1}} = \nu_J \cdot \varphi_{X,J},$$

where ν_J, the average of firm productivity under a Pareto distribution, is given by $\nu_J = \left(\frac{\gamma_J}{\gamma_J - (\sigma_J - 1)} \right)^{\frac{1}{\sigma_J - 1}}$, and depends only on the elasticity of substitution, σ and the tail parameter of the distribution, γ.

Hence average profits for domestic firms in industry J are: $\langle \pi_{D,J} \rangle = \pi_{D,J}(\bar{\varphi}_J)$, and for exporters $\langle \pi_{X,J} \rangle = \pi_{X,J}(\bar{\varphi}_{X,J})$. Given the average profits, total profits for each industry are:

$$\Pi_J = M_J \cdot \langle \pi_J \rangle := M_J \left[\pi_{D,J}(\bar{\varphi}_J) + \zeta_J \pi_{X,J}(\bar{\varphi}_{X,J}) \right] \tag{A.11}$$

Aggregation allows us to simplify the expression for industry price index P_J:

$$P_J = \left(M_J \cdot p_J(\bar{\varphi}_J)^{1-\sigma_J} + \zeta_J^\star M_J^\star \cdot p^\star_{X,J}(\bar{\varphi}_{X,J})^{1-\sigma_J} \right)^{\frac{1}{1-\sigma_J}} \tag{A.12}$$

$$= \left(M_J \cdot \left(\frac{\frac{\sigma_J}{\sigma_J - 1}}{A \bar{\varphi}_J} \right)^{1-\sigma_J} + \zeta_J^\star M_J^\star \cdot \left(\frac{\frac{\sigma_J}{\sigma_J - 1} \tau_J^\star}{A^\star \bar{\varphi}_{X,J}} \right)^{1-\sigma_J} \right)^{\frac{1}{1-\sigma_J}} \tag{A.13}$$

(A.14)

A.2 Cash-flow effects

A.2.1 Import penetration

First let us define import penetration as:

$$\mathcal{I}_J = \frac{M_J^\star \zeta_J^\star \; (p_{X,J}^\star(\bar\varphi_{X,J}^\star))^{1-\sigma_J}}{P_J^{1-\sigma_J}} \tag{A.15}$$

It represents the marginal impact of foreign firms on the domestic price index for a given industry. Given our definition of P_J, import penetration is bounded: $\mathcal{I}_J \in [0,1]$.

Lemma 1. *The level of import penetration $\mathcal{I}_J$ is decreasing with trade costs τ_J.*

Proof of lemma 1. We start by rewriting equation (A.15) as:

$$\mathcal{I}_J = 1 - \frac{M_J \; p_J(\bar\varphi_J)^{1-\sigma_J}}{M_J p_J(\bar\varphi)^{1-\sigma_J} + \zeta_J^\star M_J^\star p_{X,J}^\star(\bar\varphi_{X,J})^{1-\sigma_J}},$$

where the only dependency in τ_J is in $\zeta_J^\star$ and $p_{X,J}^\star$. Hence we only need to show that $\zeta_J^\star p_{X,J}^\star(\bar\varphi_{X,J})^{1-\sigma_J}$ is decreasing with τ_J. From (A.5) and (A.9), we have:

$$\zeta_J^\star p_{X,J}^\star(\bar\varphi_{X,J})^{1-\sigma_J} \propto \left(\tau_J^{\sigma-1}(\varphi_{X,J}^\star)^{\gamma-(\sigma-1)}\right)^{-1}$$

Since $\gamma > \sigma - 1$, we need to show that $\varphi_{X,J}^\star$ is increasing with τ_J. From the definition of $\varphi_{X,J}^\star$ (see (A.10)), we have

$$\varphi_{X,J}^\star \propto \tau_J^{\sigma-1}\left[M_J p_J(\bar\varphi_J)^{1-\sigma} + \zeta_J^\star M_J^\star p_{X,J}^\star(\bar\varphi_{X,J}^{1-\sigma_J})\right]^{\frac{\theta-\sigma}{1-\sigma}}$$

And we have the following formula for the elasticity

$$\frac{\tau_J}{\varphi_{X,J}^\star}\cdot\frac{\partial\varphi_{X,J}^\star}{\partial\tau_J} = (\sigma-1)\left(1-\frac{\sigma-\theta}{\sigma-1}\mathcal{I}_J\right) - \frac{\sigma-\theta}{\sigma-1}(\gamma-(\sigma-1))\mathcal{I}_J\cdot\frac{\tau_J}{\varphi_{X,J}^\star}\cdot\frac{\partial\varphi_{X,J}^\star}{\partial\tau_J}$$

And since $(\sigma-\theta)/(\sigma-1)\mathcal{I}_J < 1$, we conclude that $\partial_{\tau_J}\varphi_{X,J}^\star > 0$ and this concludes the proof. ∎

A.2.2 Domestic profits

Lemma 2. *The elasticity of firms domestic cash flows to foreign productivity shocks is:*

$$\mathcal{E}^\star(\pi_{D,J}(\varphi)) = -\frac{\mathcal{I}_J}{1+\kappa_J\mathcal{I}_J}\cdot((\sigma_J-1)+\kappa_J\sigma_J) + \frac{\mathcal{E}^\star(PC)}{1+\kappa_J\mathcal{I}_J}, \tag{A.16}$$

where $\kappa_J = \frac{\gamma_J}{\sigma_J-1} - 1 > 0$ is a parameter defined for notational convenience, and $\mathcal{I}_J$ is the level of import penetration in industry J defined in A.15. Ignoring the second term due to demand effects, we obtain that domestic firms' cash flows respond negatively to foreign productivity shocks.

Proof of lemma 2. We start by expressing profits as a function of industry demand and aggregate demand from (A.2) and (A.7):

$$\pi_{D,J}(\varphi) = \underbrace{\frac{1}{\sigma_J}}_{\text{Unit profit}} \cdot \underbrace{\left(\frac{p_J(\varphi)}{P_J}\right)^{1-\sigma_J}}_{\text{Local variety demand}} \cdot \underbrace{\left(\frac{P_J}{P_T}\right)^{1-\theta}}_{\text{Industry share}} \cdot \underbrace{a_0\cdot P\;C}_{\text{aggregate demand}}$$

A shock to foreign productivity affects two quantities: variety demand and total expenditures. There are second order effects of redistribution through the industry shares. We verify that they are small in the calibration and ignore them in the the derivation that follows. The elasticity of domestic profits is:

$$\mathcal{E}^\star(\pi_{D,J}(\varphi)) = \underbrace{-(\sigma_J - 1)\cdot(-\mathcal{E}^\star(P_J))}_{\text{Competition effect}} + \underbrace{\mathcal{E}^\star(PC)}_{\text{Expenditure effects}} . \tag{A.17}$$

Competition effect. Observe that the competition effect in (A.17) differ across industries. Using (A.12), we obtain the following elasticity for the price index in industry J:

$$\begin{aligned}\mathcal{E}^\star(P_J) &= \frac{M_J^\star \zeta_J^\star\, p_{X,J}^\star(\bar{\varphi}_{X,J}^\star)^{1-\sigma_J}}{P_J^{1-\sigma_J}} \cdot \left[\frac{\partial \log p_{X,J}^\star}{\partial \log \varphi_{X,J}^\star}\frac{\partial \log \varphi_{X,J}^\star}{\partial \log A^\star} + \frac{1}{1-\sigma_J}\frac{\partial \log \zeta_J^\star}{\partial \log A^\star}\right] \\ &= -\mathcal{I}_J \cdot \left[1 + \left(\frac{\gamma_J}{\sigma_J - 1} - 1\right)\left(-\mathcal{E}^\star(\varphi_{X,J}^\star)\right)\right],\end{aligned} \tag{A.18}$$

where we have used the following equality (from the definition of $\zeta_J^\star$):

$$\mathcal{E}^\star(\zeta_J^\star) = -\gamma_J \cdot \mathcal{E}^\star(\varphi_{X,J}^\star) \tag{A.19}$$

Productivity cutoff. Using the definition of $\varphi_{X,J}^\star$ from the zero-profit cutoff condition, $\pi_{X,J}^\star = 0$ in equation (A.10), we have to a first order approximation:

$$\varphi_{X,J}^\star \propto (A^\star)^{-\frac{\sigma_J}{\sigma_J-1}} \cdot P_J^{-1} \cdot (PC)^{-\frac{1}{\sigma_J-1}}.$$

where the coefficient of proportionality does not depend on A or $A^\star$. Hence the elasticity of the foreign productivity cutoff is given by:

$$\mathcal{E}^\star(\varphi_{X,J}^\star) = -\frac{\sigma_J}{\sigma_J - 1} - \mathcal{E}^\star(P_J) - \frac{1}{\sigma_J - 1}\mathcal{E}^\star(PC), \tag{A.20}$$

where the first term increases the cutoff due to an increase in competition, and the second lowers it due to an increase in industry demand. The last term comes from aggregate demand and lowers the cutoff.

Combining (A.18) and (A.20), we obtain:

$$\mathcal{E}^\star(P_J) = -\frac{\mathcal{I}_J}{1+\kappa_J \mathcal{I}_J} \cdot \left[1 + \kappa_J \frac{\sigma_J}{\sigma_J - 1} + \frac{\kappa_J}{\sigma_J - 1}\cdot \mathcal{E}^\star(PC)\right],$$

where $\kappa_J = \frac{\gamma_J}{\sigma_J - 1} - 1$ is positive.

Combined with (A.17), we obtain the effect of foreign shocks on domestic profits:

$$\mathcal{E}^\star(\pi_{D,J}(\varphi)) = \frac{-\mathcal{I}_J \cdot ((\sigma_J - 1) + \kappa_J \sigma_J) + \mathcal{E}^\star(PC)}{1 + \kappa_J \mathcal{I}_J}, \tag{A.21}$$

and this concludes the proof. ∎

A.2.3 Export profits

Lemma 3. *The elasticity of firms foreign cash flows to foreign productivity shocks is:*

$$\mathcal{E}^\star\left(\pi_{X,J}(\varphi)\right) = \left[-\frac{(1-\mathcal{I}_J^\star)}{1+\kappa_J \mathcal{I}_J^\star}\cdot(\sigma_J - 1) + \frac{\mathcal{E}^\star(P^\star C^\star)}{1+\kappa_J \mathcal{I}_J^\star}\right]\cdot(1 + \ell_J(\varphi)) \tag{A.22}$$

with $\ell_J(\varphi) = \frac{1}{\left(\frac{\varphi}{\varphi_{X,J}}\right)^{\sigma_J - 1} - 1}$ *representing the operating leverage of exporters.*

Export profits are affected by two antagonist forces. When firms in the foreign country become more productive, exporters from the domestic country lose market share - a business stealing channel similar to the one affecting domestic cash flows. However, as the foreign economy grows with productivity, there is also a market size effect that counteracts the first effect. The last term in equation (A.22) captures an operating leverage channel driven by the fixed costs associated with exporting.

Proof of lemma 3. First we decompose export profits from(A.8) as follows:

$$\pi_{X,J}(\varphi) = \underbrace{\frac{1}{\sigma_J}}_{\text{Unit profit}} \cdot \underbrace{\left(\frac{p_{X,J}(\varphi)}{P_J^\star}\right)^{1-\sigma_J}}_{\text{Local variety demand}} \cdot \underbrace{\left(\frac{P_J^\star}{P_T^\star}\right)^{1-\theta}}_{\text{Industry share}} \cdot \underbrace{a_0 \cdot P^\star\ C^\star}_{\text{aggregate demand}} - \underbrace{\frac{f_J}{A}}_{\text{fixed costs}}$$

A shock to foreign productivity affects two quantities: variety demand and total expenditures. There are second order effects of redistribution through the industry shares. We verify that they are small in the calibration and ignore them in the derivation below. First we derive the elasticity of export profits, absent the fixed costs. We show later that the fixed costs translate into operating leverage.

$$\mathcal{E}^\star\left(\pi_{X,J}(\varphi) + f_J/A\right) = \underbrace{-(\sigma_J - 1)\cdot(-\mathcal{E}^\star(P_J^\star))}_{\text{Competition effect}} + \underbrace{\mathcal{E}^\star(P^\star C^\star)}_{\text{Expenditure effects}}. \tag{A.23}$$

The elasticity of the price index in industry J in the foreign country is:

$$\begin{aligned}\mathcal{E}^\star(P_J^\star) &= -\frac{M_J^\star p_J^\star(\bar{\varphi}_J^\star)^{1-\sigma_J}}{(P_J^\star)^{1-\sigma_J}} - \left(\frac{\gamma_J}{\sigma_J - 1} - 1\right)\cdot \frac{M_J \zeta_J p_{X,J}(\bar{\varphi}_{X,J})^{1-\sigma_J}}{(P_J^\star)^{1-\sigma_J}}\left(-\mathcal{E}^\star(\varphi_{X,J})\right) \\ &= -\left(1 - \mathcal{I}_J^\star\right) - \mathcal{I}_J^\star \cdot \left(\frac{\gamma_J}{\sigma_J - 1} - 1\right)\cdot\left(-\mathcal{E}^\star(\varphi_{X,J})\right). \end{aligned} \tag{A.24}$$

where $\mathcal{I}_J^\star$ is import penetration in the foreign country. The first term comes from the direct effect of foreign productivity on prices of goods produced by foreign firms in the foreign country. The second term comes from the extensive margin and is also negative since $\gamma_J > \sigma_J - 1$ and $\mathcal{E}^\star(\varphi_{X,J}) < 0$.

Moreover, since the productivity cutoff is:

$$\varphi_{X,J} \propto (P_J^\star)^{-1} \cdot (P^\star C^\star)^{-\frac{1}{\sigma_J - 1}},$$

we obtain:

$$\mathcal{E}^\star\left(\varphi_{X,J}\right) = -\mathcal{E}^\star\left(P_J^\star\right) - \frac{1}{\sigma_J - 1}\cdot \mathcal{E}^\star\left(P^\star C^\star\right). \tag{A.25}$$

Finally we derive the role played by γ_J on the fraction of exporters in the domestic country ζ_J. We find that $\partial_{\gamma_J}\zeta_J < 0$. Using the formula for ζ_J and $\varphi_{X,J}$ we have:

$$\zeta_J = \underline{\varphi}_J^{\gamma_J} \cdot \left(M_J^\star p_J^\star(\bar{\varphi}_J^\star)^{1-\sigma_J} + \zeta_J M_J\ \left(p_{X,J}(\nu_J \varphi_{X,J})\right)^{1-\sigma_J}\right)^{-\gamma_J \sigma_J}$$

After some algebra we confirm that ζ_J is decreasing with γ_J:

$$\frac{1}{\zeta_J}\cdot\frac{\partial \zeta_J}{\partial \gamma_J} = \frac{\log \zeta_J}{1 + \mathcal{I}_J^\star/(\sigma - 1)},$$

which is negative since the fraction of firm exporting ζ_J is smaller than one.

Combining (A.24) and (A.25), we obtain the elasticity of the foreign price index in industry J:

$$\mathcal{E}^\star\left(P_J^\star\right) = -\frac{1-\mathcal{I}_J^\star}{1+\kappa_J\mathcal{I}_J^\star} - \frac{\mathcal{I}_J^\star}{1+\kappa_J\mathcal{I}_J^\star}\frac{\kappa_J}{\sigma_J-1}\mathcal{E}^\star(P^\star C^\star)$$

Combined with (A.23), we obtain the elasticity of export profits net of fixed costs:

$$\mathcal{E}^\star\left(\pi_{X,J}(\varphi) + f_J/A\right) = -(\sigma_J-1)\cdot\frac{1-\mathcal{I}_J^\star}{1+\kappa_J\mathcal{I}_J^\star} + \left(1-\kappa_J\frac{\mathcal{I}_J^\star}{1+\kappa_J\mathcal{I}_J^\star}\right)\mathcal{E}^\star(P^\star C^\star)$$

Once we include fixed costs, we have:

$$\mathcal{E}^\star\left(\pi_{X,J}(\varphi)\right) = \frac{-\left(1-\mathcal{I}_J^\star\right)\cdot(\sigma_J-1)+\mathcal{E}^\star(P^\star C^\star)}{1+\kappa_J\mathcal{I}_J^\star}\cdot(1+\ell_J(\varphi)) \tag{A.26}$$

with $\ell_J(\varphi) = \frac{1}{\left(\frac{\varphi}{\varphi_{X,J}}\right)^{\sigma_J-1}-1}$ representing the operating leverage of exporters. This concludes the proof.

■

A.2.4 Proof of Proposition 1

Let us first recall Proposition 1:

Consider two industries (L, H) in the same country, both affected by the same shock to foreign productivity $A^\star$. If trade costs are lower in industry L – that is $\tau_L < \tau_H$ –, then:

(a) The elasticity of profit to a shock to foreign productivity for small (non-exporters) firms is more negative in industry $L : \mathcal{E}^\star(\pi_L)_{\text{non-exporters}} < \mathcal{E}^\star(\pi_H)_{\text{non-exporters}}$.

(b) The difference in the elasticity of profit between between low and high trade costs industries is larger (in absolute value) for small firms than for large firms: $(\mathcal{E}^\star(\pi_L) - \mathcal{E}^\star(\pi_H))_{\text{non-exporters}} < (\mathcal{E}^\star(\pi_L) - \mathcal{E}^\star(\pi_H))_{\text{exporters}}$.

(c) The difference in the elasticity of profit to a shock to foreign productivity between low and high trade costs industries for small firms ($(\mathcal{E}^\star(\pi_L) - \mathcal{E}^\star(\pi_H))_{\text{non-exporters}}$) is more negative i) in high demand elasticities (σ) industries; and ii) in high Pareto tail parameter (γ) industries.

Proof of (a). We have shown in Lemma 1 that the level of import penetration $\mathcal{I}_J$ is decreasing with trade costs τ_J. Moreover, observe that the elasticity of firms domestic profits is more negative for higher level of import penetration (see Lemma 2). It follows that the elasticity of domestic profits is decreasing in τ, i.e. $\mathcal{E}^\star(\pi_L)_{\text{non-exporters}} < \mathcal{E}^\star(\pi_H)_{\text{non-exporters}}$.

Proof of (b). Observe first from Lemma 2 that $\mathcal{E}^\star(\pi_{D,L}) < \mathcal{E}^\star(\pi_{D,H}) < 0$. Moreover, we have from Lemma 3 that $\mathcal{E}^\star(\pi_{X,L}) > \mathcal{E}^\star(\pi_{X,H})$. It follows that:

$$\mathcal{E}^\star(\pi_{D,H}) - \mathcal{E}^\star(\pi_{X,H}) > \mathcal{E}^\star(\pi_{D,L}) - \mathcal{E}^\star(\pi_{X,L}) \tag{A.27}$$

The right hand side is negative for low enough trade costs. It is the case in our calibration. Finally, recall the definition of $\alpha_D = \pi_D/\pi$ the share of domestic profits in total profits and $\alpha_X = \pi_X/\pi = 1-\alpha_D$ the share of export profits. Given that the elasticity of total profit for an exporting firm is

$$\mathcal{E}^\star(\pi)_{\text{exporters}} = \alpha_D\mathcal{E}^\star(\pi_D) + \alpha_X\mathcal{E}^\star(\pi_X),$$

we can write the difference between the elasticity of the profit of a purely domestic firm and an exporter as:

$$\mathcal{E}^\star(\pi_D) - \mathcal{E}^\star(\pi)_{\text{exporters}} = (1-\alpha_D)\mathcal{E}^\star(\pi_D) - \alpha_X \mathcal{E}^\star(\pi_X)$$
$$= \alpha_X \cdot (\mathcal{E}^\star(\pi_D) - \mathcal{E}^\star(\pi_X))$$

Finally, we have shown earlier that $\alpha_{X,H} < \alpha_{X,L}$, as the share of export profits is smaller for firms in high trade costs industries. Using this inequality and (A.27), we conclude:

$$\mathcal{E}^\star(\pi_{D,L}) - \mathcal{E}^\star(\pi_{D,H}) < \mathcal{E}^\star(\pi_L)_{\text{exporters}} - \mathcal{E}^\star(\pi_H)_{\text{exporters}}. \tag{A.28}$$

∎

Proof of (c). The proof follows from the elasticity derived in (A.21). The elasticity of domestic profits is more negative for high values of σ_J and γ_J. These negative business-stealing effects are stronger for higher level of import penetration $\mathcal{I}_J$. ∎

A.2.5 Proof of Proposition 2

Let us first recall Proposition 2:

Denote returns in low and high trade costs industries, R_L and R_H, respectively. Suppose that $\mathbf{E}\{R_L\} > \mathbf{E}\{R_H\}$. Observing whether the difference between R^L and R^H is lower or larger between exporters and non-exporters; and within non-exporters, whether the difference between R^L and R^H is lower or larger for (i) low or high demand elasticity industries, and (ii) low or high Pareto tail parameter industries, allows to infer the sign of the price of risk. Specifically:

(a) If $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters}} > (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{exporters}}$, then the price of risk is negative. Otherwise, it is positive.

(b) If $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters,high-}\sigma} > (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters,low-}\sigma}$, then the price of risk is negative. Otherwise, it is positive.

(c) If $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters,high-}\gamma} > (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters,low-}\gamma}$, then the price of risk is negative. Otherwise, it is positive.

Proof. If we write the price of risk for the foreign productivity shock as $\lambda_{A^\star}$, then the difference in expected returns lines up with the difference in cash-flow risk:

$$(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters}} = \lambda_{A^\star} \cdot (\mathcal{E}^\star(\pi_L) - \mathcal{E}^\star(\pi_H))_{\text{non-exporters}}$$
$$(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{exporters}} = \lambda_{A^\star} \cdot (\mathcal{E}^\star(\pi_L) - \mathcal{E}^\star(\pi_H))_{\text{exporters}}$$

Thus if the price of risk is positive ($\lambda_{A^\star} < 0$), we have $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters}} < (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{exporters}}$, a contradiction with Statement (b) in Proposition 1. We then infer that the price of risk is negative.

Using Statement (c) of Proposition 1, the same reasoning allows to infer from observing $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters,high-}\sigma} > (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters,low-}\sigma}$ or $(\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters,high-}\gamma} > (\mathbf{E}\{R_L\} - \mathbf{E}\{R_H\})_{\text{non-exporters,low-}\gamma}$ that the price or risk is negative. ∎

A.3 Other results

A.3.1 Elasticity of profits to domestic productivity shocks

In this Section we discuss what would be the response of profits to domestic productivity shocks. A model with only domestic productivity shocks would generate higher risk premia for large firms (exporters) than for small firms. Large firms' profits benefit more from domestic productivity shocks because of their export margin: they steal market share on the foreign market from foreign firms. Hence large firms are more procyclical to the domestic productivity shock than small firms. Given that domestic productivity has a positive price of risk, this leads to higher risk premium for large firms in equilibrium.

The elasticity of domestic profits is:

$$\mathcal{E}(\pi_{D,J}(\varphi)) = (\sigma_J - 1) - (\sigma_J - \theta)(1 - \mathcal{I}_J) + \frac{\theta + a_0 - 1}{a_0}\mathcal{E}(P) + \mathcal{E}(C).$$

The first term corresponds to the direct increase in market share after a productivity shock for domestic firms; the second dampens the role of this increase; $1 - \mathcal{I}_J$ represents the prominence of domestic firms for the domestic economy (the complement of import penetration). The two last terms come from the reaction of aggregate prices and consumption. We present below the results for the elasticity of export profits:

$$\mathcal{E}(\pi_{X,J}(\varphi)) = (\sigma_J - 1) + \sigma_J \mathcal{E}(P_J^\star) + \mathcal{E}(C_J^\star) - (\sigma_J - 1)\ell_J(\varphi)\mathcal{E}(\varphi_{X,J}).$$

Using the expression for the cutoff elasticity we have:

$$\mathcal{E}(\pi_{X,J}(\varphi)) = \sigma_J(1 + \ell_J(\varphi)) - 1 + (1 + \ell_J(\varphi)) \cdot (\sigma_J \mathcal{E}(P_J^\star) + \mathcal{E}(C_J^\star))$$

Finally average profits for the industry include the extensive margin:

$$\mathcal{E}(\zeta_J \langle \pi_{X,J} \rangle) = \left(\frac{\gamma_J}{\sigma_J - 1} - 1\right) + \frac{\gamma_J}{\sigma_J - 1}\left(\sigma_J \mathcal{E}(P_J^\star) + \mathcal{E}(C_J^\star)\right).$$

This first term is positive and summarizes the increase in productivity for competition and the export decision. The last two terms summarize the response in the foreign economy with an increase in competition through prices and the change in demand, which depends on the risk-sharing arrangement.

A.3.2 Real exchange rate in the model

The nominal exchange rate is normalized to one in our model. However, there are movements in the real exchange rate, defined as: $F = P^\star/P$, the relative price of goods in the foreign country relative to the domestic country. In Figure A.2, we present the response of the exchange rate for the tradable good sector as well as the aggregate exchange rate. We find that the exchange rate $P^\star/P$ declines after a positive foreign productivity shock increase in $A^\star$. The price of goods in the foreign country declines by more than goods in the home country, due to a composition effect in the aggregate good of each economy: more foreign firms produce for the foreign consumption index, thus its price declines by more. By contrast, in response to a shock to domestic productivity, the exchange rate does not move significantly. This is due to the relative size of the domestic economy, which is smaller than the foreign economy in terms of consumption good production. We also simulate the real exchange rate in the economy with risk-sharing ($\Xi = 1$) and find the same results qualitatively and quantitatively.

A.3.3 Bond trading in the model

Following Ghironi and Melitz (2005), we now allow for international trade in bonds. First, bond trading allows for some intertemporal smoothing across countries, in that consumers in each country are now able to trade dynamically risk-free claims across country. Second, introducing bonds allow to study the balance of current accounts of each country in response to productivity shocks.

Bond trading setup. We assume that agents are able to trade domestic and foreign bonds, and that bonds provide a risk-free, real return in units of aggregate consumption for each country. To remedy to the indeterminacy of net foreign assets, we follow the literature and introduce a convex cost in bond trading: agents must pay fees to financial intermediaries when adjusting their bond holdings. This specification pins down uniquely the quantity of bonds in steady state and leads to stationary dynamics in response to shocks.

The budget constraint with bond trading for the domestic representative agent is now:

$$\begin{aligned} P_t \cdot B_{D,t+1} + P_t F_t \cdot B_{X,t+1} + P_t \cdot \frac{\eta_D}{2} B_{D,t+1}^2 + P_t F_t \cdot \frac{\eta_X}{2} B_{X,t+1}^2 + P_t C_t \\ \leq (1 + r_t) P_t B_t + (1 + r_t^\star) F_t P_t B_{X,t} + T_t^f + L + \Pi_t(\Xi) \end{aligned}$$

Here we assume that intermediaries collecting rents from bond trading rebate the fees to the households lump-sum, as T_t^f. Now we are able to define domestic and foreign current accounts as the change in asset holdings from t to $t+1$. That is the current account in each country is:

$$\begin{aligned} \text{CA}_t &= B_{D,t} - B_{D,t-1} + (B_{X,t} - B_{X,t-1}) \cdot F_t \\ \text{CA}_t^\star &= B_{D,t}^\star - B_{D,t-1}^\star + (B_{X,t} - B_{X,t-1})/F_t. \end{aligned}$$

Home and foreign current accounts add to zero when expressed in units of the same consumption basket, that is the world supply of bonds is still zero:

$$\begin{aligned} B_D + B_X^\star &= 0 \\ B_D^\star + B_X &= 0 \end{aligned}$$

With the introduction of four additional variables corresponding to the quantity of bonds traded, we need to add two equations to the market clearing conditions. There are now two Euler equations for the risk-free rate in each country. The fees introduced yield a relation between the price of bonds and the quantity traded in equilibrium, breaking the indeterminacy. We now have the following four Euler equations:

$$\begin{aligned} 1 + \eta_D B_{D,t+1} &= (1 + r_{t+1}) \mathbf{E}\{S_{t,t+1}\} \\ 1 + \eta_X B_{X,t+1} &= (1 + r_{t+1}^\star) \mathbf{E}\left\{S_{t,t+1} \frac{F_{t+1}}{F_t}\right\} \\ 1 + \eta_D B_{D,t+1}^\star &= (1 + r_{t+1}^\star) \mathbf{E}\{S_{t,t+1}^\star\} \\ 1 + \eta_X B_{X,t+1}^\star &= (1 + r_{t+1}) \mathbf{E}\left\{S_{t,t+1}^\star \frac{F_t}{F_{t+1}}\right\} \end{aligned}$$

As in Ghironi and Melitz (2005) we use a parameter of $\eta = 0.0025$ and quadratic adjustment costs to generate sationarity in our model in response to both shocks.

Bond trading results. After introducing international bond trading, we find no significant effect on the risk premium earned by firms in industries exposed to trade (hence we omit figures and tables for this version of the model). The reason is that bond trading does "complete markets" but not in the direction of our agents' hedging demands. The inter-temporal savings decision across country does not protect against the risk of foreign productivity shocks.

In Figure A.3, we plot the response of bonds and current accounts to foreign productivity shocks. After a foreign shock, the demand for savings increases in the foreign economy, leading to initial negative foreign balances. The foreign country is borrowing to finance its production sector, which is now more productive. Foreign households increase their initial borrowing to finance firms, but the borrowing is then quickly reversed.

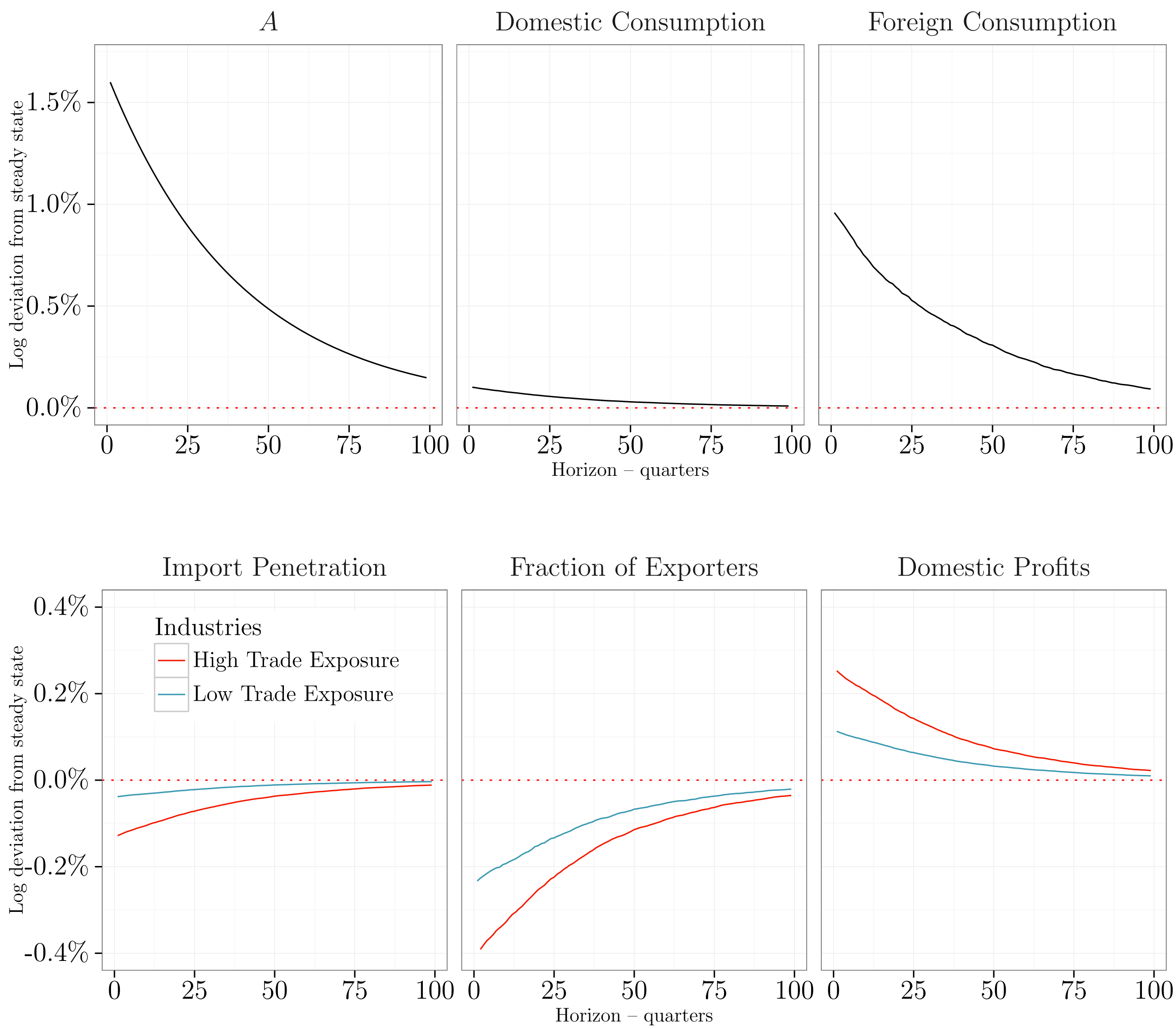
Table A.1
Summary of the model

In this table we summarize all the equilibrium equation required to solve the model and derive firms' valuations.

Variable		Equation
Quantities:		
Aggregate consumption	$C, C^{\star}$	$c_0^{1-a_0} C_T^{a_0}$
Tradable consumption	C_T	$[\sum_J \eta_J^{1/\theta} C_J^{\frac{\theta-1}{\theta}}]^{\frac{\theta}{\theta-1}}$
Industry consumption	C_J	$(P_J/P_T)^{-\theta} C_T$
Export cutoffs	$\varphi_{X,J}$	
Mass of Exporters	ζ_J	$1 - G_J(\varphi_{X,J})$
Prices:		
Wages	w	1
Homogeneous good	p_0	1
Local goods	$p_J(\varphi)$	$\frac{\sigma_J}{\sigma_J - 1} \frac{1}{A\varphi}$
Export goods	$p_{X,J}(\varphi)$	$\tau_J p_J(\varphi)$
Industry goods	P_J	$(M_J p_J(\bar{\varphi}_J)^{1-\sigma_J} + (\zeta_J^{\star} M_J^{\star})(p_{X,J}^{\star}(\bar{\varphi}_{X,J}^{\star}))^{1-\sigma_J})^{1/(1-\sigma_J)}$
Aggregate industry	P_T	$[\sum_J \eta_J P_J^{1-\theta}]^{1/(1-\theta)}$
Aggregate price index	P	$(P_T/a_0)^{a_0}(1/(1-a_0))^{1-a_0}$
Cash-Flows and Asset Prices:		
Profits	$\pi_{D,J}(\varphi)$	$\frac{1}{\sigma_J}(p_J(\varphi))^{1-\sigma_J} \; P_J^{\sigma_J} C_J$
	$\pi_{X,J}(\varphi)$	$\frac{1}{\sigma_J}(p_{X,J}(\varphi))^{1-\sigma_J} \; (P_J^{\star})^{\sigma_J} \; C_J^{\star} \; - f_J/A$
Valuations	$v_{J,t}(\varphi)$	$\beta \mathbf{E}_t S_{t,t+1}(v_{J,t+1}(\varphi) + \pi_{D,J,t+1}(\varphi) + \pi_{X,J,t+1}(\varphi))$

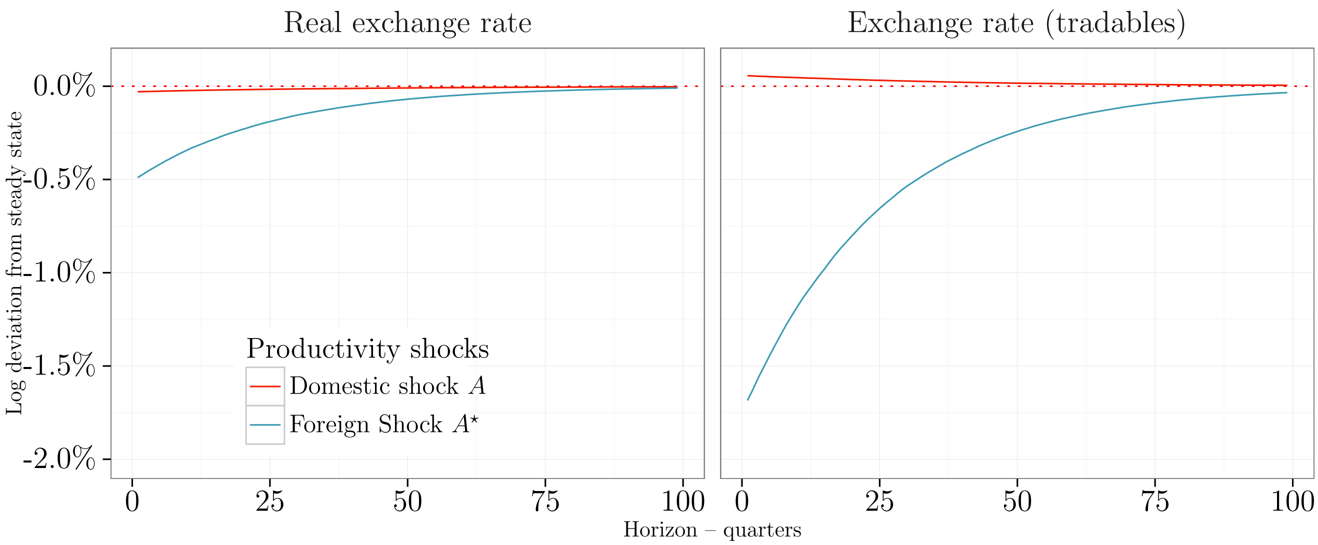
Figure A.1

Impulse response – Shock to A



We plot the Impulse Response Function to a shock ε^A from 500 model simulations. Quantities are log-deviation from their non-stochastic steady-state values. Domestic consumption and foreign consumption are C_t and $C_t^\star$ in the model, respectively. Import penetration is $\mathcal{I}_J$, the fraction of exporters is ζ_J and domestic profits is $\pi_{D,J}$. Red lines correspond to industries with low trade costs that are more exposed to foreign competition. Blue lines are industries with higher trade costs.

Figure A.2
Impulse response – Exchange rates

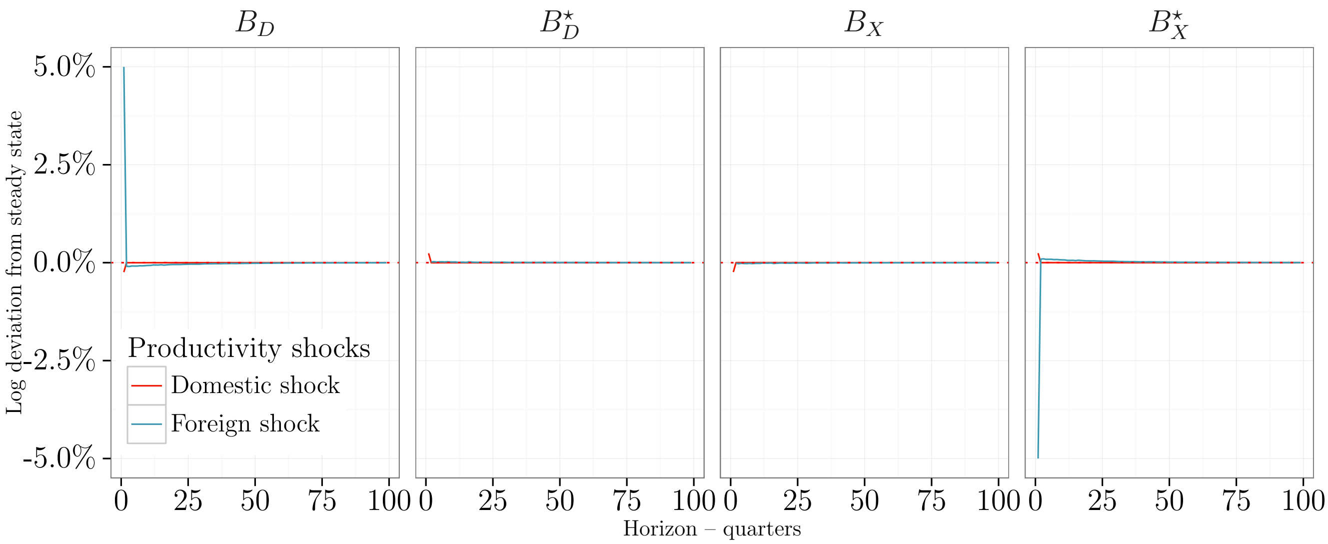


We plot the Impulse Response Function to both a shock ε^{A} and $\varepsilon^{A^\star}$ from 500 model simulations. Quantities are log-deviation from their non-stochastic steady-state values. Real exchange rate and tradable exchange rates are $P^\star/P$ and $P^\star_T/P_T$ in the model, respectively. We only represent the economy where there is no risk-sharing ($\Xi = 0$). The IRF in the case with risk-sharing is very similar: the response of exchange rates to foreign productivity shocks is only slightly dampened, by less than than 0.05% on impact.

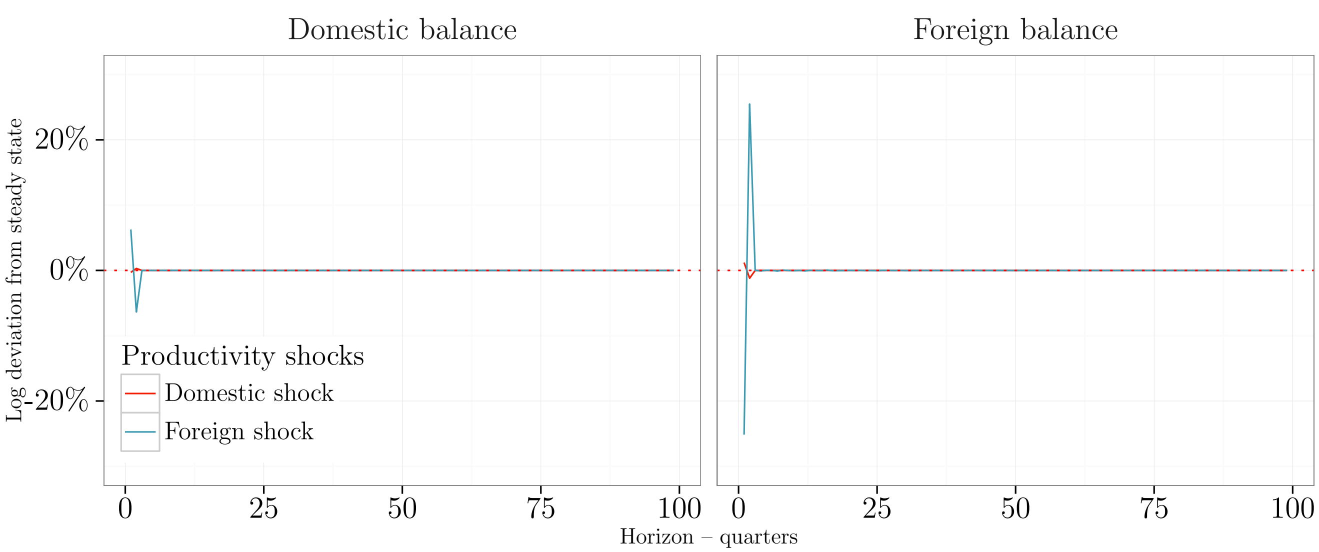
Figure A.3

Impulse response – Bonds and current accounts

(a) Demand for bonds



(b) Current accounts



We plot the Impulse Response Function to a shock ε^A from 500 model simulations. Quantities are log-deviation from their non-stochastic steady-state values. The top panel (Figure A.3a) represents the demand for bonds for domestic households (B_D and B_X) and for foreign households ($B_D^\star$ and $B_X^\star$). The bottom panel (Figure A.3b) represents current accounts as defined in Appendix A.3.3.

B Robustness tables

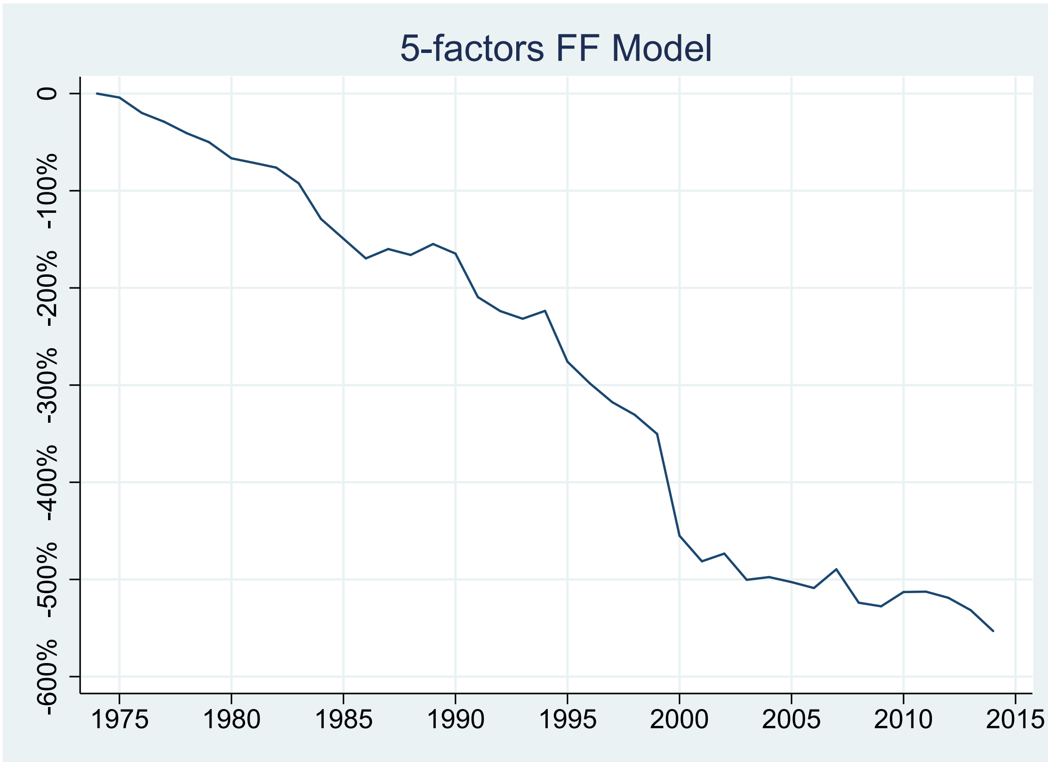


Figure B.4

Calendar-time cumulative abnormal returns of the Hi-Lo Shipping Costs portfolio. *Notes.* Abnormal returns are computed after estimating a time-series regression over the sample period of the Hi-Lo portfolio excess return on the Fama-French five factors (the market portfolio minus the risk-free rate, the size factor, and the value factor, the profitability factor, and the investment factor). We plot the cumulative sum of these abnormal returns.

Table B.1
Distribution of shipping costs across industries

This table presents the average shipping costs in our sample at the 2-digit SIC codes industry level of aggregation. Shipping costs are measured as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports.

2-digit SIC code	Description	Shipping costs
37	Transportation Equipment	0.016
38	Instruments & Related Products	0.017
36	Electronic & Other Electric Equipment	0.021
21	Tobacco Products	0.021
35	Industrial Machinery & Equipment	0.024
28	Chemical & Allied Products	0.026
39	Miscellaneous Manufacturing Industries	0.035
33	Primary Metal Industries	0.035
34	Fabricated Metal Products	0.042
29	Petroleum & Coal Products	0.044
23	Apparel & Other Textile Products	0.045
31	Leather & Leather Products	0.048
27	Printing & Publishing	0.049
22	Textile Mill Product	0.051
20	Food & Kindred Products	0.054
26	Paper & Allied Products	0.054
30	Rubber & Miscellaneous Plastics Products	0.056
24	Lumber & Wood Products	0.068
32	Stone, Clay, & Glass Products	0.102
25	Furniture & Fixtures	0.103

Table B.2
Shipping costs and chinese import penetration – Industry level

This table presents industry-level cross-sectional regressions assessing the effect of shipping costs on the change in U.S. imports from China, U.S. exports to China, U.S. net imports from China, and U.S. employment, output and value added between 2000 to 2007. Imports and exports are normalized by U.S. output plus imports. Controls are obtained from the NBER-CES files and measured in 1999. Regressions are weighted by the industry share in total U.S. expenditures. Robust standard errors are reported in parentheses. *, ** and *** means statistically different from zero at 10%, 5% and 1% level of significance.

	$\Delta_{2000-07}$					
	Imports (China) / Output+Imports	Exports (China) / Output+Imports	Net imports (China) / Output+Imports	Log Employment	Log Output	Log Value added
SC	-0.365***	-0.030	-0.334**	2.520***	2.930***	2.957***
	(0.136)	(0.019)	(0.139)	(0.681)	(0.801)	(0.949)
$\Delta_{1992,99}$ Imports (from China)	0.408**					
	(0.194)					
$\Delta_{1992,99}$ Exports (to China)		1.341***				
		(0.442)				
$\Delta_{1992,99}$ Net imports			0.420**			
			(0.195)			
$\Delta_{1992,99}$ log employment				0.331***		
				(0.097)		
$\Delta_{1992,99}$ log shipments					0.016	
					(0.096)	
$\Delta_{1992,99}$ log value added						-0.051
						(0.103)
Tariff	0.449***	-0.003	0.456***	-2.643***	-4.711***	-4.076***
	(0.161)	(0.009)	(0.164)	(0.622)	(0.902)	(0.827)
Log employment	0.000	0.001	-0.001	-0.006	-0.002	-0.027
	(0.009)	(0.001)	(0.010)	(0.038)	(0.045)	(0.052)
Log value added	0.003	0.002	0.001	-0.111	-0.194**	-0.207*
	(0.011)	(0.002)	(0.010)	(0.079)	(0.095)	(0.109)
Log shipments	-0.010	-0.003	-0.007	0.182***	0.181**	0.222**
	(0.012)	(0.002)	(0.012)	(0.068)	(0.089)	(0.100)
Total factor productivity	0.127***	0.003	0.123***	-0.617***	-0.476***	-0.367**
	(0.032)	(0.004)	(0.033)	(0.158)	(0.172)	(0.177)
5-factor TFP annual growth rate	-0.041	0.037	-0.084	-0.335	-0.115	0.085
	(0.114)	(0.030)	(0.144)	(0.258)	(0.477)	(0.389)
Observations	362	361	361	362	362	362
R^2	0.322	0.363	0.269	0.473	0.288	0.213

Table B.3
Tariff changes, shipping costs and trade flows

This table presents the result of panel regressions assessing the effect of tariff cuts on trade flows, conditional on the level of shipping costs (SC). SC are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. High (low) SC industries are those in the top (bottom) quintile of the distribution of SC in any given year. Tariffs are measured at the industry-year level as the ratio of customs duties to the Free-on-Board value of imports. Imports, Exports and Net Imports are measured at the industry-year level and normalized by the sum of total shipments and imports. Tariff change is the difference in tariffs with respect to the previous year. Large tariff change is a variable equal to the tariff change if it is larger than twice the median absolute tariff change in the sample, and zero otherwise. All regressions include controls for the industry level of tariffs, level of import penetration, log employment, log value added and log output. Standard errors are clustered at the industry level and reported in parentheses. *, ** and *** means statistically different from zero at 10%, 5% and 1% level of significance. The sample period is from 1974 to 2006.

	Delta (t+1, t+6)			
	Imports	Net imports (Imp-Exp)	Imports	Net imports (Imp-Exp)
Tariff change x High SC	0.134	0.087		
	(0.145)	(0.166)		
Tariff change x Low SC	-0.635***	-0.450*		
	(0.169)	(0.246)		
Large tariff change x High SC			0.134	0.087
			(0.145)	(0.166)
Large tariff change x Low SC			-0.635***	-0.450*
			(0.169)	(0.246)
High SC	0.005	-0.006	0.005	-0.006
	(0.017)	(0.021)	(0.017)	(0.021)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	4206	4206	4206	4206
R^2	0.378	0.282	0.378	0.282
Difference High vs Low	0.769***	0.536**	0.769***	0.536**
	(0.193)	(0.253)	(0.193)	(0.253)

Table B.4
Tariff changes, shipping costs and industry cash-flows

This table presents the result of panel regressions assessing the effect of tariff cuts on various sectoral outcomes, conditional on the level of shipping costs (SC). SC are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. High (low) SC industries are those in the top (bottom) quintile of the distribution of SC in any given year. Tariffs are measured at the industry-year level as the ratio of customs duties to the Free-on-Board value of imports. Import penetration is measured at the industry-year level as the ratio of the Free-on-Board value of imports and the sum of total shipments and imports. Tariff change is the difference in tariffs with respect to the previous year. Large tariff change is a variable equal to the tariff change if it is larger than twice the median absolute tariff change in the sample, and zero otherwise. All regressions include control for the industry level of tariffs, level of import penetration, log employment, log value added and log output. Standard errors are clustered at the industry level and reported in parentheses. *, ** and *** means statistically different from zero at 10%, 5% and 1% level of significance. The sample period is from 1974 to 2006.

	Delta (t+1, t+6)					
	Log employment	Log output	Log value added	Log employment	Log output	Log value added
Tariff change x High SC	-0.435	-0.320	0.097			
	(0.641)	(0.492)	(0.795)			
Tariff change x Low SC	1.165***	2.558***	3.008***			
	(0.364)	(0.724)	(0.820)			
Large tariff change x High SC				-0.435	-0.320	0.097
				(0.641)	(0.492)	(0.795)
Large tariff change x Low SC				1.165***	2.558***	3.008***
				(0.364)	(0.724)	(0.820)
High SC	-0.016	-0.008	-0.071	-0.016	-0.008	-0.071
	(0.033)	(0.033)	(0.055)	(0.033)	(0.033)	(0.055)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4206	4206	4206	4206	4206	4206
R^2	0.503	0.496	0.438	0.503	0.496	0.438
Difference High vs Low	-1.600**	-2.878***	-2.911***	-1.581**	-2.891***	-2.892***
	(0.729)	(0.718)	(0.937)	(0.725)	(0.713)	(0.936)

Table B.5
Tariff changes, shipping costs and industry returns

This table presents the result of panel regressions assessing the effect of tariff changes on the average monthly return in any given year and industry, conditional on the level of shipping costs. SC are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. High (low) SC industries are those in the top (bottom) quintile of the distribution of SC in any given year. Tariffs are measured at the industry-year level as the ratio of customs duties to the Free-on-Board value of imports. Import penetration is measured at the industry-year level as the ratio of the Free-on-Board value of imports and the sum of total shipments and imports. Tariff change is the difference in tariffs with respect to the previous year. Large tariff change is a variable equal to the tariff change if it is larger than twice the median absolute tariff change in the sample, and zero otherwise. All regressions include control for the industry level of tariffs, level of import penetration, log employment, log value added and log output. Standard errors are clustered at the industry level and reported in parentheses. *, ** and *** means statistically different from zero at 10%, 5% and 1% level of significance. The sample period is from 1974 to 2006.

	Average monthly industry returns in years			
	[t-1,t+2]	[t,t+2]	[t-1,t+2]	[t,t+2]
Tariff change x High SC	-1.037	-5.273		
	(5.618)	(4.517)		
Tariff change x Low SC	14.076***	8.121**		
	(4.554)	(3.212)		
Large tariff change x High SC			-1.037	-5.273
			(5.618)	(4.517)
Large tariff change x Low SC			14.076***	8.121**
			(4.554)	(3.212)
High SC	0.149	0.217	0.149	0.217
	(0.201)	(0.131)	(0.201)	(0.131)
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	1532	1553	1532	1553
R^2	0.308	0.316	0.308	0.316
Difference	-15.112**	-13.395***	-15.381**	-13.552***
	(6.836)	(4.773)	(6.920)	(4.765)

Table B.6
Shipping costs and tariff portfolios - Returns

This table presents monthly excess returns (α) over a five-factor Fama-French model of shipping costs plus tariffs portfolios. Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Tariffs are measured at the industry-year level as the ratio of customs duties to the Free-on-Board value of imports. In any given month, stocks are sorted into five portfolios based on the sum of their industry shipping costs and tariffs in the previous year. We regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), and the value factor (high minus low), the profitability factor (robust minus weak), and the investment factor (conservative minus aggressive) all obtained from Kenneth French's website. Monthly portfolios returns are either equally-weighted or value-weighted. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is from 1975 to 2015.

	Shipping costs+tariff portfolios - Equally weighted					
	Low	2	3	4	High	Hi-Lo
α	9.581***	2.057	1.759	-2.053	-4.102***	-13.683***
	(2.550)	(1.630)	(1.435)	(1.498)	(1.468)	(3.277)
β^{MKT}	1.023***	1.054***	1.026***	1.144***	1.099***	0.077
	(0.036)	(0.027)	(0.026)	(0.038)	(0.034)	(0.057)
β^{HML}	-0.499***	-0.259***	-0.235***	0.119	0.493***	0.991***
	(0.081)	(0.075)	(0.056)	(0.103)	(0.103)	(0.155)
β^{SMB}	0.865***	1.011***	0.901***	0.853***	0.773***	-0.091
	(0.066)	(0.063)	(0.053)	(0.071)	(0.057)	(0.095)
β^{RMW}	-0.922***	-0.568***	-0.369***	-0.081	0.242***	1.164***
	(0.110)	(0.069)	(0.074)	(0.109)	(0.090)	(0.165)
β^{CMA}	0.189	-0.063	0.047	-0.008	-0.078	-0.267
	(0.160)	(0.138)	(0.109)	(0.156)	(0.109)	(0.225)

	Shipping cost+tariff portfolios - Value weighted					
	Low	2	3	4	High	Hi-Lo
α	2.838*	1.784	2.902*	-0.256	-1.443	-4.280*
	(1.551)	(1.430)	(1.635)	(1.352)	(1.237)	(2.197)
β^{MKT}	0.926***	1.013***	1.030***	1.076***	1.011***	0.085
	(0.049)	(0.038)	(0.023)	(0.044)	(0.024)	(0.052)
β^{HML}	-0.310***	-0.299***	-0.255***	-0.177*	0.217***	0.527***
	(0.086)	(0.070)	(0.065)	(0.102)	(0.065)	(0.129)
β^{SMB}	-0.140**	0.058	0.091	0.060	0.104***	0.245***
	(0.064)	(0.057)	(0.077)	(0.067)	(0.039)	(0.081)
β^{RMW}	-0.032	-0.324***	-0.507***	-0.115	0.448***	0.480***
	(0.087)	(0.087)	(0.112)	(0.096)	(0.058)	(0.117)
β^{CMA}	0.199	-0.182	-0.097	0.348**	0.148*	-0.051
	(0.147)	(0.129)	(0.109)	(0.165)	(0.087)	(0.158)

Table B.7
Weight-to-value portfolios returns - Robustness

This table presents monthly excess returns (α) over a five-factor Fama-French model of weight-to-value ratio portfolios. Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Weight-to-value is measured in Panel A at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports, for all trade involving U.S. exports. Weight-to-value is measured in Panel B at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports, for all imports and exports not involving the U.S. on either side of the trade. In any given month, stocks are sorted into five portfolios based on their industry weight-to-value ratio in the previous year. In any given month, stocks are sorted into five portfolios based on the weight-to-value ratio of their industry in the previous year. We regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), and the value factor (high minus low), the profitability factor (robust minus weak), and the investment factor (conservative minus aggressive) all obtained from Kenneth French's website. Monthly portfolios returns are either equally-weighted or value-weighted. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is from 1975 to 2015.

Panel A: Weight-to-value portfolios (using U.S. exports)

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	6.702**	8.338***	4.455	-3.024*	-2.743	-9.445**	4.854**	4.694**	0.579	-3.112**	-0.106	-4.959*
	(3.374)	(2.973)	(2.835)	(1.784)	(1.987)	(3.988)	(2.370)	(1.948)	(2.091)	(1.514)	(1.371)	(2.992)
β^{MKT}	1.201***	1.006***	0.921***	1.097***	1.130***	-0.071	1.166***	0.908***	0.997***	1.105***	0.873***	-0.292***
	(0.061)	(0.049)	(0.043)	(0.040)	(0.049)	(0.083)	(0.064)	(0.063)	(0.063)	(0.038)	(0.031)	(0.077)
β^{HML}	-0.414***	-0.560***	-0.354***	0.443***	0.650***	1.064***	-0.527***	-0.685***	-0.291**	0.253***	0.274**	0.801***
	(0.115)	(0.091)	(0.081)	(0.110)	(0.088)	(0.105)	(0.099)	(0.074)	(0.117)	(0.093)	(0.111)	(0.163)
β^{SMB}	0.887***	0.993***	0.982***	0.729***	0.645***	-0.242**	0.117	0.134	-0.089	0.181***	-0.037	-0.154
	(0.109)	(0.095)	(0.071)	(0.082)	(0.047)	(0.099)	(0.079)	(0.087)	(0.087)	(0.054)	(0.056)	(0.108)
β^{RMW}	-0.749***	-0.781***	-0.521***	-0.098	0.190***	0.939***	-0.367***	-0.348***	0.346**	0.122	0.195***	0.562***
	(0.129)	(0.142)	(0.122)	(0.090)	(0.065)	(0.131)	(0.098)	(0.094)	(0.137)	(0.082)	(0.062)	(0.120)
β^{CMA}	-0.074	0.149	0.203	-0.139	-0.090	-0.017	-0.158	-0.043	0.508**	0.042	0.165	0.323
	(0.219)	(0.145)	(0.160)	(0.156)	(0.125)	(0.195)	(0.201)	(0.127)	(0.244)	(0.107)	(0.117)	(0.260)

Panel B: Weight-to-value portfolios (using non-U.S. data)

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	5.840***	3.502*	3.515**	-2.470*	-3.480**	-9.320***	5.742***	1.386	1.073	-3.043**	-0.444	-6.186**
	(2.165)	(1.836)	(1.780)	(1.386)	(1.359)	(2.568)	(1.763)	(1.486)	(1.600)	(1.351)	(1.329)	(2.435)
β^{MKT}	1.167***	1.011***	1.018***	1.109***	1.093***	-0.074	1.149***	0.953***	0.995***	1.124***	0.916***	-0.233***
	(0.055)	(0.025)	(0.026)	(0.032)	(0.033)	(0.062)	(0.047)	(0.044)	(0.031)	(0.023)	(0.036)	(0.068)
β^{HML}	-0.499***	-0.520***	-0.272***	0.285***	0.481***	0.980***	-0.560***	-0.593***	-0.154*	0.146**	0.107	0.666***
	(0.128)	(0.061)	(0.054)	(0.094)	(0.083)	(0.106)	(0.107)	(0.071)	(0.090)	(0.065)	(0.095)	(0.165)
β^{SMB}	0.965***	1.057***	0.973***	0.849***	0.683***	-0.282***	0.167**	0.218***	-0.086	0.211***	-0.096*	-0.263**
	(0.104)	(0.056)	(0.049)	(0.059)	(0.042)	(0.087)	(0.079)	(0.081)	(0.065)	(0.042)	(0.050)	(0.110)
β^{RMW}	-0.745***	-0.603***	-0.484***	0.003	0.200***	0.945***	-0.339***	-0.377***	0.290***	0.125**	0.250***	0.589***
	(0.169)	(0.079)	(0.070)	(0.088)	(0.075)	(0.146)	(0.101)	(0.093)	(0.085)	(0.060)	(0.067)	(0.138)
β^{CMA}	-0.093	0.163	0.130	-0.031	-0.038	0.054	-0.178	-0.047	0.467***	0.077	0.267**	0.445*
	(0.195)	(0.129)	(0.127)	(0.135)	(0.091)	(0.177)	(0.178)	(0.129)	(0.178)	(0.095)	(0.129)	(0.263)

Table B.8

Shipping cost portfolios - Returns and currency factors

This table presents abnormal equally-weighted excess returns (α) over four-factor models based on the U.S. market portfolio minus the risk-free rate, the size factor (small minus big), and the value factor (high minus low), and respectively three different currency factors. We use the dollar factor from Verdelhan (Forthcoming) in panel A, the carry factor from Verdelhan (Forthcoming) in panel B, and the excess return of high interest rates currencies minus low interest rate currencies from Lustig et al. (2011) in panel C. Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. In any given month, stocks are sorted into five portfolios based on their industry shipping costs in the previous year. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is from 1983 to 2010 in panel A and B as in Verdelhan (Forthcoming), and from 1983 to 2015 in panel C.

Panel A: Controlling for Dollar Factor

	Shipping costs portfolios						Weight-to-value portfolios					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	6.275*	-0.107	-1.020	-1.466	-3.946**	-10.221**	6.909	2.654	0.277	-1.956	-3.957**	-10.866**
	(3.671)	(2.477)	(2.063)	(1.589)	(1.706)	(4.774)	(4.502)	(2.905)	(2.541)	(1.870)	(1.866)	(5.481)

Panel B: Controlling for Carry Factor

	Shipping costs portfolios						Weight-to-value portfolios					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	6.367*	0.178	-0.600	-1.072	-3.490**	-9.858**	7.255	3.197	0.791	-1.561	-3.705*	-10.960*
	(3.761)	(2.409)	(2.036)	(1.591)	(1.729)	(4.922)	(4.662)	(2.888)	(2.566)	(1.933)	(1.928)	(5.729)

Panel C: Controlling for Currency Factor

	Shipping costs portfolios						Weight-to-value portfolios					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
α	6.774**	-0.944	-1.615	-2.447*	-3.717**	-10.491**	6.989*	0.905	-0.853	-3.164*	-3.168*	-10.157**
	(3.153)	(2.253)	(1.737)	(1.472)	(1.552)	(4.101)	(3.721)	(2.591)	(2.126)	(1.650)	(1.749)	(4.606)

Table B.9
Shipping cost portfolios - Alternative sample periods

This table presents excess returns (α) over a five-factor Fama-French model of shipping costs portfolios. Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. In any given month, stocks are sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year. We regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), the value factor (high minus low), the profitability factor (robust minus weak), and the investment factor (conservative minus aggressive) all obtained from Kenneth French's website. Portfolios returns are either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12). Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively.

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Extended sample 1963-2015	7.184***	0.855	1.075	-0.120	-4.493***	-11.677***	3.949***	-0.172	0.725	1.267	-1.942*	-5.891***
	(2.036)	(1.349)	(1.312)	(1.346)	(1.215)	(2.643)	(1.356)	(1.466)	(1.370)	(1.363)	(1.146)	(1.844)
Subsample 1975-1994	6.390***	0.113	-1.008	-1.656*	-2.515**	-8.905***	2.059	1.810	-4.099*	0.672	-2.010	-4.069
	(2.269)	(1.878)	(1.801)	(0.996)	(1.233)	(3.083)	(1.971)	(2.183)	(2.168)	(2.336)	(1.676)	(2.564)
Subsample 1995-2015	11.393**	2.160	2.871	-1.232	-3.270*	-14.663***	6.248**	-0.282	0.903	-1.481	0.687	-5.561
	(4.747)	(3.179)	(3.027)	(2.503)	(1.798)	(5.204)	(2.483)	(2.341)	(2.674)	(2.015)	(1.690)	(3.457)

Table B.10
Shipping cost portfolios and weight-to-value portfolios - Controlling for momentum and liquidity factor

This table presents excess returns (α) over a sixth-factor Fama-French model of either shipping costs portfolios (Panel A) or weight-to-value portfolios (Panel B). Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. In any given month, stocks are sorted into five portfolios based on the sum of their industry shipping costs and tariffs in the previous year. We regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor, the value factor, the profitability factor, the investment factor, all obtained from Kenneth French's website, and either the momentum factor also obtained from Kenneth French's website or the liquidity factor of Pastor and Stambaugh (2003) obtained from Lubos Pástor's website. Portfolios returns are either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12). Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Panel A, and 1990-2015 in Panel B.

	Panel A: Shipping costs portfolios											
	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
5FF + Momentum	10.533***	1.851	2.274	0.413	-2.687**	-13.220***	4.700***	0.096	1.545	0.221	-0.996	-5.696***
	(2.352)	(1.693)	(1.510)	(1.235)	(1.084)	(2.907)	(1.735)	(1.738)	(1.506)	(1.440)	(1.176)	(2.095)
5FF + Liquidity factor	10.210***	1.247	1.201	-1.361	-4.295***	-14.505***	4.771***	0.372	0.675	-0.422	-1.604	-6.376***
	(2.352)	(1.715)	(1.619)	(1.428)	(1.364)	(3.041)	(1.605)	(1.668)	(1.630)	(1.581)	(1.128)	(2.023)
	Panel B: Weight-to-value portfolios											
	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
5FF + Momentum	12.234***	5.928**	4.371*	-0.243	-1.734	-13.968***	4.235**	5.653***	2.307	-2.123	-0.054	-4.289
	(3.448)	(2.741)	(2.246)	(1.612)	(1.509)	(4.147)	(1.935)	(2.000)	(1.687)	(1.463)	(1.393)	(2.739)
5FF + Liquidity factor	11.914***	4.922*	2.812	-2.358	-3.622**	-15.536***	5.464***	5.158**	1.496	-2.940*	-0.710	-6.174***
	(3.489)	(2.758)	(2.360)	(1.890)	(1.707)	(4.146)	(1.759)	(2.072)	(1.751)	(1.554)	(1.252)	(2.354)

Table B.11
Analysts' forecast errors - Stocks in the Low and High SC and WV quintiles only

This table reports the coefficients from panel regressions of either the actual I/B/E/S annual earnings per share (EPS) (columns 1, 4, 7 and 10), the mean I/B/E/S consensus forecast of annual EPS (columns 2, 5, 8 and 11), or the forecast error (actual I/B/E/S annual EPS minus mean I/B/E/S consensus forecast of annual EPS; columns 3, 6, 9 and 12), all normalized by the stock price at the end of the last fiscal year, on either shipping costs or the logarithm of the weight-to-value ratio, and control variables. The consensus forecast is measured as the average of the last forecast of each analyst covering the stock in the 8 months before the end of the fiscal year. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. High SC (High WV) is a dummy that takes the value of 1 if the stock belongs to the top quintile of the distribution of SC (respectively Weight-to-value) in any given year. The sample is restricted to stocks that belong to the bottom and top quintiles of the distribution of SC in any given year in columns 1 to 6, and to stocks that belong to the bottom and top quintiles of the distribution of SC in any given year in columns 7 to 12. BETA for a stock in a given month is the beta of the stock monthly returns with the US stock market return estimated using monthly data over the past 60 months. LN(ME) is the logarithm of firm market capitalization in the previous month. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO×item PRCC_F) at the end of fiscal year t-2. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT) at the end of fiscal year t-2. MARKET LEV is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity at the end of fiscal year t-2. We remove observations for which the the forecast error is below the 1st and above the 99th percentiles of its empirical distribution. Standard errors are clustered at the 4-digit industry level. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1982-2015.

	Stocks in the Low and High SC Quintiles Only						Stocks in the Low and High WV Quintiles Only					
	Actual	Forecast	Error	Actual	Forecast	Error	Actual	Forecast	Error	Actual	Forecast	Error
High SC	0.085***	0.085***	-0.000	0.069***	0.068***	0.001						
	(0.021)	(0.021)	(0.001)	(0.016)	(0.017)	(0.001)						
High WV							0.087***	0.087***	-0.000	0.067***	0.066***	0.001
							(0.024)	(0.024)	(0.001)	(0.018)	(0.018)	(0.001)
BETA				-0.008	-0.008	-0.000				-0.003	-0.004	0.000
				(0.007)	(0.007)	(0.001)				(0.007)	(0.007)	(0.001)
LN(ME)				0.022***	0.021***	0.002***				0.025***	0.023***	0.001***
				(0.006)	(0.006)	(0.000)				(0.006)	(0.006)	(0.000)
BEME				-0.003	0.000	-0.003**				0.014*	0.018**	-0.003**
				(0.013)	(0.013)	(0.001)				(0.008)	(0.008)	(0.001)
MARKET LEV				0.018	0.025	-0.007**				0.003	0.009	-0.006*
				(0.021)	(0.021)	(0.003)				(0.018)	(0.018)	(0.003)
I/K				-0.036***	-0.034***	-0.003				-0.019*	-0.018	-0.001
				(0.013)	(0.012)	(0.002)				(0.012)	(0.011)	(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	9379	9379	9379	9379	9379	9379	8562	8562	8562	8562	8562	8562
R^2	0.085	0.094	0.022	0.137	0.140	0.045	0.087	0.094	0.015	0.143	0.147	0.032

Table B.12
Analysts' forecast errors - 2-year ahead earnings

This table reports the coefficients from panel regressions of either the actual I/B/E/S annual earnings per share (EPS) (columns 1, 4, 7 and 10), the mean I/B/E/S consensus forecast of annual EPS (columns 2, 5, 8 and 11), or the forecast error (actual I/B/E/S annual EPS minus mean I/B/E/S consensus forecast of annual EPS; columns 3, 6, 9 and 12), all normalized by the stock price at the end of the last fiscal year, on either shipping costs or the logarithm of the weight-to-value ratio, and control variables. The consensus forecast is measured as the average of the last forecast of each analyst covering the stock from 1 year and 8 months to 1 year before the end of the fiscal year (being forecasted). Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. High SC (High WV) is a dummy that takes the value of 1 if the stock belongs to the top quintile of the distribution of SC (respectively Weight-to-value) in any given year. The sample is restricted to stocks that belong to the bottom and top quintiles of the distribution of SC in any given year in columns 1 to 6, and to stocks that belong to the bottom and top quintiles of the distribution of SC in any given year in columns 7 to 12. We remove observations for which the the forecast error is below the 1st and above the 99th percentiles of its empirical distribution. Standard errors are clustered at the 4-digit industry level. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1980-2015.

	All Stocks			Low and High SC Only			All Stocks			Low and High WV Only		
	Actual	Forecast	Error	Actual	Forecast	Error	Actual	Forecast	Error	Actual	Forecast	Error
SC	0.316*	0.358*	-0.042									
	(0.181)	(0.186)	(0.048)									
High SC				0.064***	0.067***	-0.002						
				(0.014)	(0.015)	(0.003)						
Log WV							0.010**	0.011**	-0.001*			
							(0.004)	(0.005)	(0.001)			
High WV										0.061***	0.064***	-0.003
										(0.015)	(0.017)	(0.003)
BETA	-0.016***	-0.004*	-0.013***	-0.010*	0.000	-0.010***	-0.014***	-0.003	-0.012***	-0.005	0.004	-0.009***
	(0.002)	(0.002)	(0.002)	(0.006)	(0.008)	(0.003)	(0.003)	(0.003)	(0.002)	(0.006)	(0.007)	(0.003)
LN(ME)	0.019***	0.007**	0.011***	0.021***	0.012*	0.010***	0.019***	0.008**	0.011***	0.022***	0.013*	0.009***
	(0.003)	(0.003)	(0.001)	(0.005)	(0.006)	(0.002)	(0.003)	(0.004)	(0.001)	(0.005)	(0.007)	(0.002)
BEME	0.016**	0.018**	-0.002	0.008	0.012**	-0.004	0.016**	0.017***	-0.002	0.017**	0.021***	-0.004
	(0.007)	(0.007)	(0.002)	(0.007)	(0.006)	(0.003)	(0.006)	(0.006)	(0.002)	(0.007)	(0.005)	(0.004)
MARKET LEV	0.026**	0.064***	-0.038***	0.022	0.062***	-0.039***	0.008	0.040***	-0.032***	0.009	0.043***	-0.035***
	(0.011)	(0.010)	(0.005)	(0.018)	(0.015)	(0.009)	(0.012)	(0.011)	(0.006)	(0.017)	(0.016)	(0.008)
I/K	-0.044***	-0.036***	-0.008**	-0.034***	-0.031***	-0.002	-0.035***	-0.027***	-0.008**	-0.027***	-0.025***	-0.002
	(0.008)	(0.007)	(0.003)	(0.008)	(0.009)	(0.005)	(0.009)	(0.009)	(0.004)	(0.007)	(0.008)	(0.004)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21535	21535	21535	8814	8814	8814	19384	19384	19384	8182	8182	8182
R^2	0.176	0.164	0.129	0.272	0.283	0.115	0.191	0.182	0.127	0.254	0.262	0.113

Table B.13
Analysts' forecast errors - Alternative measures of FE

This table reports the coefficients from panel regressions of the forecast error, on either shipping costs or the logarithm of the weight-to-value ratio, and control variables. The consensus forecast is measured as the average (respectively median) of the last forecast of each analyst covering the stock in the 8 months before the end of the fiscal year in Columns 1 to 4 (respectively Columns 5 to 12). The forecast error (actual minus consensus) is normalized by the stock price at the end of the last fiscal year in Columns 5 to 8, and by total asset at the end of the last fiscal year in Columns 1 to 4 and 9 to 12. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. BETA for a stock in a given month is the beta of the stock monthly returns with the US stock market return estimated using monthly data over the past 60 months. LN(ME) is the logarithm of firm market capitalization in the previous month. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO$\times$ item PRCC_F) at the end of fiscal year t-2. Return on assets (ROA) is defined as operating income after depreciation and amortization (item OIBDP-item DP) divided by total assets at the end of fiscal year t-2. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT) at the end of fiscal year t-2. MARKET LEV is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity at the end of fiscal year t-2. We remove observations for which the the forecast error is below the 1st and above the 99th percentiles of its empirical distribution. Standard errors are clustered at the 4-digit industry level. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1982-2015.

	Mean FE/Asset(-1)				Median FE/Prc(-1)				Median FE/Asset(-1)			
SC	0.006				0.010				0.007			
	(0.009)				(0.010)				(0.008)			
High SC		0.000				0.000				0.000		
		(0.000)				(0.000)				(0.000)		
Log Weight-to-value			-0.000				-0.000				-0.000	
			(0.000)				(0.000)				(0.000)	
High WV				-0.000				0.000				-0.000
				(0.000)				(0.000)				(0.000)
BETA	-0.001**	-0.001**	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.000	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LN(ME)	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BEME	0.002***	0.002***	0.002***	0.002***	-0.002*	-0.002**	-0.001	-0.001	0.002**	0.002***	0.002**	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
MARKET LEV	0.002	0.002	0.002	0.002	-0.007***	-0.007***	-0.006***	-0.006***	0.002*	0.002*	0.003*	0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
I/K	-0.003**	-0.003**	-0.002*	-0.002	-0.003**	-0.003**	-0.002**	-0.002**	-0.002**	-0.002**	-0.002**	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22613	22613	20095	20095	22892	22892	20357	20357	22599	22599	20082	20082
R^2	0.030	0.030	0.025	0.025	0.040	0.040	0.034	0.034	0.027	0.027	0.022	0.022

Table B.14
Returns - Fama MacBeth regressions

This table reports the Fama MacBeth coefficients from monthly cross-sectional regressions of individual stock returns on either shipping costs (Columns 1 to 6) or the logarithm of the weight-to-value ratio (Columns 7 to 12), and control variables. Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. $BETA_{USStockMarket}$ for a stock in a given month is the beta of the stock monthly returns with the US stock market return estimated using monthly data over the past 60 months. LN(ME) is the logarithm of firm market capitalization in the previous month. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO×item PRCC_F) at the end of fiscal year t-2. Return on assets (ROA) is defined as operating income after depreciation and amortization (item OIBDP-item DP) divided by total assets at the end of fiscal year t-2. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT) at the end of fiscal year t-2. MARKET LEV is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity at the end of fiscal year t-2. All independent variables are windsorized at the 99th percentile of their empirical distribution. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Columns 1 to 3, and 1990-2015 in Columns 4 to 6.

	RET									
	All stocks	Size(Low)	Size(High)	ROA(Low)	ROA(High)	All stocks	Size(Low)	Size(High)	ROA(Low)	ROA(High)
Shipping costs	-0.722***	-1.720***	-0.438**	-2.196***	-0.256					
	(0.226)	(0.461)	(0.169)	(0.616)	(0.175)					
Log Weight_to_value						-0.023***	-0.036***	-0.014**	-0.044***	-0.012**
						(0.007)	(0.011)	(0.006)	(0.010)	(0.005)
$BETA_{US.Stock.Market}$	-0.002	0.015	-0.026	0.009	-0.014	-0.001	0.010	-0.016	0.010	-0.007
	(0.016)	(0.019)	(0.020)	(0.017)	(0.019)	(0.021)	(0.026)	(0.025)	(0.023)	(0.027)
LN(ME)	-0.008	0.008	-0.013**	-0.012	-0.006	-0.006	-0.017	-0.011	-0.017	-0.002
	(0.006)	(0.018)	(0.006)	(0.010)	(0.006)	(0.008)	(0.023)	(0.008)	(0.015)	(0.007)
BEME	0.034**	0.047***	0.010	0.037***	0.049**	0.036*	0.047**	0.021	0.038*	0.032
	(0.014)	(0.015)	(0.022)	(0.014)	(0.023)	(0.020)	(0.020)	(0.032)	(0.019)	(0.032)
ROA	0.099**	0.119**	0.080	0.104*	-0.115	0.089	0.077	0.052	0.140**	-0.144
	(0.046)	(0.053)	(0.075)	(0.053)	(0.084)	(0.056)	(0.060)	(0.091)	(0.056)	(0.103)
I/K	-0.040*	-0.036	-0.039	-0.036	-0.007	-0.034	-0.002	-0.042	-0.022	-0.013
	(0.024)	(0.037)	(0.044)	(0.029)	(0.042)	(0.031)	(0.040)	(0.060)	(0.033)	(0.055)
MARKET LEV	0.002	-0.022	0.051	0.057	-0.072	0.023	-0.023	0.053	0.085	-0.066
	(0.047)	(0.056)	(0.052)	(0.051)	(0.060)	(0.065)	(0.080)	(0.066)	(0.077)	(0.077)
Observations	439109	136955	157569	158721	139291	314024	102589	108394	116996	98608
R^2	0.050	0.055	0.100	0.057	0.073	0.054	0.054	0.111	0.052	0.077

Table B.15

Returns - Fama Mac-Beth Regressions - Controlling for Gomes et al. (2009) sectors classification

This table reports variants of the Fama Mac-Beth regressions in Table B.14 in which we include as control variables dummies for each industry in Gomes et al. (2009) classification based on their primary contribution to final demand according to the benchmark input-output accounts, namely nondurable sectors, durable sectors, investment sectors and other. Services are absent in our regressions given that our sample is restricted to manufacturing. Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. $\text{BETA}_{USStockMarket}$ for a stock in a given month is the beta of the stock monthly returns with the US stock market return estimated using monthly data over the past 60 months. LN(ME) is the logarithm of firm market capitalization in the previous month. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO×item PRCC_F) at the end of fiscal year t-2. Return on assets (ROA) is defined as operating income after depreciation and amortization (item OIBDP-item DP) divided by total assets at the end of fiscal year t-2. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT) at the end of fiscal year t-2. MARKET LEV is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity at the end of fiscal year t-2. All independent variables are windsorized at the 99th percentile of their empirical distribution. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Columns 1 to 3, and 1990-2015 in Columns 4 to 6.

	RET									
	All stocks	Size(Low)	Size(High)	ROA(Low)	ROA(High)	All stocks	Size(Low)	Size(High)	ROA(Low)	ROA(High)
SC	-0.719***	-1.590***	-0.464***	-2.059***	-0.323*					
	(0.231)	(0.480)	(0.179)	(0.565)	(0.177)					
Log Weight_to_value						-0.021***	-0.030***	-0.013**	-0.043***	-0.011**
						(0.007)	(0.011)	(0.006)	(0.010)	(0.006)
$\text{BETA}_{US.Stock.Market}$	-0.000	0.017	-0.024	0.010	-0.011	-0.000	0.013	-0.017	0.012	-0.005
	(0.015)	(0.018)	(0.019)	(0.016)	(0.019)	(0.021)	(0.026)	(0.024)	(0.022)	(0.026)
LN(ME)	-0.010*	0.007	-0.016**	-0.016	-0.008	-0.008	-0.020	-0.013	-0.019	-0.003
	(0.006)	(0.018)	(0.006)	(0.010)	(0.006)	(0.008)	(0.024)	(0.009)	(0.015)	(0.007)
BEME	0.033**	0.045***	0.008	0.039***	0.046**	0.035*	0.046**	0.018	0.039**	0.032
	(0.013)	(0.014)	(0.021)	(0.014)	(0.023)	(0.019)	(0.019)	(0.031)	(0.019)	(0.033)
ROA	0.109**	0.126**	0.075	0.123**	-0.115	0.099*	0.083	0.065	0.151***	-0.126
	(0.044)	(0.051)	(0.071)	(0.052)	(0.083)	(0.056)	(0.059)	(0.090)	(0.054)	(0.102)
I/K	-0.036	-0.035	-0.034	-0.031	-0.005	-0.028	0.001	-0.029	-0.022	-0.006
	(0.025)	(0.037)	(0.046)	(0.030)	(0.041)	(0.031)	(0.041)	(0.062)	(0.032)	(0.054)
MARKET LEV	0.004	-0.033	0.056	0.057	-0.072	0.022	-0.041	0.062	0.081	-0.062
	(0.045)	(0.054)	(0.048)	(0.050)	(0.058)	(0.063)	(0.077)	(0.061)	(0.072)	(0.074)
Gomes et al. (2009) industry dummies (Durable, non-durable, investment, other)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	439109	136955	157569	158721	139291	314024	102589	108394	116996	98608
R^2	0.057	0.068	0.118	0.070	0.089	0.059	0.063	0.128	0.062	0.090

Table B.16
Exporter Status from 10Ks - Fama MacBeth regressions

This table reports the Fama MacBeth coefficients from monthly cross-sectional regressions of exporter status on either shipping costs or the logarithm of the weight-to-value ratio, and control variables. A firm is considered as an exporter in a given year based on text-based analysis of firm 10-Ks (annual reports). Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. $BETA_{USStockMarket}$ for a stock in a given month is the beta of the stock monthly returns with the US stock market return estimated using monthly data over the past 60 months. LN(ME) is the logarithm of firm market capitalization in the previous month. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO×item PRCC_F) at the end of fiscal year t-2. Return on assets (ROA) is defined as operating income after depreciation and amortization (item OIBDP-item DP) divided by total assets at the end of fiscal year t-2. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT) at the end of fiscal year t-2. MARKET LEV is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity at the end of fiscal year t-2. All independent variables are windsorized at the 99th percentile of their empirical distribution. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1994-2015.

	Exporter (0,1)					
Shipping costs	-1.734***		-2.027***		-2.132***	
	(0.170)		(0.223)		(0.184)	
Log Weight_to_value		-0.002		-0.007**		-0.009***
		(0.002)		(0.003)		(0.002)
$BETA_{US.Stock.Market}$	0.026***	0.031***	0.051***	0.055***	0.028***	0.034***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)
LN(ME)	0.044***	0.042***			0.034***	0.033***
	(0.004)	(0.004)			(0.005)	(0.005)
ROA			0.276***	0.261***	0.201***	0.188***
			(0.017)	(0.016)	(0.021)	(0.021)
MARKET LEV	0.164***	0.113***	0.146***	0.110***	0.148***	0.111***
	(0.027)	(0.025)	(0.024)	(0.023)	(0.026)	(0.025)
I/K	-0.043	-0.025	-0.053	-0.040	-0.025	-0.013
	(0.027)	(0.027)	(0.033)	(0.032)	(0.028)	(0.028)
Observations	22728	22713	22728	22713	22728	22713
R^2	0.056	0.049	0.048	0.040	0.069	0.060

Table B.17
Shipping costs and weight-to-value portfolios - Returns, conditional on exporter status

This table presents equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12) monthly excess returns (α) over a five-factor Fama-French model of either shipping costs portfolios (Panel A) or weight-to-value portfolios (Panel B). Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. In any given month, stocks are independently sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year, and into two portfolios based on their status as an exporter in the previous year. A firm is considered as an exporter in a given year based on text-based analysis of firm 10-Ks (annual reports). We then regress a given portfolio's value-weighted return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), and the value factor (high minus low), the profitability factor (robust minus weak), and the investment factor (conservative minus aggressive) all obtained from Kenneth French's website. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1994-2015.

	Panel A: Shipping cost portfolios											
	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Non-Exporters Only	12.011**	1.208	-2.106	-3.866	-5.653**	-17.663***	8.083**	4.260	-0.480	-0.382	-4.480**	-12.563**
	(4.763)	(4.435)	(3.335)	(2.781)	(2.803)	(5.604)	(3.957)	(3.835)	(4.458)	(2.960)	(1.946)	(5.052)
Exporters Only	13.883***	3.668	5.556*	-0.974	-3.186*	-17.069***	6.469***	-0.499	0.586	-2.169	1.161	-5.308
	(4.646)	(2.886)	(2.886)	(2.511)	(1.741)	(5.203)	(2.161)	(2.211)	(3.087)	(2.251)	(1.964)	(3.389)
Exporters-Non-Exporters						0.595						7.254
						(3.256)						(4.764)

	Panel A: Weight-to-value portfolios											
	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Non-Exporters Only	11.135***	3.140	-1.156	-3.558	-3.946	-15.081***	7.773**	5.473	4.394	-4.916**	0.340	-7.433*
	(3.729)	(3.971)	(2.606)	(2.481)	(2.402)	(4.441)	(3.061)	(3.860)	(2.832)	(2.251)	(2.096)	(4.050)
Exporters Only	12.805***	6.187**	5.333*	-1.360	-2.985	-15.790***	3.119*	5.702***	0.077	-1.763	0.937	-2.182
	(4.603)	(2.955)	(2.949)	(2.306)	(1.843)	(5.258)	(1.888)	(2.185)	(2.389)	(1.877)	(1.976)	(3.308)
Exporters-Non-Exporters						1.274						5.361
						(2.743)						(5.321)

Table B.18
Shipping cost portfolios conditional on US trade elasticities (σ) and Pareto parameter (γ) - Non-exporters only

This table presents equally-weighted excess returns (α) over a five-factor Fama-French model of either shipping costs portfolios (Panel A) or weight-to-value portfolios (Panel B). Monthly returns are multiplied by 12 so as to make the magnitude comparable to annualized returns. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. The sample is restricted to non-exporters based on their status as an exporter in the previous year. A firm is considered as an exporter in a given year based on text-based analysis of firm 10-Ks (annual reports). In any given month, stocks are independently sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year, and into two portfolios based on either their industry US trade elasticities (σ), or their industry Pareto tail parameter (γ) in the previous year. US trade elasticities are estimated by Broda and Weinstein (2006) from 1990 to 2001 at the commodity level, and aggregated at the four-digit SIC based on total imports over 1990-2001. We estimate the Pareto parameter separately for each industry-year as the estimated coefficient γ of the following OLS regression: $ln(SIZE) = -\gamma ln(Rank) + constant$, where for each year and 4-digit industries, firms are ranked in descending order according to their total firm market value (Compustat item CSHO $\times$ PRCC_F+AT-CEQ). Stocks at the intersection of the two sorts are grouped together to form portfolios based on either shipping costs (Columns 1 to 6), or weight-to-value (Columns 7 to 12) and the Pareto tail parameter. We then regress a given portfolio's return in excess of the risk free rate on the market portfolio minus the risk-free rate, the size factor (small minus big), and the value factor (high minus low), all obtained from Kenneth French's website. Portfolios returns are either equally-weighted (Columns 1 to 6) or value-weighted (Columns 7 to 12). Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Columns 1 to 6, and 1990-2015 in Columns 7 to 12.

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Low σ industries	3.695	5.583	6.209**	-1.296	-3.502**	-7.197*	-2.204	1.669	-0.002	0.606	-3.244	-1.040
	(4.034)	(4.404)	(2.828)	(2.926)	(1.488)	(4.181)	(2.843)	(3.690)	(3.016)	(2.307)	(1.996)	(3.106)
High σ industries	16.257***	4.021	5.624	0.466	-1.801	-18.058**	12.903***	0.775	3.532	-4.513	3.472	-9.431**
	(6.054)	(2.860)	(3.483)	(2.948)	(3.409)	(7.199)	(3.320)	(2.832)	(3.604)	(3.138)	(2.719)	(3.921)
High σ - Low σ						-10.861*						-8.391*
						(6.422)						(4.574)

	Equally weighted						Value weighted					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
Low γ industries	11.947***	1.538	5.363	-0.909	-0.366	-12.313**	4.925**	-1.487	-0.034	-3.452	2.527	-2.399
	(4.284)	(3.109)	(3.653)	(2.800)	(2.014)	(4.918)	(2.305)	(3.299)	(3.801)	(2.595)	(2.050)	(3.529)
High γ industries	18.137***	7.177*	5.467*	-2.212	-5.979***	-24.116***	19.463***	2.742	-0.805	-2.715	-6.204**	-25.667***
	(6.577)	(3.803)	(3.241)	(2.570)	(2.123)	(7.287)	(4.881)	(3.098)	(2.548)	(2.542)	(2.725)	(6.510)

Table B.19
Chinese Import Growth Betas - Controlling for US market returns

This table presents Chinese import growth betas of each shipping costs portfolios (Columns 1 to 6) and weight-to-value portfolios (Columns 7 to 12). Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. In any given month, stocks are independently sorted into five portfolios based on either their industry shipping costs or weight-to-value ratio in the previous year, and into three portfolios based on either their market capitalization (Size) in the previous month or based on their return on assets (ROA) in year t-2. Stocks at the intersection of the two sorts are grouped together to form portfolios based on shipping costs and either Size or ROA (Columns 1 to 6), and based on weight-to-value and either Size or ROA (Columns 7 to 12). We then compute Chinese import growth betas separately for each (double-sorted) portfolio as the coefficient β of the following OLS regression estimated at the monthly frequency over the sample period: $R_t^{EW} = \beta ChImpGr_t + \gamma MKTRF_t + \alpha + u_t$, where R_t^{EW} is the equally-weighted portfolio excess return in month t, ChImpGr_t is the growth rate of Chinese imports to the U.S. between month t and the same month in the previous year and MKTRF is the market portfolio minus the risk-free rate from Kenneth French's website. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1985-2015 in Columns 1 to 6, and 1990-2015 in Columns 7 to 12.

Chinese Import Growth Betas (controlling for US market returns)

	Shipping cost portfolios						Weight-to-value portfolios					
	Low	2	3	4	High	Hi-Lo	Low	2	3	4	High	Hi-Lo
	-0.490**	-0.275	-0.206	-0.142	-0.063	0.371*	-0.517*	-0.115	-0.229	-0.068	-0.038	0.429
	(0.218)	(0.184)	(0.165)	(0.128)	(0.113)	(0.222)	(0.287)	(0.251)	(0.221)	(0.155)	(0.146)	(0.308)
	Size terciles						Size terciles					
T1	-0.603**	-0.515**	-0.385*	-0.239	-0.156	0.370	-0.735*	-0.374	-0.355	-0.152	-0.128	0.528
	(0.300)	(0.238)	(0.211)	(0.181)	(0.172)	(0.264)	(0.403)	(0.311)	(0.290)	(0.228)	(0.216)	(0.383)
T2	-0.465*	-0.236	-0.140	-0.111	-0.240	0.221	-0.474	-0.008	-0.292	-0.047	-0.099	0.346
	(0.253)	(0.210)	(0.185)	(0.148)	(0.147)	(0.253)	(0.323)	(0.291)	(0.238)	(0.182)	(0.188)	(0.345)
T3	-0.300*	-0.054	-0.077	-0.087	0.041	0.333	-0.190	0.042	-0.027	-0.013	0.051	0.208
	(0.176)	(0.153)	(0.132)	(0.111)	(0.102)	(0.215)	(0.233)	(0.203)	(0.189)	(0.130)	(0.128)	(0.285)
	ROA terciles						ROA terciles					
T1	-0.568**	-0.427*	-0.370	-0.049	-0.025	0.514*	-0.662*	-0.252	-0.461	0.018	0.166	0.743**
	(0.281)	(0.243)	(0.230)	(0.215)	(0.184)	(0.279)	(0.365)	(0.340)	(0.303)	(0.271)	(0.224)	(0.377)
T2	-0.367**	-0.107	-0.091	-0.136	-0.094	0.259	-0.260	0.161	-0.116	-0.080	-0.035	0.105
	(0.186)	(0.162)	(0.143)	(0.129)	(0.122)	(0.216)	(0.243)	(0.210)	(0.205)	(0.168)	(0.159)	(0.307)
T3	-0.372**	-0.227	-0.267**	-0.186	-0.059	0.338*	-0.379*	-0.106	-0.224	-0.098	-0.053	0.314
	(0.152)	(0.147)	(0.133)	(0.113)	(0.104)	(0.179)	(0.201)	(0.192)	(0.188)	(0.133)	(0.127)	(0.225)

Table B.20
Returns - Fama Mac-Beth Regressions - Controlling for intra-industry input linkages

This table reports variants of the Fama Mac-Beth regressions in Table B.14 for different subsamples. In Columns [1] and [2] (respectively Columns [3] and [4]), we run the regressions only in industries for which the share of inputs sourced from the same (SIC4) industry is below (respectively above) five percent. The share of inputs sourced from the same (SIC4) industry is computed from the BEA 2007 input-output matrix. Shipping costs are measured at the industry-year level as the % difference of the Cost-Insurance-Freight value with the Free-on-Board value of imports. Weight-to-value is measured at the industry-year level as the ratio of the weight in kilograms over the Free-On-Board value of imports. $BETA_{USStockMarket}$ for a stock in a given month is the beta of the stock monthly returns with the US stock market return estimated using monthly data over the past 60 months. LN(ME) is the logarithm of firm market capitalization in the previous month. BE/ME is book-to-market equity defined as book value of equity (item CEQ) divided by market value of equity (item CSHO×item PRCC_F) at the end of fiscal year t-2. Return on assets (ROA) is defined as operating income after depreciation and amortization (item OIBDP-item DP) divided by total assets at the end of fiscal year t-2. I/K is capital expenditure (item CAPX) divided by property, plant and equity (item PPENT) at the end of fiscal year t-2. MARKET LEV is total debt (item DLC+item DLTT) divided by the sum of total debt and market value of equity at the end of fiscal year t-2. All independent variables are windsorized at the 99th percentile of their empirical distribution. Standard errors are estimated using Newey-West with 12 lags. ***, **, and * indicate significance at the 1, 5, and 10% level, respectively. The sample period is 1975-2015 in Columns 1 and 2, and 1990-2015 in Columns 3 and 4.

	RET Intra-industry input share			
	$\leq 5\%$	$> 5\%$	$\leq 5\%$	$> 5\%$
Shipping Costs	-0.524**	-1.051**		
	(0.203)	(0.432)		
Log Weight_to_value			-0.019***	-0.027***
			(0.006)	(0.009)
$BETA_{US.Stock.Market}$	-0.015	0.015	-0.014	0.010
	(0.015)	(0.017)	(0.021)	(0.022)
LN(ME)	-0.005	-0.014**	-0.001	-0.014
	(0.006)	(0.007)	(0.007)	(0.009)
BEME	0.039***	0.025	0.048***	0.019
	(0.012)	(0.021)	(0.017)	(0.030)
ROA	0.119**	0.090	0.081	0.106*
	(0.056)	(0.055)	(0.066)	(0.057)
I/K	-0.005	-0.067**	0.025	-0.079*
	(0.027)	(0.034)	(0.032)	(0.045)
MARKET LEV	-0.001	0.020	0.014	0.042
	(0.051)	(0.049)	(0.071)	(0.067)
Observations	245238	191172	168194	144547
R^2	0.057	0.065	0.060	0.064