Globalization, Inequality, and Political Lobbying: The Path to Fragmentation

Tomohide Mineyama
International Monetary Fund

Dongho Song*
Johns Hopkins University

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Abstract

We provide new insights into how fragmentation emerges endogenously from the uneven distribution of globalization's gains. We develop a Ricardian trade model featuring input-output linkages, dual-layer income heterogeneity—where households' income differs in labor and financial wealth across sectors and within households—and endogenous sectoral lobbying. Lobbying for protection by trade-affected sectors involves strategic complementarity, as higher production costs induced by one sector's protection propagate through input-output linkages, intensifying import competition in other sectors and fueling their lobbying efforts. This effect is further reinforced by dynamic complementarity between past and current trade restrictions, where prior restrictions lower the cost of obtaining additional protection. Quantitative simulations calibrated to U.S.-China sectoral productivity and tariff data capture the dynamic decline in support for globalization, which peaked in the early 2000s but fell sharply in the past decade due to shifting sectoral exposure and evolving trade policy. The model highlights how fragmentation, once set in motion, can escalate endogenously through lobbying dynamics, making globalization's reversal not just a policy choice but an outcome of economic and political forces.

JEL Classification: D57, D58, D63, D72, F1, F2, F4, F6

Keywords: Economic inequality, heterogeneous households, globalization, multi-sector, input-output network linkages, political lobbying, Ricardian trade, trade restrictions.

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E-mail: TMineyama@imf.org (Tomohide Mineyama), dongho.song@jhu.edu (Dongho Song)

1 Introduction

Global economic integration today faces growing challenges from rising protectionism and escalating geopolitical fragmentation, which are reshaping global trade patterns, see discussions in Aiyar et al. (2023b) and Gopinath et al. (2025). While the magnitude of trade gains remains debated, significant welfare losses from autarky suggest that fragmentation is not inevitable, e.g., Arkolakis et al. (2012), Adão et al. (2020), Arkolakis et al. (2019), Boehm et al. (2024), Costinot and Rodríguez-Clare (2014), Galle et al. (2022), Levchenko and Zhang (2014), Melitz and Redding (2015), Ossa (2015), Ramondo and Rodríguez-Clare (2013). However, a growing body of empirical research links the unequal distribution of globalization's benefits to rising support for protectionist policies as reviewed in Colantone et al. (2022) and Rodrik (2021).

Whether a reinforcing economic mechanism translates economic discontent into escalating trade restrictions remains an open question. Existing models lack a clear microfoundation for the forces driving this fragmentation, particularly in the United States. For instance, although globalization backlash is often associated with intensified import competition with foreign countries, tradable sectors comprised only 9% of total U.S. employment in 2023, suggesting a limited direct impact on the broader economy. Additionally, globalization has expanded financial flows, boosting U.S. investment income and reinforcing its status as a net beneficiary of global integration. These patterns suggest that a framework capable of reconciling globalization's positive aggregate effects with its uneven distribution is essential for explaining the political momentum behind fragmentation. Moreover, as globalization has proceeded over the past few decades, it is not obvious why concerns about geopolitical fragmentation are arising in the current conjuncture. Presumably, tracking the evolution of the number of winners and losers over time would be a key metric, and further, a framework explicitly modeling how this shift fuels support for protectionist policies is therefore necessary, even as overall welfare remains positive.

This paper makes two key contributions. First, we empirically establish a causal link from globalization to economic (dis)content and policy shifts, broadening the scope of globalization beyond trade to include financial factors. We link shocks induced by trade—specifically import penetration from China, while accounting for differences in wealth distribution—to attitudes toward globalization measured in surveys, extending the approach of Autor et al. (2013, 2020, 2021). We find that individuals residing in regions with higher import penetration are more likely to perceive foreign trade as a threat, whereas wealthier individuals tend

to view it as an opportunity. Using firm-level lobbying expenditure data from the Senate Office of Public Records (SOPR), we show that trade-affected firms lobby for protectionism. Lobbying spending is nearly ten times larger than campaign contributions made by firms. While the literature has occasionally examined campaign contributions—including Autor et al. (2020)—lobbying expenditures more directly reflect firms' efforts to influence trade policy, whereas campaign contributions may serve multiple purposes. This represents a novel contribution to the literature, as lobbying data are underexplored despite providing a more economically significant and conceptually clearer measure for addressing our research question. This empirical contribution lays the groundwork for our second, and most important, contribution.

Second, we develop a Ricardian model of a two-country (U.S. and China), multi-sector economy with tradable and nontradable goods and input-output linkages, drawing on Caliendo and Parro (2015), Levchenko (2016), Galle et al. (2022), and Baqaee and Farhi (2024). A key innovation is embedding sectoral lobbying within a general equilibrium framework, significantly extending Grossman and Helpman (1994), which operates in partial equilibrium. This framework contributes to the literature by demonstrating how globalization's uneven distribution fuels the political momentum behind fragmentation.

We outline important model features to facilitate understanding. On the production side, the model extends Eaton and Kortum (2002) by introducing sector-specific labor endowments, where workers have sector-specific, non-transferable skills, as in Jones (1971) and Mussa (1974), and incorporating intermediate goods into the production function alongside labor. These linkages generate cross-sectoral effects of globalization, where the impact on one sector propagates to others through input-output relationships.

On the household side, we introduce heterogeneity in income sources—labor and financial wealth. Labor income is determined by sectoral employment, with workers in exposed tradable sectors experiencing wage pressures due to trade globalization (Stolper and Samuelson, 1941), while input-output linkages create spillovers into nontradable sectors. In addition, globalization increases the rate of return on financial assets underpinned by high foreign growth, benefiting wealthier individuals while exacerbating within-sector inequality. This dual-layered heterogeneity—across sectors and within households—creates distinct winners and losers from globalization, shaping their incentives to support or oppose trade policies.

Lobbying decisions are embedded within a general equilibrium framework, where trade-affected sectors strategically seek protection. The model introduces strategic complementar-

ities in lobbying, as lobbying decisions in one sector influence payoffs in others, reinforcing protectionist pressures. The government determines trade policy by maximizing a weighted objective function balancing social welfare and lobbying contributions. A sector obtains protection if its benefits exceed the spillover costs imposed on other sectors. Importantly, this decision crucially depends on the existing level of trade restrictions, introducing a dynamic complementarity between past trade restrictions and current policy decisions.

To evaluate the model quantitatively, we construct a sectoral dataset for the U.S. and China (1988-2023) using data from the KLEMS project, the China Industrial Productivity (CIP) Database, and the U.S. Bureau of Economic Analysis (BEA). We harmonize sectoral classifications into 32 sectors (19 tradable, 13 nontradable), derive input-output matrices (U.S. 1997, China 1993), and calibrate key model parameters. These include sectoral trade elasticities (Caliendo and Parro, 2015 and Baqaee and Farhi, 2024), household wealth shares (Survey of Consumer Finance), labor income, employment shares, risk aversion, and tariff rates sourced from WITS and Fajgelbaum et al. (2019). The calibrated model, incorporating sectoral data, factor inputs, TFP, and tariff rates among others, allows us to simulate key macroeconomic and distributional outcomes under globalization and the effects of lobbying-induced trade restrictions.

The model replicates key empirical patterns, predicting rising aggregate consumption—our welfare measure—alongside shifts in trade patterns, with declining net exports as a share of GDP, consistent with observed trends. At the same time, we observe a significant decline in the share of households benefiting from globalization, which fell from a peak in the early 2000s to substantially lower levels over the past decade, consistent with the narrative provided by Colantone et al. (2022) and Rodrik (2021). This time-varying support, a novel feature of our model, is shaped by (i) heterogeneous Chinese sectoral growth, (ii) input-output linkages, and (iii) shifting tariff levels. Without (i), the distribution of winners and losers remains static, holding (iii) fixed; without (ii), globalization's effects do not propagate to nontradable sectors, which host a vast majority of workers; and (iii) tariff changes amplify shifts in globalization support. Despite increasing overall welfare, globalization's benefits become more concentrated, fueling greater opposition. Sectoral heterogeneity explains this phenomenon—tradable sectors like apparel decline under foreign competition, while the transportation equipment sector benefits from cheaper inputs, as well as the relatively limited impact of foreign sectoral growth due to its low trade elasticity. Wealth heterogeneity further reinforces these disparities, as financial assets cushion some households from negative shocks,

while others within the same sector experience declining labor incomes.

Despite increasing overall welfare, globalization's benefits become more concentrated, fueling greater opposition. The model finds that, from 1988 to 2023, about half of tradable sectors do not support trade restrictions as they benefit from globalization, while the remaining half actively lobby for restrictions. This divergence within tradable sectors underscores globalization's uneven gains and emphasizes the role lobbying efforts play in shaping government responses, which also factor in social welfare. There are two types of complementarities driving protectionism. First, strategic complementarities exist because one sector's payoff from lobbying is influenced by the lobbying efforts of other sectors. Specifically, higher production costs induced by one sector's protection propagate through input-output linkages, making the import competition in other sectors more severe and thereby fueling lobby activities by these sectors. Second, there is a dynamic complementarity between existing tariffs and sectoral payoffs, as higher existing trade restrictions reduce the incremental cost of further insulation, strengthening incentives to impose new restrictions. Together, these complementarities generate a self-reinforcing cycle, ultimately leading, as predicted by our model, to all lobbying efforts from tradable sectors being accepted by 2023. To assess welfare implications, we consider a counterfactual scenario with a uniform tariff policy, which illustrates the limiting case of this process: if all sectors successfully lobby for protection, sectoral inequality declines, but at the expense of a substantial reduction in overall welfare.

Broadly speaking, our paper is related to the expanding literature on geopolitical fragmentation (e.g., Aiyar et al., 2023a, Ambrosino et al., 2024, Antràs, 2020, Attinasi et al., 2023, Blanga-Gubbay and Rubinova, 2023, Bloom et al., 2019, Bolhuis et al., 2023, Bonadio et al., 2024, Campos et al., 2023, Cerdeiro et al., 2021, Fajgelbaum and Khandelwal, 2022, Fajgelbaum et al., 2019, Flaaen and Pierce, 2019, Fernández-Villaverde et al., 2024, Góes and Bekkers, 2022, Goldberg and Reed, 2023, Gopinath et al., 2025, Hakobyan et al., 2023, Javorcik et al., 2024, Mohr and Trebesch, 2024, Sampson, 2017, Utar et al., 2023).

We contribute to the literature studying the backlash against globalization, including Autor et al. (2013, 2020, 2021), Che et al. (2022), Choi et al. (2024), Colantone et al. (2022) (review), Di Tella and Rodrik (2020), Dippel et al. (2022), Galle et al. (2022), Jensen et al. (2017), Leamer (1996), Margalit (2011), and Rodrik (2021).

In the modeling context, we build on the international trade literature, e.g., Adão et al. (2020), Arkolakis et al. (2012), Arkolakis et al. (2019), Baqaee and Farhi (2024), Boehm et al. (2024), Caliendo and Parro (2015), Costinot and Rodríguez-Clare (2014), Eaton and

Kortum (2002), Galle et al. (2022), Levchenko and Zhang (2014), Levchenko (2016), Melitz and Redding (2015), Ossa (2015), and Ramondo and Rodríguez-Clare (2013).

We are related to the growing literature on geoeconomics and economic coercion, recent papers including Becko and O'Connor (2024), Broner et al. (2024), Clayton et al. (2024), Kleinman et al. (2024), Liu and Yang (2024), and Pflueger and Yared (2024), and going back to Hirschman (1945), Keohane and Nye (1973), and Keohane (1984). Among them, our paper complements studies highlighting the self-reinforcing dynamics of fragmentation: Clayton et al. (2024) show that independent pursuit of economic security triggers a "fragmentation doom loop," where each country's withdrawal diminishes global integration, prompting further fragmentation; and Liu and Yang (2024) demonstrate that shifts in international power driven by asymmetric trade dependence reshape geopolitical alignments, which in turn influence trade relationships and can reinforce fragmentation dynamics.

The paper is structured as follows. Section 1 introduces the study. Section 2 empirically establishes a causal link between economic discontent and policy shifts. Section 3 presents a Ricardian model of a two-country, multi-sector economy with tradable and nontradable goods and input-output linkages, and sectoral lobbying dynamics. Section 4 examines key implications from model simulations. Section 5 concludes. The Appendix provides additional details and the model solution.

2 Empirical Evidence

2.1 Globalization and shifting public attitudes

In this section, we present empirical evidence on the effects of globalization—specifically, China's economic expansion and rising imports—on the U.S. economy and public attitudes toward globalization.

Sectoral impact of Chinese growth

First, we examine the impact of Chinese economic growth on U.S. domestic industries using sectoral data compiled from the KLEMS project. To measure exogenous Chinese sectoral growth, we employ two approaches: (i) a productivity shock identified through the long-run restriction of Galí (1999), and (ii) the sectoral TFP growth estimated in the KLEMS database. Following Acemoglu et al. (2015), we account for both direct effects of sectoral

productivity growth and propagation through production networks. Specifically, we construct "downstream" and "upstream" shocks by using the Leontief inverse derived from input-output tables.

Table 1 presents the results. It indicates that Chinese sectoral productivity growth significantly lowers U.S. sectoral output in directly affected industries (e.g., $OwnProdShock_{it}^{CHN}$ in column (1)), consistent with the view that increased competition with China under globalization damaged U.S. domestic industries. Note that, as the regression includes a time fixed effect, the coefficient elicits the impact on a sector relative to the average aggregate effect. The effects also propagate upstream via input demand, while downstream sectors benefit from lower input prices due to productivity growth. The upstream result is in contrast to Acemoglu et al. (2015), who find that a supply shock propagates only downstream under perfect competition. Interestingly, non-tradable sectors also exhibit some effects, though their magnitude and statistical significance are lower than those observed in tradable sectors. We revisit these points in the context of our model.

Individuals' attitude toward globalization

Next, we assess how rising Chinese imports influenced individuals' attitudes toward globalization. Autor et al. (2020) provide an important contribution by leveraging the "China shock" of Autor et al. (2013), which measures regional import penetration of Chinese products instrumented by Chinese supply factors. Their findings indicate that regions more exposed to Chinese imports increased support for Republican candidates in the 2008 and 2016 U.S. Presidential elections. We expand the analysis by examining the effect of wealth holdings, as financial income may mitigate the adverse effects of trade-induced labor income losses. To do so, we combine regional wealth estimates from Suss et al. (2024), derived from the Survey of Consumer Finances (SCF), with regional import penetration and voting data from Autor et al. (2020). To the best of our knowledge, this is the first paper that integrate the trade-induced globalization shock with financial data to examine heterogeneous impacts across wealth positions.

Table 2 presents the results. Columns (1)–(2) confirm that Chinese import penetration is associated with increased support for Republican candidate (Trump) in the 2016 election. Additionally, median household wealth level in 2000 (ln(Wealth)) is negatively associated with Republican vote share, consistent with our hypothesis that wealthier households are more likely to benefit from globalization. The result suggests that opposition to globalization—

Table 1: Impact of Chinese productivity on U.S. sectoral output

	Depenent var: US sectoral output					
	All	Tradable	Non-tradable	All	Tradable	Non-tradable
	(1)	(2)	(3)	(4)	(5)	(6)
$OwnProdShock_{it}^{CHN}$	-0.840***	-1.449*	-0.349*			
	(0.255)	(0.797)	(0.207)			
$DownstreamProdShock_{it}^{CHN}$	5.851***	8.556**	2.588**			
	(1.844)	(3.095)	(1.233)			
$UpstreamProdShock_{it}^{CHN}$	-4.320***	-7.277**	-1.856*			
	(1.498)	(3.107)	(0.996)			
$Own\Delta TFP_{it}^{CHN}$				-0.890**	-3.485**	-0.281*
				(0.415)	(1.617)	(0.153)
$Downstream\Delta TFP_{it}^{CHN}$				3.705**	11.626***	0.480
				(1.848)	(3.571)	(0.652)
$Upstream\Delta TFP_{it}^{CHN}$				-2.866*	-9.114*	-0.384
				(1.551)	(5.149)	(0.536)
N of obs.	1,638	598	1,040	1,764	644	1,120
N of sectors	63	23	40	63	23	40
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Observations are annual. Dependent variable is the logarithm of U.S. sectoral output. The data is obtained from the Integrated Industry-Level Production Account (KLEMS) compiled by the U.S. Bureau of Economic Analysis (BEA). Main independent variable is the Chinese sectoral productivity shock identified by the long-run restriction of Galí (1999) in a univariate VAR of the growth rate of labor productivity and hours worked with 2-period lags, or the growth rate of sectoral TFP. Own, downstream, and upstream shocks are defined following Acemoglu et al. (2015) and calculrated using the US input-output matrix of 1997, which is the earliest available year. The independent variable is normalized so that the estimated coefficients represent percent changes in U.S. sectoral output responding to a 1 standard deviation chnage in Chinese sectoral productivity. Chinese sectoral data are obtained from the China Industrial Productivity (CIP) 4.0 Database, whose sample spans annually from 1988 through 2017. All regressions include the first and second lags of the dependent and main independent variables, as well as the first and second lagged U.S. sectoral labor productivity, hours worked, and labor input.

proxied by a vote for Trump—decreases with wealth. Columns (3)–(6) further explore the differential impacts of import penetration across wealth levels. Consistent with the hypothesis above, the result indicates that trade-related economic disruptions are more severe in lower-wealth regions. These findings remain robust to the inclusion of control variables.

To further investigate attitudes toward globalization, we use the Gallup Poll Social Series, which includes survey responses on perceptions of foreign trade.[1] We merge these survey responses with regional import penetration and wealth using survey respondents' zip codes. A

[1]Specifically, we use the question "What do you think foreign trade means for America? Do you see foreign trade more as – an opportunity for economic growth through increased U.S. exports or a threat to the economy from foreign imports?" Respondents select either "opportunity for economic growth" or "threat to economy from foreign imports".

Table 2: 2016 Presidential election Republican vote share

	(1)	(2)	(3)	(4)	(5)	(6)
Import penetration	2.604***	1.834***				
	(0.843)	(0.614)				
ln(Wealth)	-6.706***	-15.945***				
	(1.794)	(3.051)				
Import penetration						
× 1(Wealth 1st quantile)			4.626***	2.557***	3.293***	1.710*
			(0.898)	(0.768)	(1.139)	(0.875)
× 1(Wealth 2nd quantile)			3.935***	2.654***	3.855***	1.503*
			(1.159)	(0.737)	(1.291)	(0.789)
× 1(Wealth 3rd quantile)			1.008	1.219**	0.881	1.523***
			(1.272)	(0.554)	(1.141)	(0.586)
× 1(Wealth 4th quantile)			0.664	-0.280	1.885	0.954
			(1.186)	(0.828)	(2.707)	(1.094)
N of obs.	3,077	3,077	3,077	3,077	3,077	3,077
Wealth quantile controls	—	—	No	No	Yes	Yes
Full controls	No	Yes	No	Yes	No	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable is the change in percentage of two-party vote obtained by Republican candidate, 2016 (Trump) versus 2000 (Bush). Observations are counties, excluding Alaska and Hawaii. Main independent variables are the change in the import penetration of Chinese products from 2000 to 2014 and the median net wealth as of 2000 for each commuting zone (CZ). The import penetration used by Autor et al. (2020) was up to 2008, we use the updated estimates to 2014 by Autor et al. (2021). The net wealth is obtained from the Geofraphic Wealth Inequality Database provided by Suss et al. (2024). All regressions are estimated by 2SLS, using the supply-driven components of the import penetration (and their interactions with wealth quantiles) as exogenous instruments. Observations are weighted by counties' total votes in the 2000 presidential election, and standard errors are clustered by CZ. The top and bottom 0.5 percentiles of the dependent variable are excluded as outliers. In columns (5) and (6), controls include wealth quantile dummies. In columns (2), (4), and (6), full control variables are those used by Autor et al. (2020): industry and occupation controls (the CZ-level manufacturing employment share, the Autor and Dorn (2013) routine share, and offshorability index of a CZ's occupaitons); census division dummies; demographic controls (the percentage of a county's population in nine age, as well as the population shares that are female, college-educated, foreign-born, white, hispanic, and black); and the Republican two-party vote share in the presidential elections of 1992 and 1996. In addition, the full controls include the logarithm of the average income, average age, average age squared, the gini coefficient of wealth, and average household size at the CZ level, compiled in the Geofraphic Wealth Inequality Database.

key advantage of the Gallup survey is that it provides a direct measure of individual attitudes toward globalization, whereas presidential voting behavior may reflect broader political factors. Additionally, the panel structure of the survey allows us to control for individual and year fixed effects, unlike the cross-sectional nature of the presidential election analysis. We

Table 3: Individuals' attitude toward foreign trade in the Gallup Poll Social Series

	(1)	(2)	(3)	(4)	(5)	(6)
Import penetration	-0.028***	-0.028***				
	(0.008)	(0.008)				
ln(Wealth)	0.106***	0.108***				
	(0.015)	(0.014)				
Import penetration						
× 1(Wealth 1st quantile)			-0.047***	-0.047***	-0.029**	-0.028**
			(0.009)	(0.009)	(0.014)	(0.014)
× 1(Wealth 2nd quantile)			-0.033***	-0.033***	-0.031**	-0.031**
			(0.011)	(0.011)	(0.013)	(0.012)
× 1(Wealth 3rd quantile)			-0.017	-0.017	-0.019	-0.018
			(0.019)	(0.018)	(0.024)	(0.024)
× 1(Wealth 4th quantile)			0.028**	0.028**	-0.014	-0.015
			(0.012)	(0.012)	(0.024)	(0.024)
N of obs.	17,716	17,679	17,716	17,679	17,716	17,679
Wealth quantile controls	—	—	No	No	Yes	Yes
Full controls	No	Yes	No	Yes	No	Yes
ID FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable takes one if the answer to the question "What do you think foreign trade means for America? Do you see foreign trade more as – an opportunity for economic growth through increased U.S. exports or a threat to the economy from foreign imports?" is "opportunity for economic growth" whereas it is zero for "threat to economy from foreign imports". Observations are individuals. The survey spans 2000 to 2020. Main independent variables are the change in the import penetration of Chinese products from 2000 to 2014 and the median net wealth as of 2000 for each commuting zone (CZ) obtained from the Geofraphic Wealth Inequality Database provided by Suss et al. (2024). These are linked to individuals' survey responses using the zip code information. All regressions are estimated by 2SLS, using the supply-driven components of the import penetration (and their interactions with wealth quantiles) as exogenous instruments. In columns (5) and (6), controls include wealth quantile dummies. In columns (2), (4), and (6), full control variables include age and age squared. Time and individual fixed effects are included in all regressions.

differ from the empirical literature that investigates the relation between globalization-related attitudinal variables and voting behavior (see Rodrik (2021) for a review) in that we examine the causal link from globalization-induced economic shocks, measured by the import penetration from China, to the attitude toward globalization and how the impact differs across wealth distribution.

Table 3 confirms that individuals residing in regions with higher import penetration are more likely to perceive foreign trade as a threat, whereas wealthier individuals are more likely

to view it as an opportunity. These are aligned with the findings in Table 2.

2.2 Globalization's impact on politics and lobbying

Similar to voting behavior, one can expect that campaign contributions are influenced by globalization. We provide a theoretical justification for this relationship in Appendix B.2 (see (A-63)). To empirically assess this link, we conduct an analysis analogous to the previous subsection, using campaign contribution data from the Database on Ideology, Money in Politics, and Elections (DIME), compiled by Bonica (2015). This dataset, which links campaign contributions to contributors' ideological leanings, was also utilized by Autor et al. (2020).

Table 4 presents the results. Column (1) shows that regions with lower wealth exhibit higher elasticities with respect to Chinese import penetration. Since these regions experience larger economic losses from imports while benefiting less from globalization-induced asset returns, they contribute more financially to political campaigns aimed at reversing globalization trends. This finding remains robust across various specifications, as shown in columns (2)–(4). Notably, regions in the highest wealth quantile display the smallest coefficients, which are consistently insignificant at the 10 percent level.

We further examine political lobbying in response to globalization. Under the Lobbying Disclosure Act of 1995, amended by the Honest Leadership and Open Government Act of 2007, lobbying activities—including expenditures and associated policy issues—must be publicly disclosed. Total lobbying spending hovered around 3 to 3.5 billion dollars per year in the 2010s, nearly doubling compared to the level in 1998, the earliest year for which data is available. The scale is far larger than campaign contributions by Political Action Committees (PAC)—most of which represent business, labor or ideological interests—which were around 200 to 250 million dollars per year during the same period (Bombardini and Trebbi, 2020). Further, the disclosure requires to identify policy issues involving lobbying activities, such as trade, tax, and labor issues, which enables us to specify the spending of our interest. We compile firm-level lobbying expenditures from filings submitted to the Senate Office of Public Records (SOPR). While these data have been utilized in political economy (e.g., Kang, 2015) and corporate finance research (e.g., Bertrand et al., 2014; Borisov et al., 2015), they remain largely unexplored in the macroeconomic literature. Since lobbying filings are reported at the level of individual legal entities, we consolidate them at the parent company

Table 4: Campaign contributions to Republican relative to Democrat

	(1)	(2)	(3)	(4)
Import penetration				
× 1(Wealth 1st quantile)	0.612***	0.562***	0.325*	0.528***
	(0.157)	(0.174)	(0.186)	(0.186)
× 1(Wealth 2nd quantile)	0.443***	0.480***	0.504***	0.447***
	(0.120)	(0.155)	(0.136)	(0.167)
× 1(Wealth 3rd quantile)	0.265*	0.373**	0.382**	0.479**
	(0.139)	(0.152)	(0.172)	(0.202)
× 1(Wealth 4th quantile)	0.037	0.258	0.011	0.183
	(0.164)	(0.183)	(0.255)	(0.225)
N of obs.	2,319	2,315	2,319	2,315
Wealth quantile controls	No	No	Yes	Yes
Full controls	No	Yes	No	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable is the differential between Republican and Democrat candidates in terms of the campaign contribution growth from the 2002 to 2016 elections cycles. Observations are country-congressional district pairs, excluding Alaska and Hawaii. Main independent variables are the change in the import penetration of Chinese products from 2000 to 2014 and the median net wealth as of 2000 for each commuting zone (CZ), as in Table 2. Control variables include those in Table 2, as well as the share of campaign contributions received by Republican candidates and the CF scores of each of Republican and Democrat candidates in the 2002 election cycle at the congressional district-level compiled by the DIME dataset. Observations are weighted by a county-district cell's share in the total year-2002 voting age population of a district, and standard errors are twoway clustered by CZ and congressional districts.

level to construct a firm-by-year dataset.[2] Figure 1 illustrates the rising share of lobbying expenditures allocated to trade-related issues (e.g., trade and tariffs), peaking in 2018-2019. Although this trend has moderated in recent years, lobbying expenditures on trade remain significantly higher than a decade ago.

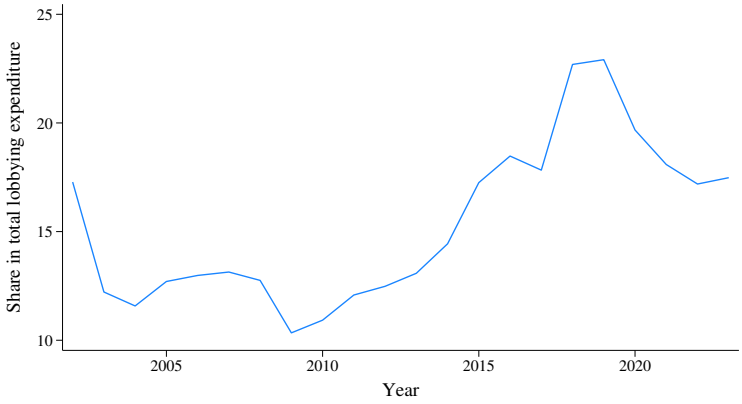
Table 5 analyzes the impact of Chinese import exposure on firms' lobbying activities. Consistent with earlier findings, greater exposure to Chinese imports—measured at the SIC 4-digit industry level—is associated with increased lobbying expenditures on trade issues.

2.3 Discussion

The empirical evidence presented in this section highlights the substantial effects of Chinese economic growth on the U.S. economy. Overall, the findings support the hypothesis that

[2]For example, entities such as "Amazon Corporate," "Amazon.com Services," and "Amazon Web Services" are separately registered in the data. We aggregate these under "Amazon.com, Inc."

Figure 1: Lobbying expenditure on trade issues



Notes: Lobbying expenditure on trade and tariff as a share of total lobbying expenditure. Company fixed effects are removed. Lobbying expenditure data are collected from the Senate Office of Public Records (SOPR), which are linked to listed companies' names using the S&P Capital IQ data.

Table 5: Lobbying expenditure

	(1)	(2)
Import penetration	0.230**	0.317**
	(0.109)	(0.132)
N of obs.	4,457	4,457
ID FE	No	No
Year FE	Yes	Yes

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: Dependent variable is the lobbying expenditure on trade issues as a share of total lobbying expenditure. Observations are firms by year. The independent variable is the change in the import penetration of Chinese products from 1999 to 2011 at SIC 4-digit level, provided by Acemoglu et al. (2016). Column (2) is estimated by 2SLS, using the supply-driven components of the import penetration as exogenous instruments. Time fixed effects are included in all regressions. SEs are clustered by firm.

increased competition from globalization has adversely affected U.S. domestic industries and contributed to shifting public sentiment away from globalization. However, the impact is multifaceted. Sectoral propagation through production networks simultaneously creates both beneficiaries and adversely affected industries (e.g., upstream and downstream effects in Table 1). Moreover, wealth holdings play a crucial role in shaping the effects of globalization, as its consequences extend beyond labor income to financial outcomes. Political responses are also complex, influenced not only by economic disruptions but also by the role of powerful lobbying entities, such as large firms actively shaping trade policy.

As such, a comprehensive assessment of the macroeconomic implications of Chinese growth requires a framework that integrates these various dimensions. In the next section, we develop

a model that accounts for these factors.

3 Model

3.1 Setting

Consumption basket. Consider n types of goods. There is a continuum of households h on an interval $[0, h_j]$ for each good producing sector $j = 1, 2, ..., n$, with $\sum_{j=1}^{n} h_j = 1$. The consumption basket is given by a Cobb-Douglas aggregator:

$$C_t^{jh} = \prod_{i=1}^{n} \left(C_{it}^{jh} \right)^{v_i}, \tag{1}$$

where C_{it}^{jh} denotes consumption of good i at time t by household h working in sector j. $v_i > 0$ with $\sum_{i=1}^{n} v_i = 1$ represents consumers' preference over individual goods, which is assumed identical across households. C_{it}^{jh} is a CES aggregator of home- and foreign-produced goods:

$$C_{it}^{jh} = \left(\xi_i (C_{it}^{Hjh})^{\frac{\theta_i - 1}{\theta_i}} + (1 - \xi_i)(C_{it}^{Fjh})^{\frac{\theta_i - 1}{\theta_i}} \right)^{\frac{\theta_i}{\theta_i - 1}}, \tag{2}$$

where H and F denote home- and foreign-produced goods, and θ_j is the elasticity of substitution. ξ_i governs the steady-state import share, which reflects non-price competitiveness or barriers for trade. The corresponding price is given by

$$\lambda_{it} = \left(\xi_i^{\theta_i} (P_{it}^H)^{1-\theta_i} + (1 - \xi_i)^{\theta_i} (\tau_{it} P_{it}^F)^{1-\theta_i} \right)^{\frac{1}{1-\theta_i}}, \tag{3}$$

where τ_{it} is a tariff imposed on imported goods.

Households. Households in a home country (U.S.) maximizes their utility:

$$U_t^{jh} = \mathbb{E}_t \left[\sum_{s=0}^{\infty} \beta^{t+s} \frac{(C_{t+s}^{jh})^{1-\gamma} - 1}{1 - \gamma} \right], \tag{4}$$

$$\text{s.t.} \quad P_t C_t^{jh} + W_{t+1}^{jh} = R_t W_t^{jh} + \frac{1}{h_j} E_{jt} X_{jt}. \tag{5}$$

W_t^{jh} is the net wealth at the beginning of the period. Households in each sector are equally endowed with a fixed amount of sector-specific factor input X_{jt}/h_j, provide it for production inelastically, and receive earnings E_{jt}. Factor input X_{jt} can be sector-specific skills or capital,

which we assume non-transferable across sectors. $P_t = \prod_{i=1}^{n} \lambda_{it}^{v_i}$ is the domestic price index. R_t represents the gross nominal rate of return on wealth.

Tradable and non-tradable goods. Goods $i \in T = 1, 2, ..., n_T$ are tradable and the rest $i \in N$ is non-tradable. That is, $\xi_i = 1$ for $i \in N$.

Production. Consider a constant-return-to-scale Cobb-Douglas production function with intermediate inputs. Gross output Y_{it} is given by

$$Y_{it} = A_{it} X_{it}^{\alpha_i} \prod_{j=1}^{n} Y_{ijt}^{(1-\alpha_i)w_{ij}}, \tag{6}$$

where Y_{ijt} is intermediate good produced by sector j and used in sector i. A_{it} is productivity and X_{it} is factor input, which follow random-walk processes:

$$\begin{aligned} \ln A_{it} &= \ln A_{it-1} + \varepsilon_{it}^{A}, \\ \ln X_{it} &= \ln X_{it-1} + \varepsilon_{it}^{X}, \end{aligned} \tag{7}$$

where ε_{it}^{A} and ε_{it}^{X} are unexpected disturbances. $(1-\alpha_i) \in [0, 1]$ is the intermediate input share and $\sum_{j=1}^{n} w_{ij} = 1$. Each intermediate is a CES aggregator of home- and foreign-produced goods:

$$Y_{ijt} = \left(\xi_j (Y_{ijt}^{H})^{\frac{\theta_j - 1}{\theta_j}} + (1 - \xi_j)(Y_{ijt}^{F})^{\frac{\theta_j - 1}{\theta_j}} \right)^{\frac{\theta_j}{\theta_j - 1}}. \tag{8}$$

Foreign economy. A foreign country (China) has a symmetric structure with a variable with a superscript f denoting the one for the foreign economy.

Market clearing. Market clearing condition is given by

$$\underbrace{\underbrace{\sum_{j=1}^{n} \int_{0}^{h_j} C_{it}^{Hjh} dh}_{\text{Final goods}} + \underbrace{\sum_{j=1}^{n} Y_{jit}^{H}}_{\text{Intermediate goods}}}_{\text{Home demand}} + \underbrace{\underbrace{\sum_{j=1}^{n} \int_{0}^{h_j^f} C_{it}^{fHjh} dh}_{\text{Final goods}} + \underbrace{\sum_{j=1}^{n} Y_{jit}^{fH}}_{\text{Intermediate goods}}}_{\text{Foregin demand (=exports)}} = \underbrace{Y_{it}}_{\text{Supply}}. \tag{9}$$

Equilibrium. The FOCs of households' and firms' optimization, market clearing conditions, and feasibility of production yield a competitive equilibrium, which composes of prices

$\{P_{it}, P_{it}^f, R_t\}$ and quantities $\{C_{it}^{jh}, C_{it}^{fjh}, Y_{it}, Y_{it}^f\}$ given $\{\varepsilon_{it}^A, \varepsilon_{it}^{Af}, \varepsilon_{it}^X, \varepsilon_{it}^{Xf}, \tau_{it}, \tau_{it}^f\}$. We treat home aggregate price index P_t as a numeraire. The equilibrium is computed as a solution to a system of linear equations. The detail is provided in Appendix A.

3.2 Impact of foreign economy

Sectoral output. Before deriving a model solution, it is instructive to see the impacts of foreign economy on the domestic one using a few equilibrium conditions. Our primary focus is on sectoral output $S_{it} = P_{it}Y_{it}$ as it is proportional to sectoral income $E_{it}X_{it}$ according to a firm's FOC with sector-specific input.

In the first-order approximation, the demand side of the economy is governed by the following equation by combining the FOCs and market clearing conditions:

$$\underbrace{d\boldsymbol{S}_t}_{\text{Sectoral output}} = \underbrace{\tilde{\boldsymbol{V}}'}_{\text{Network}} \Bigg\{ \underbrace{\tilde{\boldsymbol{v}} d(P_t C_t)}_{\text{Home aggregate demand}} \quad \underbrace{+\tilde{\boldsymbol{v}}^f d(P_t^f C_t^f)}_{\text{Foreign aggregate demand}} \quad \underbrace{-\tilde{\boldsymbol{\theta}}}_{\text{Elasticity}} \underbrace{(d\ln \boldsymbol{P}_t - d\ln \boldsymbol{P}_t^f)}_{\text{Relative price}} \quad \underbrace{+\boldsymbol{\eta} d\ln \boldsymbol{\tau}_t - \boldsymbol{\eta}^f d\ln \boldsymbol{\tau}_t^f}_{\text{Tariff}} \Bigg\}. \tag{10}$$

The derivation is provided in Appendix A. A variable with bold letters denotes a matrix or vector. $d\boldsymbol{S}_t$ is a n-by-1 vector that collects each sector's nominal output dS_{it} in the i-th element. $\tilde{\boldsymbol{V}}$ is the Leontief inverse adjusted with trade. $\tilde{\boldsymbol{v}}$ and $\tilde{\boldsymbol{v}}^f$ represent sectoral elasticity with respect to aggregate demand. $\tilde{\boldsymbol{\theta}}$ is a n-by-n diagonal matrix that collects demand elasticity $\tilde{\theta}_i$ in the (i,i) element. n-by-n matrices $\boldsymbol{\eta}$ and $\boldsymbol{\eta}^f$ govern the impact of tariffs.

(10) indicates that sectoral outputs are inversely related to the relative price between home and foreign goods while positively affected by home and foreign aggregate demand. In other words, foreign (China) economy's productivity and factor input growth affects domestic (U.S.) economy in both ways: a negative effect due to reduced price competitiveness as the foreign economy provides cheaper products; and a positive effect if foreign growth increases aggregate demand. These impacts are propagated through intermediate goods demand in production network, captured by $\tilde{\boldsymbol{V}}'$. Note that, without trade, (10) collapses to $d\boldsymbol{S}_t = \boldsymbol{V}'\boldsymbol{v}d(P_tC_t)$ where fluctuations in aggregate demand P_tC_t impact sectoral output through production network represented by the Leontief inverse $\boldsymbol{V}$. Tariffs $d\ln \boldsymbol{\tau}_t$ create a wedge between domestic and foreign prices and benefit or harm domestic sectors depending on the sign of corresponding elements in $\boldsymbol{\eta}$, conditional on aggregate demand.

Furthermore, using production function (supply side of the economy), we can show that sectoral output is related, to a first order, to exogenous productivity, factor inputs, and tariffs $(\boldsymbol{A}_t, \boldsymbol{A}_t^f, \boldsymbol{X}_t, \boldsymbol{X}_t^f, \boldsymbol{\eta}_t, \boldsymbol{\eta}_t^f)$, as well as aggregate consumption:

$$\underbrace{d\boldsymbol{S}_t}_{\text{Sectoral output}} = \underbrace{\check{\boldsymbol{V}}'}_{\text{Network}} \Bigg[\underbrace{\check{\boldsymbol{v}} d(P_t C_t)}_{\text{Home aggregate demand}} \underbrace{+\check{\boldsymbol{v}}^f d(P_t^f C_t^f)}_{\text{Foreign aggregate demand}} + \underbrace{\check{\boldsymbol{\theta}} \left\{ \boldsymbol{V}(d\ln \boldsymbol{A}_t + \boldsymbol{\alpha} d\ln \boldsymbol{X}_t) - \boldsymbol{V}^f (d\ln \boldsymbol{A}_t^f + \boldsymbol{\alpha}^f d\ln \boldsymbol{X}_t^f) \right\}}_{\text{Differential of home and foreign production}} \underbrace{+\boldsymbol{\eta} d\ln \boldsymbol{\tau}_t - \boldsymbol{\eta}^f d\ln \boldsymbol{\tau}_t^f}_{\text{Tariff}} \Bigg], \tag{11}$$

The derivation is provided in Appendix A. The third term in the square brackets represents the differential of home and foreign production, which affects the relative price between home and foreign goods, thereby sectoral outputs. Notice that the effect of production network appears twice: foreign economy's sectoral productivity and factor input growth first propagate downstream though supply chain represented by $\boldsymbol{V}^f$ in the third term; and then it spillovers upstream in the home country's sectors through $\check{\boldsymbol{V}}'$.

Aggregate consumption. Aggregate consumption can be derived using the market clearing conditions for non-tradable goods:

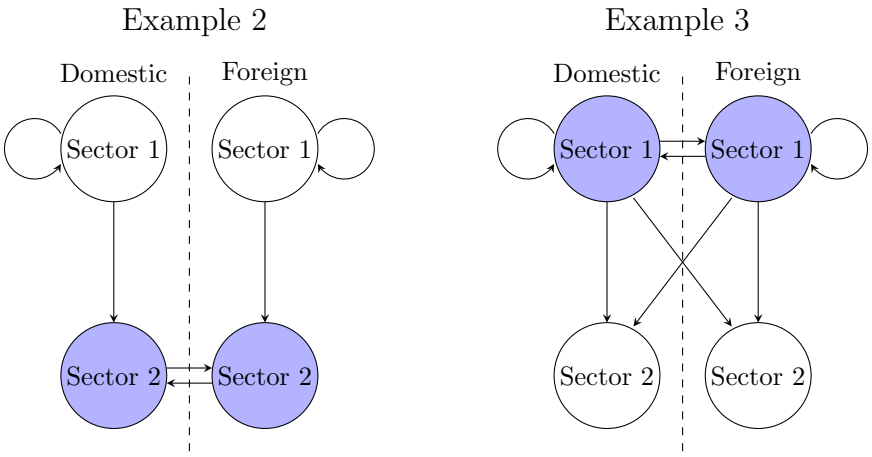
$$\underbrace{v_N}_{\text{Non-tradable share}} \underbrace{d(P_t C_t)}_{\text{Aggregate consumption}} = \underbrace{\left(\sum_{i \in N} (\boldsymbol{V}^{-1})_i \right)' d\boldsymbol{S}_t}_{\text{Final expenditure on non-tradable goods}}, \tag{12}$$

where $v_N = \sum_{i \in N} v_i$. $(\boldsymbol{V}^{-1})_i$ is the i-th column vector of $\boldsymbol{V}^{-1}$. The intuition is that, due to the Cobb-Douglas utility function, a constant share of total expenditure goes to individual goods, which enables us to back out the aggregate consumption from sectoral output.

Using the consumption Euler equation, the real rate of return is given by

$$d\ln \tilde{R}_{t+1} = \gamma \left(\mathbb{E}_t \left[d\ln C_{t+1} \right] - d\ln C_t \right), \tag{13}$$

Figure 2: Examples of production network



Notes: Blue circles are tradable goods sectors. Arrows indicate input usage.

3.3 Illustrative examples

We provide intuitions of the model using a few simple examples. For illustrative purposes, we set $d\ln \boldsymbol{A}_t = d\ln \boldsymbol{X}_t = d\ln \boldsymbol{X}_t^f = d\ln \boldsymbol{\eta}_t = d\ln \boldsymbol{\eta}_t^f = 0$ and focus on foreign productivity $d\ln \boldsymbol{A}_t^f$.

Example 1: No production network. As a starting point, suppose that there is no input-output linkage, i.e., $\boldsymbol{\alpha} = \boldsymbol{\alpha}^f = \boldsymbol{I}$. Then, (11) collapses to

$$dS_{it} = \tilde{\xi}_i v_i d(P_t C_t) + (1 - \tilde{\xi}_i^f) v_i^f d(P_t^f C_t^f) - \tilde{\theta}_i d\ln A_{it}^f. \tag{14}$$

Sectoral output is negatively affected, conditional on aggregate demand, by foreign productivity $d\ln A_{it}^f$ as it will decrease relative prices through the abundance of supply. Without input-output linkage, sectoral shocks do not spillover to other sectors conditional on aggregate consumption. If a good is non tradable, (14) is further reduced to

$$dS_{it} = v_i d(P_t C_t), \tag{15}$$

which indicates that non-tradable goods are not affected by the same sector in the foreign economy. If a foreign productivity shock has positive aggregate consumption effect, it is possible that non-tradable sectors benefit from it whereas relevant tradable sectors are damaged.

Example 2: Downstream tradable sector. Now consider input-output linkage. In this case, foreign sectoral shocks can affect own and other sectors in the domestic economy. We see this point by using a 2-sector economy as illustrated in Figure 2. Assume good 1 is used as input in both sector 1 and 2, i.e., $\boldsymbol{W} = \boldsymbol{W}^f = \begin{bmatrix} 1 & 0 \\ 1 & 0 \end{bmatrix}$. Assume also that sector 1 is non-tradable whereas sector 2 is tradable (for example, non-manufacturing sectors, such as transportation and construction (non-tradable), providing inputs to manufacturing sectors (tradable)). Then, we obtain

$$\begin{bmatrix} dS_{1t} \\ dS_{2t} \end{bmatrix} = \begin{bmatrix} \bar{v}_1 \\ \bar{v}_2 \end{bmatrix} d(P_t C_t) + \begin{bmatrix} \bar{v}_1^f \\ \bar{v}_2^f \end{bmatrix} d(P_t^f C_t^f) - c \begin{bmatrix} (1-\alpha_1)(1-\alpha_2) & (1-\alpha_1)\alpha_1 \\ \alpha_1(1-\alpha_2) & \alpha_1^2 \end{bmatrix} \begin{bmatrix} d\ln A_{1t}^f \\ d\ln A_{2t}^f \end{bmatrix}, \tag{16}$$

where $c = \tilde{\theta}_2/\{\alpha_1(1+2\tilde{\theta}_2\alpha_1\alpha_2/S_2)(1+\alpha_1-\alpha_2)\}$. Conditional on aggregate consumption, both sector 1 and 2 productivity shocks affect domestic sectoral output. Sector 1 (upstream sector) is negatively affected by a foreign shock to sector 2 (downstream sector) $d\ln A_{2t}^f$. This is through the intermediate goods demand. Since domestic sector 2 shrinks as foreign sector 2 expands, intermediate goods demand for domestic sector 1 declines, which is not compensated by the foreign demand since sector 1 is non-tradable. The result is in contrast to Acemoglu et al. (2015), who show that a supply shock propagates only downstream under perfect competition, and supports the upstream result presented in Table 1.[3] The example highlights the role of non-tradable goods in the (upstream) shock propagation. Further, sector 1 is also negatively affected by foreign sector 1 shock, although it is non tradable. Foreign sector 1 shock initially propagates downstream foreign economy's input-output linkage, benefiting foreign sector 2 through lower input price. In turn, this will propagates upstream in the domestic economy's network through intermediate demand as described in (11). In this sense, non-tradable sectors are indirectly exposed to foreign competition through production network.

Example 3: Upstream tradable sector. Consider the same setting as example 2, but

[3] Baqaee (2018) finds that a supply shock can have upstream effects under imperfect competition. Our result holds under perfect competition with trade. Baqaee and Farhi (2024) point out spillover through households' demand complementarity among tradable and non-tradable goods, while our model's mechanism involves intermediate goods demand.

assume sector 2 is non-tradable. We obtain

$$\begin{bmatrix} dS_{1t} \\ dS_{2t} \end{bmatrix} = \begin{bmatrix} \bar{v}_1 \\ \bar{v}_2 \end{bmatrix} d(P_t C_t) + \begin{bmatrix} \bar{v}_1^f \\ \bar{v}_2^f \end{bmatrix} d(P_t^f C_t^f) - e \begin{bmatrix} d\ln A_{1t}^f \\ 0 \end{bmatrix}, \tag{17}$$

where $e = \{1 + (1 - 2\tilde{\xi}_1)(1 - \alpha_1)\}/[(\{1 + (1 - 2\tilde{\xi}_1)(1 - \alpha_1)\}^2 + 2\tilde{\xi}_1(1 - \tilde{\xi}_1)(D_1 + D_1^f)(\theta_1 - 1)\alpha_1/S_1)(1+\alpha_1-\alpha_2)]$. In this case, foreign sector 1's shock does not propagate to home sector 2 conditional on aggregate consumption. To interpret, under perfect competition, home and foreign sector 1 are seen as an integrated one sector. Shocks to them are fully offset within the sector, and does not affect downstream sector.

3.4 Consumption dynamics

Combining household's budget constraint and the Euler equation, along with the transversality condition, we obtain, to a first order,

$$\underbrace{d\ln C_t^{jh}}_{\text{Individual consumption}} = \underbrace{\omega^{jh} d\ln R_t}_{\text{Financial income}} + \underbrace{(1-\omega^{jh}) d\ln S_{jt}}_{\text{Labor income}}, \tag{18}$$

where $\omega^{jh} = W^{jh}/(W^{jh} + \frac{\beta}{1-\beta} S_j)$ is the wealth share. The derivation is provided in Appendix A. $d\ln C_t^{jh}$ is our measure of welfare. Notice that households differ in the wealth share ω^{jh} and sectoral labor income $S_{it} = (\alpha_i/h_i) P_{it} Y_{it}$. (18) highlights the importance of two sources of income: financial and labor income, whose impacts are amplified or mitigated by the wealth share ω^{jh}.

Median voter. Under majority voting, the median voter's preference becomes a political outcome. In (18), as the steady state is autarky (no globalization), $d\ln C_t^{jh} > 0$ implies support to globalization. We define the share of households who support globalization:

$$\frac{1}{n}\sum_{j=1}^{n}\int_0^{h_j} 1_{dC_t^{jh}>0} dh. \tag{19}$$

3.5 Sectoral lobbying

Next we incorporate sectoral lobbying into the model. Our setting is akin to Grossman and Helpman (1994) (GH, henceforth). As GH's model is partial equilibrium with fixed prices

except for tariffs, it does not have interactions between sectors, and tariffs are determined in the trade off between the benefits for a domestic producer and cost for consumers. In contrast, our model incorporates general equilibrium effects, and thus, one sector's lobbying, and resulting trade restrictions, affect other sectors' benefits or costs of globalization. Our model also considers dynamics between globalization and fragmentation over time, whereas GH's setting is static.

A politician's objective function U_t^{pj} is a weighted sum of social welfare and contributions received from lobbies:

$$U_t^{pj} = \eta u_t + (1-\eta) Q_t^j, \tag{20}$$

where $\eta \in [0,1]$ is the politician's preference parameter, $u_t = \sum_{j=1}^n u_t^j = \sum_{j=1}^n \int_0^{h_j} ((C_t^{jh})^{1-\gamma} - 1)/(1-\gamma) dh$ is social welfare, and Q_t^j is the contribution from lobby j. Depending on contributions, the politician has power to impose a sectoral trade restriction, thereby changing a tradable good to non-tradable, which can be achieved by imposing an infinitely high tariff, i.e., $\tau_i \to \infty$.

The lobbying sector's payoff, when political contribution succeeds in a trade restriction, is given by

$$U_t^j = u_t^j - Q_t^j. \tag{21}$$

Nash bargaining. Following Goldberg and Maggi (1999), we consider Nash bargaining between the government and lobbyists. They maximize joint surplus:

$$(U_t^{pj})^{1-\phi} \left(U_t^j\right)^{\phi}, \tag{22}$$

where ϕ is weight for lobbyists, which we will show shortly is irrelevant in equilibrium.[4] The FOC for Q_t^j yields

$$U_t^{pj} \propto U_t^j \propto \eta u_t + (1-\eta) u_t^j. \tag{23}$$

(23) indicates that contributions are determined so that the politician and lobbyists have a common objective to maximize the weighted sum of social welfare and lobbyists' welfare.

[4]We assume that the government cannot commit to a future policy, as a consequence of which lobbying and trade restrictions are determined each period.

Sectoral trade restrictions. Tradable sectors that would benefit from trade restriction form lobbies, while the government chooses to stop imports for sector $j \in L$, if it improves the objective function (23). These conditions are boiled down to

$$\underbrace{\Delta_t^{jj}}_{\text{Gain in sector } j} + \underbrace{\eta \sum_{i \neq j} \Delta_t^{ij}}_{\text{Gain in other sectors}} \geq 0, \tag{24}$$

$$\underbrace{\Delta_t^{jj}}_{\text{Gain in sector } j} > 0, \tag{25}$$

where $\Delta_t^{ij} = u_t^i|_{j \in N} - u_t^i|_{j \in T}$ is the impact of sector j's trade restriction on sector i. The condition (24) states that the gain from trade restriction should be large enough for successful lobbying, after taking into account the impacts on other sectors with different weights for other sectors. Notice that $\eta = 1$ corresponds to the case where a politician fully incorporates social welfare while $\eta = 0$ implies that they consider only the lobbying sector's payoff. (25) imply the incentive for sector j to engage in lobbying for trade restriction.

In a general equilibrium, there can be interactions across different sectors' lobbying. For instance, one sector's trade restriction affects other sectors' gains and losses from globalization, which may incentivize or disincentivize the lobbying activities of these sectors. We quantify these interactions in the next section.

4 Results

4.1 Calibration

We construct a sectoral dataset for the U.S. and China at an annual frequency from 1988 to 2023. The primary data sources are the KLEMS project for sectoral TFP $\boldsymbol{A}_t^f$ and factor inputs $\boldsymbol{X}_t^f$, which aggregate labor and capital inputs. Chinese data are sourced from the China Industrial Productivity (CIP) 4.0 Database, compiled by the Research Institute of Economy, Trade and Industry (RIETI), Hitotsubashi University, and Peking University Growth Lab. As the CIP database spans from 1988 to 2017, series after 2018 are interpolated by value added growth of respective sectors compiled by the National Bureau of Statistics of China. U.S. data are obtained from the Bureau of Economic Analysis (BEA). We harmonize sectoral classifications, constructing 32 sectors (19 tradable and 13 non-tradable) by mapping 63 U.S.

sectors and 34 Chinese sectors. The input-output matrix $\boldsymbol{W}$ and intermediate share $(\boldsymbol{I}-\boldsymbol{\alpha})$ are derived for 1997 data for the U.S. and for 1993 data for China, corresponding to the earliest available input-output tables for each country. Sectoral outputs in the steady state $\boldsymbol{S}$ and $\boldsymbol{S}^f$ are directly taken from the KLEMS data. Final consumption share $\boldsymbol{v}$ is taken from the corresponding shares in the Personal Consumption Expenditures for the U.S., while $\boldsymbol{v}^f$ and $\boldsymbol{\xi}$ are computed to satisfy the market clearing conditions in the steady state. Sectoral trade elasticities $\boldsymbol{\theta}$ are taken from Caliendo and Parro (2015) and Baqaee and Farhi (2024). We assume no tariffs in the steady state and capture actual tariffs by $d\ln\boldsymbol{\tau}_t$ and $d\ln\boldsymbol{\tau}_t^f$ in the model in a later analysis.

The wealth share ω^{jh} for U.S. households is calibrated using data from the Survey of Consumer Finance (SCF), compiled by the Federal Reserve Bank of New York. We use the net worth and wage income as measures of W and S in the model. The SCF categorizes employment into 7 broad sectors. For each sector, we compute percentiles of household wealth sahre, defined as $\omega^{jh}=W_h/(W_h+\beta/(1-\beta)S_j)$, with a discount factor of $\beta=0.96$, using 1997 data. These estimates are then mapped to corresponding sectors in the KLEMS dataset. Sectoral labor income S_j and sectoral household employment shares h_j are obtained from the average hourly earnings and full-time worker-equivalent employment data, compiled by the Bureau of Labor Statistics (BLS). The risk aversion parameter is set to $\gamma=1$, and the weight assigned to non-lobbying sectors η is set to 1, implying equal weighting between lobbying and non-lobbying sectors.

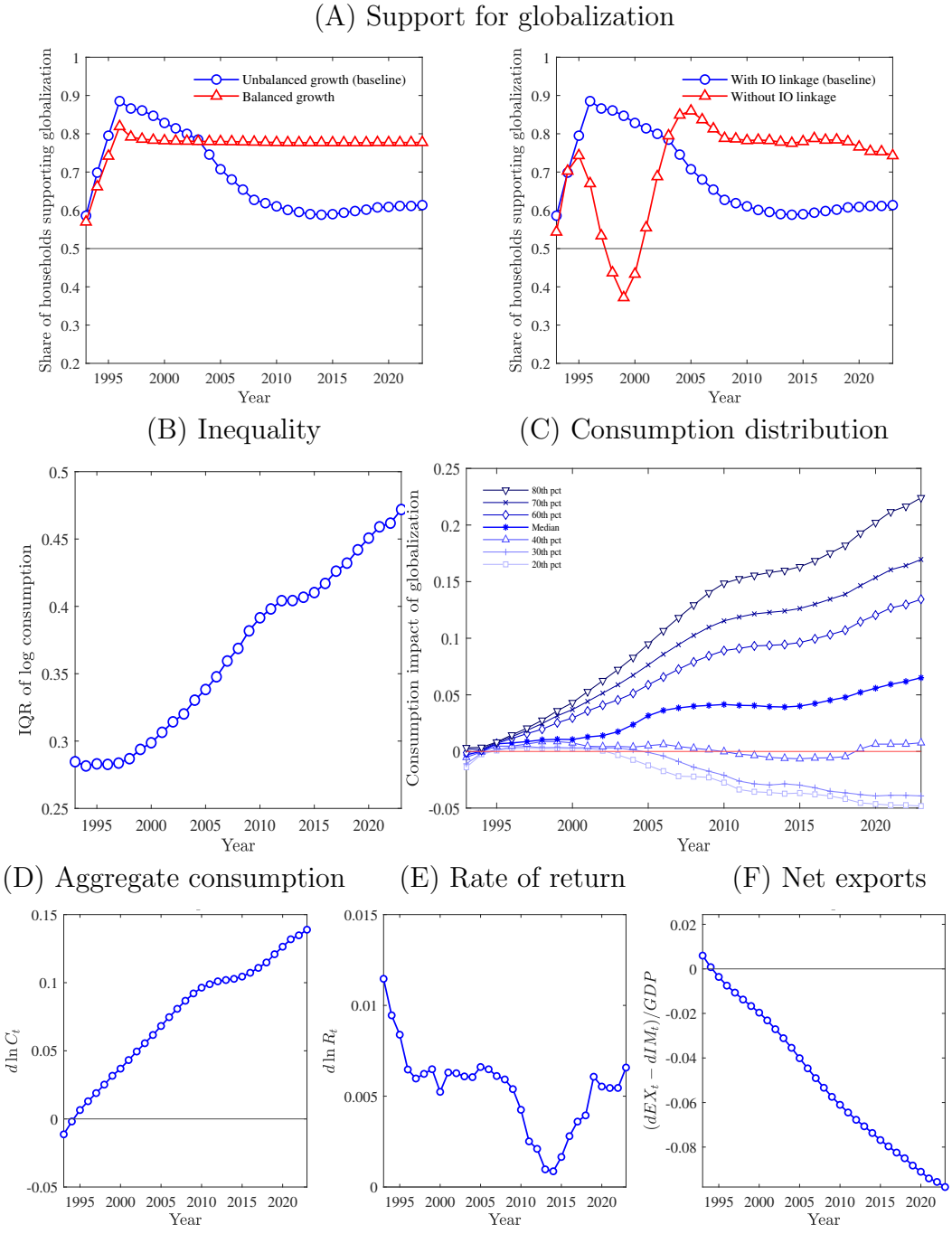
4.2 Assessing the economic impact of Chinese economic growth

We examine the impact of Chinese economic growth by feeding the calibrated foreign TFP $\boldsymbol{A}_t^f$ and factor inputs $\boldsymbol{X}_t^f$ into the model.

Aggregate impact and support for globalization

Figure 3 presents model-implied outcomes while shutting off tariffs $\boldsymbol{\tau}_t$ and $\boldsymbol{\tau}_t^f$ to start, highlighting the U.S. economic impact of Chinese growth, interpreted as globalization in our context. Panel (A) displays the share of households that benefit from globalization—i.e., those with $dC_t^{hj}>0$—and therefore support globalization in the model simulation. Support for globalization rose sharply in the early 1990s, peaking at 90%, before steadily declining to 60% by the early 2010s. As we show in Panels (B), (C), and (D), this trend in support for globalization is driven by the increasingly uneven distributional consequences of globalization.

Figure 3: Effects of globalization: Support, inequality, consumption, returns, and net exports



Notes: The model is simulated without tariffs. A 5-year centered moving average is shown. The model predictions from the baseline setting are indicated by blue-circled lines, while alternative model settings are shown with red-triangle lines. For the alternative specification, "balanced growth" assumes all sectoral growth are equal to the aggregate growth rate, i.e., $d \ln A_{it}^f = d \ln A_t^f$ and $d \ln X_{it}^f = d \ln X_t^f$; "Without IO linkage" removes the input-output linkage by assuming $\boldsymbol{\alpha} = \boldsymbol{\alpha}^f = \boldsymbol{I}$.

Two key features drive this time-varying support: (i) the heterogeneous pace of Chinese

sectoral growth and (ii) input-output linkages. Without (i), the distribution of "winners" and "losers" from globalization remains unchanged over time—demonstrated by an alternative balanced growth specification (all sectoral growth is equal to the aggregate growth rate, i.e., $d \ln A_{it}^f = d \ln A_t^f$ and $d \ln X_{it}^f = d \ln X_t^f$, as examined by Di Giovanni et al., 2014)—leading to a nearly constant share of globalization support. In constructing a microfounded framework that highlights economic inequality as a key driver of backlashes against globalization, we believe that generating time-varying support for globalization—consistent with narratives in news and policy writings—is a novel contribution to the existing literature. Without (ii), increasing imports from China do not necessarily harm non-tradable sectors, which employ the vast majority of workers—an important feature of the U.S. economy.

In contrast to the declining trend in overall support, Panel (D) illustrates that aggregate consumption continues to grow as a result of globalization, albeit with a diminishing but still positive impact on the rate of return, as displayed in Panel (E). The decline in asset returns following the Global Financial Crisis (GFC) likely reflects the deceleration of China's economic growth. Furthermore, the model replicates the observed deterioration in the trade balance as a share of GDP in Panel (F), consistent with empirical data.

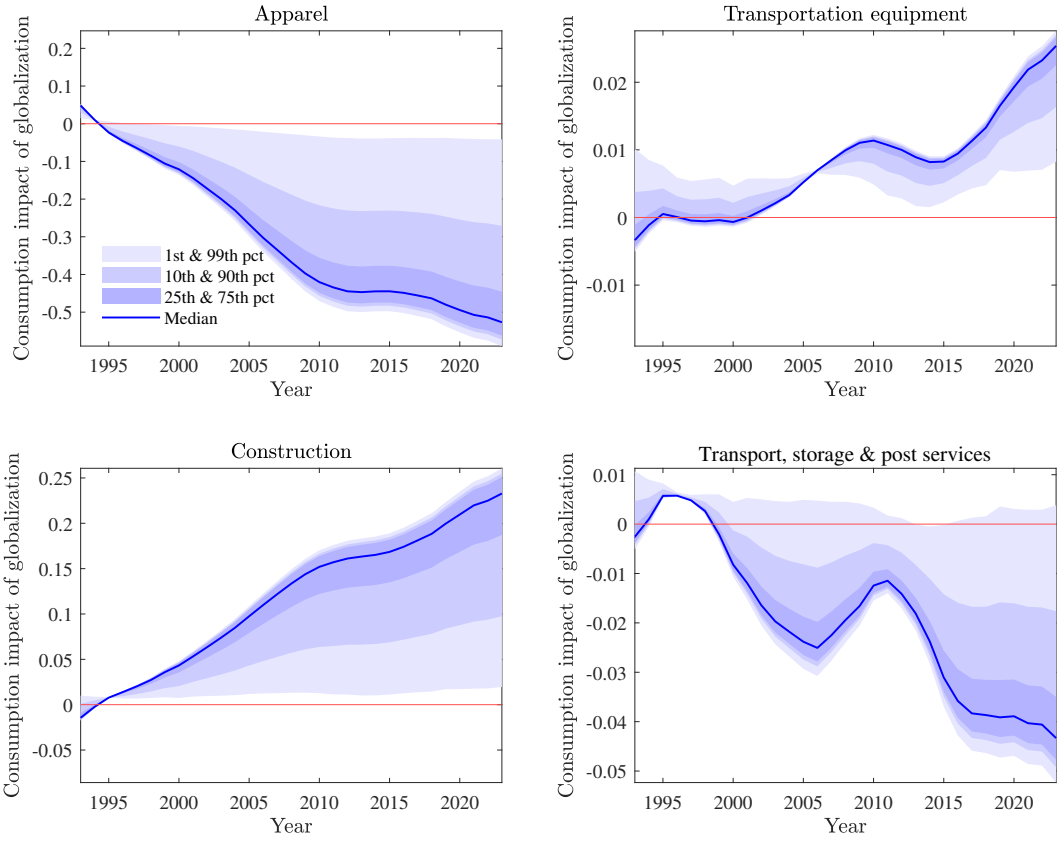
The stark contrast between substantial aggregate gains from globalization, as shown in Panel (D), and the shrinking share of benefiting households, with these gains increasingly concentrated among a smaller fraction of the population, implied by Panels (B) and (C), highlighting the need to account for sectoral and household heterogeneity when analyzing political support for globalization or economic fragmentation.

Sectoral impact and consumption distribution

Figure 4 illustrates the consumption impacts of globalization across selected sectors, highlighting key mechanisms in the model. Full sectoral results are provided in the Appendix.

The adverse effects of foreign productivity and factor input growth on the domestic economy are particularly pronounced in tradable goods sectors. For instance, in apparel (top-left panel), rapid growth of the Chinese industry since the 1990s led to significant displacement of U.S. domestic production. However, globalization can also benefit tradable goods sectors through input-output linkages. For example, the transportation equipment sector (top-right panel) relies on numerous intermediate inputs, which become more accessible at lower costs as foreign industries expand, with its relatively low trade elasticity further reinforcing this benefit.

Figure 4: Effects of globalization: Sectoral consumption

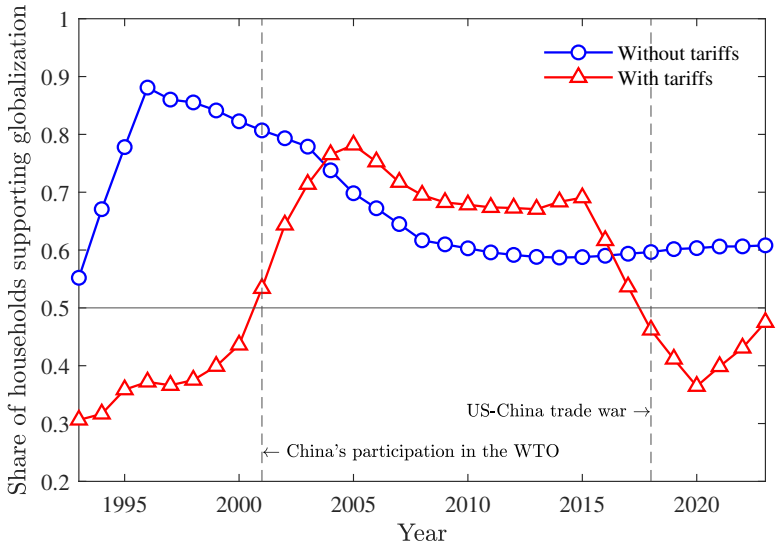


Notes: The model is simulated without tariffs. A 5-year centered moving average is shown.

In non-manufacturing sectors, which are not directly exposed to foreign competition, households generally benefit from globalization through two channels: lower costs of intermediate inputs due to increased trade and more favorable sectoral output prices relative to tradables. This is evident in the construction sector (bottom-left panel). However, some non-tradable sectors may experience negative spillovers if they supply inputs to tradable sectors that face heightened foreign competition. For instance, as discussed in Example 2 of Section 3.3, the transport, storage, and postal services sector (bottom-right panel) is deeply interconnected with manufacturing, providing critical services to the sector. As manufacturing contracts under competitive pressures from globalization, reduced intermediate input demand negatively affects this sector as well.

Moreover, differences in wealth holdings introduce additional heterogeneity in globalization's impact. Financial asset not only generates financial income but also mitigates the adverse effects on labor income, creating within-sector disparities. In the transport, storage, and postal services sector, for example, despite the overall negative impact of globalization,

Figure 5: Impact of tariffs on globalization support



Notes: The model is simulated with tariffs. A 5-year centered moving average is shown.

a subset of households with substantial financial assets experiences net positive gains.

4.3 Assessing the economic impact of tariffs

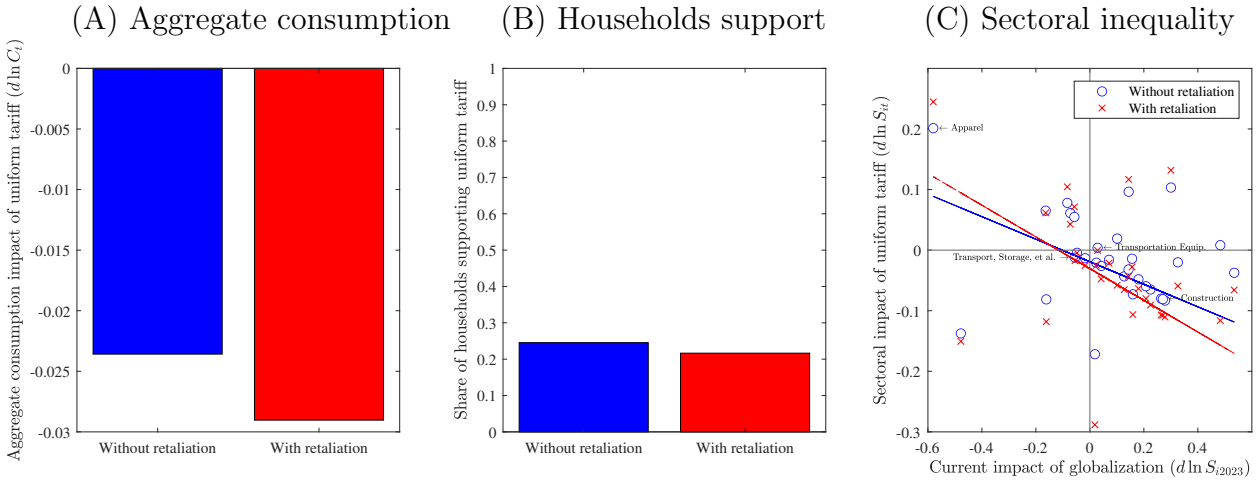
Support for globalization

In this section, we examine how changes in tariffs over time affect support for globalization. We calibrate tariff rates for individual tradable sectors τ_{it} and τ_{it}^{f} using the tariff data, see Figure A-3, compiled by the World Integrated Trade Solution (WITS) and Fajgelbaum et al. (2019). We feed these tariffs into the model on top of the calibrated TFP and factor inputs used in the previous subsection.

Figure 5 clearly illustrates the cost of tariffs and their impact on globalization support. We emphasize that support for globalization declined over time due to heterogeneous sectoral economic growth in China, as more industries and workers faced increased competition. To highlight this mechanism, we previously shut off tariffs. When tariffs are introduced, the model predicts a different pattern of globalization support.

We note that, as shown in Figure A-3, tariffs declined sharply around China's WTO accession, leading to a significant rise in globalization support. This increase coincided with lower tariff rates in China but later reversed during the 2018–19 U.S.-China trade war, when both countries imposed tariffs on a wide range of products. In between, support remained

Figure 6: Counterfactual analysis of uniform tariffs



Notes: Uniform tariff of 10% on all tradable goods is considered. Tariff revenues are assumed to be rebated to households in a lump-sum manner. In panel (C), fitted lines are shown based on the weighted least square.

somewhat higher than in the absence of tariffs, suggesting that existing tariffs helped shield certain sectors from foreign competition. However, after the 2018-19 trade war, the new tariffs reversed the previous trend, leading to a sharp decline in globalization support. This shift is evident in Figure 5, where the red line falls below the blue line. We argue that this pattern of globalization support aligns well with the empirical literature on backlash against globalization, as summarized in Colantone et al. (2022) and Rodrik (2021).

Counterfactual tariff experiment

We further explore the effects of additional tariffs in a counterfactual analysis. Specifically, we consider a uniform tariff increase of 10% on all tradable goods, i.e., $d \ln \tau_{it} = 0.1$ for all $i \in T$.

Figure 6 demonstrates that such a uniform tariff leads to a sizable negative impact on aggregate consumption. Furthermore, if the same magnitude of retaliatory tariffs, i.e., $d \ln \tau_{it}^{f} = 0.1$ for all $i \in T$, is imposed by the foreign government, the negative impact will be even larger, see Panel (A). The magnitude is substantively larger than prior studies. For instance, Fajgelbaum et al. (2019) estimated that the cost of the higher tariffs in the 2018-19 US China trade war was 0.04% of GDP. A potential reason is that we take into account sectoral network including non-tradable sectors and thus the cost of tariffs also propagates to non-tradable sectors. We verified that without production network, the aggregate consumption impact of a uniform tariff is +0.05% without retaliation tariffs and -0.15% with them,

in line with Fajgelbaum et al. (2019)'s estimates.

Importantly, the key takeaway is that the uniform tariff policy is not supported by households, see Panel (B). While tariffs on a sector's own goods may improve income within that sector, their effects vary across tradable sectors. Additionally, uniform tariffs generally reduce household income due to negative spillovers to other sectors.

However, the uniform tariff policy mitigates inequality by benefiting sectors that have been adversely affected by globalization. Panel (C) illustrates the sectoral impact of the uniform tariff relative to the current effects of globalization. The clearly negative slope indicates that sectors currently negatively (positively) impacted by globalization gain (lose) from the uniform tariff policy.

4.4 Understanding the role of lobbying in trade policy formation

How do such harmful tariffs emerge through political processes? We analyze this question by examining sectoral lobbying in our model.

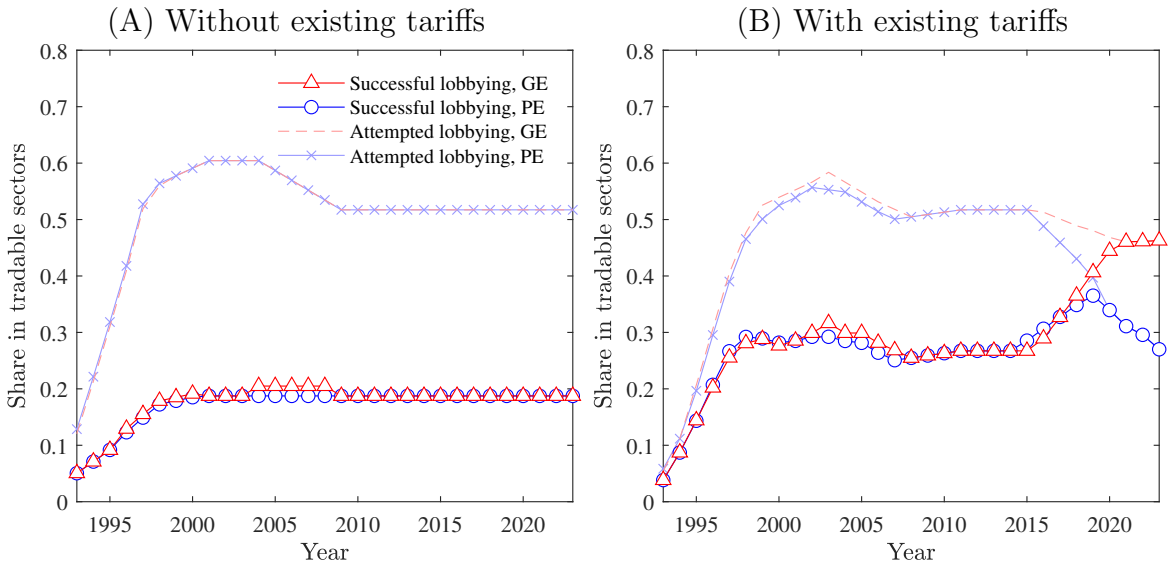
In Figure 7, we simulate sectoral lobbying activities within the calibrated model. In the "PE" case, payoffs from lobbying activities are measured relative to a benchmark where no sector conducts lobbying, thereby shutting out potential interactions among sectors. In the "GE" case, on the other hand, payoffs are measured relative to the case that takes into account other sectors' actual lobbying.[5] For this analysis, we calibrate the weighting parameter η to 1, implying that the government fully accounts for social welfare, leading to a distinction between "attempted" and "successful" lobbying. If, instead, the government ignores social welfare and considers only contributions from lobbies—and thus their payoffs—all attempted lobbying efforts are accepted.

Panel (A) of Figure 7 indicates that, without existing tariffs (e.g., $d\ln\boldsymbol{\tau}_t = d\ln\boldsymbol{\tau}_t^f = 0$), successful lobbying sectors that satisfy conditions (24) and (25) remain around 20% of tradable sectors over time, whereas attempted lobbying sectors that satisfy only condition (25) and thus have incentives to lobby amount to more than 50% of tradable sectors. In this case, the interactions across individual sectors' lobbying (differences between the "PE" and "GE" cases) are marginal.

The share of successful lobbying is considerably higher when actual tariffs are taken into

[5]Computing the GE case involves numerical iterations to find a fixed point for sectoral lobbying. That is, we start from a guess over each sector's lobbying activity; given that guess, we simulate each sector's lobbying incentive and see whether it is accepted by the government; using the outcome, we update the initial guess. We continue these iterations until convergence.

Figure 7: Sectoral lobbying outcomes: Tariff vs. no-tariff scenarios



Notes: In the "PE" case, payoffs from lobbying activities are measured relative to a benchmark where no sector conducts lobbying, thereby shutting out potential interactions among sectors. In the "GE" case, on the other hand, payoffs are measured taking into accout other sectors' actual lobbying.

account, as shown in Panel (B). We first examine attempted lobbying (red-dashed and blue-cross lines) to highlight the effect of general equilibrium considerations, focusing specifically on the period after the 2018-19 trade war. The tariffs imposed during this period helped protect certain sectors, thereby reducing incentives for lobbying (blue line with crosses). However, in the GE case—where other sectors' lobbying outcomes influence a sector's own lobbying decision—additional trade restrictions erode these gains, sustaining lobbying incentives. As a result, the share of successful lobbying has sharply increased to nearly 50% in recent years (dashed red line). This finding highlights the role of strategic complementarity in lobbying dynamics. Intuitively, strategic complementarity arises from the production network. A trade restriction in one sector (e.g., steel) raises the price of the protected good, which then propagates to downstream sectors (e.g., vehicles) that use it as an intermediate input. The higher input price intensifies competition for these downstream sectors against their foreign counterparts, strengthening their incentives to lobby for additional import protection.

Next, we compare attempted versus successful lobbying in the GE case (red-dashed and red-triangle lines). The difference between these lines captures the role of social welfare considerations, which has declined substantially in recent years. With the gains from globalization already diminished for other sectors due to high existing tariffs, the complete shutdown of a sector is now less harmful than before, leading to the acceptance of attempted

lobbying. A form of dynamic complementarity between existing and newly imposed trade restrictions, acting as a reinforcing mechanism, underscores why increasing tariffs remain highly distortionary—enabling more affected sectors to secure successful lobbying efforts. Note that although welfare is clearly higher without tariffs or trade restrictions, sectors have no incentive to lobby for the removal of existing restrictions.

The counterfactual scenario with a uniform tariff policy in Figure 6 suggests the limiting case, where all sectors successfully lobby for protection, reducing sectoral inequality but at the cost of a substantial decline in overall welfare. Since lobbying-driven trade restrictions effectively insulate sectors from trade—converting tradable goods into nontradable ones—the welfare impact shown in Figure 6 may be understated.

5 Conclusion

This paper demonstrates how fragmentation emerges endogenously from the unequal distribution of globalization's gains.

We achieve this in two steps. First, our empirical analysis establishes a causal link between economic discontent and policy shifts, showing that households exposed to trade competition with lower wealth are more likely to oppose globalization, while wealthier households—who benefit from financial integration—remain supportive. At the firm level, we document that trade-affected industries engage in lobbying, reinforcing protectionist pressures.

Next, building on these empirical findings, we develop a Ricardian trade model with input-output linkages, heterogeneous households, and endogenous sectoral lobbying. A key feature is dual-layer income heterogeneity, where households' income differs in labor and financial wealth across sectors and within households, leading to asymmetric effects of globalization and creating distinct winners and losers. For example, workers in tradable sectors face wage pressures from import competition, while wealthier households in the same sector might still benefit through financial globalization. This asymmetry widens consumption dispersion and concentrates inequality within a small fraction of the population. Our calibrated model replicates the observed decline in public support for globalization—from its peak in the early 2000s to much lower levels in the past decade—reflecting shifts in sectoral foreign exposure, wealth distribution, and trade policies.

Trade-affected sectors drive lobbying efforts, which exhibit strategic complementarities, where one sector's lobbying influences others through input-output linkages, and dynamic

complementarities, where past trade restrictions lower the cost of further protection. These mechanisms create a self-reinforcing cycle of lobbying-induced trade barriers, sustaining fragmentation even when globalization remains beneficial in the aggregate. A welfare implication of this process is that while trade restrictions reduce sectoral disparities, they significantly lower aggregate consumption and economic efficiency. The model highlights how fragmentation, once set in motion, can escalate endogenously through lobbying dynamics, making globalization's reversal not just a policy choice but an outcome of economic and political forces.

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Appendix

A Model Solution

A.1 Sectoral output and aggregate consumption (10)–(12)

Households. The cost minimization over the basket (1)–(2) yields

$$C_{it}^{Hjh} = \left(\frac{P_{it}}{\lambda_{it}\xi_i}\right)^{-\theta_i} C_{it}^{jh}, \tag{A-1}$$

$$C_{it}^{Fjh} = \left(\frac{\tau_{it}P_{it}^{f}}{\lambda_{it}(1-\xi_i)}\right)^{-\theta_i} C_{it}^{jh}, \tag{A-2}$$

$$C_{it}^{jh} = v_i \left(\frac{\lambda_{it}}{P_t}\right)^{-1} C_t^{jh}, \tag{A-3}$$

$$P_t = \prod_{i=1}^{n} (\lambda_{it})^{v_i}, \tag{A-4}$$

$$\lambda_{it} = \left(\xi_i^{\theta_i} P_{it}^{1-\theta_i} + (1-\xi_i)^{\theta_i} (\tau_{it}P_{it}^{f})^{1-\theta_i}\right)^{\frac{1}{1-\theta_i}}, \tag{A-5}$$

where τ_i is an iceberg trade cost and λ_{it} is a domestic price, which is a composite of home- and foreign-produced goods prices.

The FOC for the intertemporal decision (4)–(5) leads to the consumption Euler equation:

$$1 = \mathbb{E}_t \left[\beta \left(\frac{C_{t+1}^{jh}}{C_t^{jh}}\right)^{-\gamma} \tilde{R}_{t+1}\right], \tag{A-6}$$

where $\tilde{R}_{t+1} = R_{t+1}/(P_{t+1}/P_t)$ is the real rate of return.

Firms. Profit maximization leads to

$$Y_{ijt}^{H} = \left(\frac{P_{jt}}{\lambda_{jt}\xi_j}\right)^{-\theta_j} Y_{ijt}, \tag{A-7}$$

$$Y_{ijt}^{F} = \left(\frac{\tau_{jt}P_{jt}^{f}}{\lambda_{jt}(1-\xi_j)}\right)^{-\theta_j} Y_{ijt}, \tag{A-8}$$

$$E_{it}X_{it} = \alpha_i P_{it} Y_{it}, \tag{A-9}$$

$$\lambda_{jt} Y_{ijt} = (1-\alpha_i) w_{ij} P_{it} Y_{it}, \tag{A-10}$$

Equation (A-9) indicates that sectoral earnings $E_{it}X_{it}$ are proportional to sales $P_{it}Y_{it}$.

Foreign households and firms. Given the symmetric structure, the FOC are given by

$$C_{it}^{fFjh} = \left(\frac{P_{it}^f}{\lambda_{it}^f \xi_i^f}\right)^{-\theta_i} C_{it}^{fjh}, \tag{A-11}$$

$$C_{it}^{fHjh} = \left(\frac{\tau_{it}^f P_{it}}{\lambda_{it}^f (1-\xi_i^f)}\right)^{-\theta_i} C_{it}^{fjh}, \tag{A-12}$$

$$C_{it}^{fjh} = v_i^f \left(\frac{\lambda_{it}^f}{P_t^f}\right)^{-1} C_t^{fjh}, \tag{A-13}$$

$$P_t^f = \prod_{i=1}^{n} \left(\lambda_{it}^f\right)^{v_i^f}, \tag{A-14}$$

$$\lambda_{it}^f = \left((\xi_i^f)^{\theta_i}(P_{it}^f)^{1-\theta_i} + (1-\xi_i^f)^{\theta_i}(\tau_{it}^f P_{it})^{1-\theta_i}\right)^{\frac{1}{1-\theta_i}}, \tag{A-15}$$

$$1 = \mathbb{E}_t\left[\beta\left(\frac{C_{t+1}^{fjh}}{C_t^{fjh}}\right)^{-\gamma} \tilde{R}_{t+1}^f\right], \tag{A-16}$$

$$Y_{ijt}^{fF} = \left(\frac{P_{jt}^f}{\lambda_{jt}^f \xi_j^f}\right)^{-\theta_j} Y_{ijt}^f, \tag{A-17}$$

$$Y_{ijt}^{fH} = \left(\frac{\tau_{jt}^f P_{jt}}{\lambda_{jt}^f (1-\xi_j^f)}\right)^{-\theta_j} Y_{ijt}^f, \tag{A-18}$$

$$E_{it}^f X_{it}^f = \alpha_i^f P_{it}^f Y_{it}^f, \tag{A-19}$$

$$\lambda_{jt}^f Y_{ijt}^f = (1-\alpha_i^f) w_{ij}^f P_{it}^f Y_{it}^f, \tag{A-20}$$

Market clearing. Substituting the FOCs into the market clearing conditions yield

$$\xi_i^{\theta_i}\left(\frac{P_{it}}{\lambda_{it}}\right)^{-\theta_i+1} D_{it} + (1-\xi_i^f)^{\theta_i}(\tau_{it}^f)^{-\theta_i}\left(\frac{P_{it}}{\lambda_{it}^f}\right)^{-\theta_i+1} D_{it}^f = S_{it}, \tag{A-21}$$

$$(1-\xi_i)^{\theta_i}\tau_{it}^{-\theta_i}\left(\frac{P_{it}^f}{\lambda_{it}}\right)^{-\theta_i+1} D_{it} + (\xi_i^f)^{\theta_i}\left(\frac{P_{it}^f}{\lambda_{it}^f}\right)^{-\theta_i+1} D_{it}^f = S_{it}^f, \tag{A-22}$$

$$\text{where} \quad D_{it} = v_i P_t C_t + \sum_{j=1}^{n}(1-\alpha_j) w_{ji} S_{jt}, \tag{A-23}$$

$$D_{it}^f = v_i^f P_t^f C_t^f + \sum_{j=1}^{n}(1-\alpha_j^f) w_{ji}^f S_{jt}^f. \tag{A-24}$$

$S_{it} = P_{it}Y_{it}$ is nominal output and D_{it} and D_{it}^f collect final and intermediate goods demand in the home and foreign economies, respectively.

The first-order approximation. Consider the first-order approximation around $P_i = P_i^f$. Variables without t subscript denote steady-state values. (A-21)–(A-24) lead to

$$-\left\{\tilde{\xi}_i(1-\tilde{\xi}_i)D_i + \tilde{\xi}_i^f(1-\tilde{\xi}_i^f)(\tau_i^f)^{-1}D_i^f\right\}(\theta_i-1)(d\ln P_{it} - d\ln P_{it}^f) + \tilde{\xi}_i D_i d\ln D_{it} + (1-\tilde{\xi}_i^f)(\tau_i^f)^{-1}D_i^f d\ln D_{it}^f$$
$$+\tilde{\xi}_i(1-\tilde{\xi}_i)D_i(\theta_i-1)d\ln\tau_{it} - \left\{-(1-\tilde{\xi}_i^f)(\theta_i-1)+\theta_i\right\}(1-\tilde{\xi}_i^f)(\tau_i^f)^{-1}D_i^f d\ln\tau_{it}^f = S_i d\ln S_{it}, \tag{A-25}$$

$$\left\{\tilde{\xi}_i(1-\tilde{\xi}_i)\tau_i^{-1}D_i + \tilde{\xi}_i^f(1-\tilde{\xi}_i^f)D_i^f\right\}(\theta_i-1)(d\ln P_{it} - d\ln P_{it}^f) + (1-\tilde{\xi}_i)\tau_i^{-1}D_i d\ln D_{it} + \tilde{\xi}_i^f D_i^f d\ln D_{it}^f$$
$$+\tilde{\xi}_i^f(1-\tilde{\xi}_i^f)D_i^f(\theta_i-1)d\ln\tau_{it}^f - \left\{-(1-\tilde{\xi}_i)(\theta_i-1)+\theta_i\right\}(1-\tilde{\xi}_i)\tau_i^{-1}D_i d\ln\tau_{it} = S_i^f d\ln S_{it}^f, \tag{A-26}$$

where $$D_i d\ln D_{it} = v_i d\ln(P_t C_t) + \sum_{j=1}^n (1-\alpha_j) w_{ji} S_j d\ln S_{jt}, \tag{A-27}$$

$$D_i^f d\ln D_{it}^f = v_i^f P^f C^f d\ln(P_t^f C_t^f) + \sum_{j=1}^n (1-\alpha_j^f) w_{ji}^f S_j^f d\ln S_{jt}^f. \tag{A-28}$$

$\tilde{\xi}_i = \xi_i^{\theta_i}/(\xi_i^{\theta_i} + (1-\xi_i)^{\theta_i}\tau_i^{1-\theta_i})$ and $\tilde{\xi}_i^f = (\xi_i^f)^{\theta_i}/((\xi_i^f)^{\theta_i} + (1-\xi_i^f)^{\theta_i}(\tau_i^f)^{1-\theta_i})$ are the steady-state share of domestic goods. The derivation used the first-order approximation of (A-5) and (A-15):

$$d\ln\lambda_{it} = \tilde{\xi}_i d\ln P_{it} + (1-\tilde{\xi}_i)(d\ln P_{it}^f + d\ln\tau_{it}), \tag{A-29}$$

$$d\ln\lambda_{it}^f = \tilde{\xi}_i^f d\ln P_{it}^f + (1-\tilde{\xi}_i^f)(d\ln P_{it} + d\ln\tau_{it}^f), \tag{A-30}$$

We also assume $\tau_i = \tau_i^f = 1$ in the baseline case. In a matrix form,

$$-\left\{\tilde{\boldsymbol{\xi}}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}+\tilde{\boldsymbol{\xi}}^f(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f\right\}(\boldsymbol{\theta}-\boldsymbol{I})(d\ln\boldsymbol{P}_t-d\ln\boldsymbol{P}_t^f)+\tilde{\boldsymbol{\xi}}\boldsymbol{D}d\ln\boldsymbol{D}_t+(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f d\ln\boldsymbol{D}_t^f$$
$$+\tilde{\boldsymbol{\xi}}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}(\boldsymbol{\theta}-\boldsymbol{I})d\ln\boldsymbol{\tau}_t-\left\{-(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)(\boldsymbol{\theta}-\boldsymbol{I})+\boldsymbol{\theta}\right\}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f d\ln\boldsymbol{\tau}_t^f=\boldsymbol{S}d\ln\boldsymbol{S}_t, \tag{A-31}$$

$$\left\{\tilde{\boldsymbol{\xi}}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}+\tilde{\boldsymbol{\xi}}^f(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f\right\}(\boldsymbol{\theta}-\boldsymbol{I})(d\ln\boldsymbol{P}_t-d\ln\boldsymbol{P}_t^f)+(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}d\ln\boldsymbol{D}_t+\tilde{\boldsymbol{\xi}}^f\boldsymbol{D}^f d\ln\boldsymbol{D}_t^f$$
$$+\tilde{\boldsymbol{\xi}}^f(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f(\boldsymbol{\theta}-\boldsymbol{I})d\ln\boldsymbol{\tau}_t^f-\left\{-(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})(\boldsymbol{\theta}-\boldsymbol{I})+\boldsymbol{\theta}\right\}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}d\ln\boldsymbol{\tau}_t=\boldsymbol{S}^f d\ln\boldsymbol{S}_t^f, \tag{A-32}$$

where $$\boldsymbol{D}d\ln\boldsymbol{D}_t=\boldsymbol{v}PCd\ln(P_tC_t)+(\boldsymbol{I}-\boldsymbol{\alpha})\boldsymbol{W}'\boldsymbol{S}d\ln\boldsymbol{S}_t, \tag{A-33}$$

$$\boldsymbol{D}^f d\ln\boldsymbol{D}_t^f=\boldsymbol{v}^f P^f C^f d\ln(P_t^f C_t^f)+(\boldsymbol{I}-\boldsymbol{\alpha}^f)\boldsymbol{W}^{f'}\boldsymbol{S}^f d\ln\boldsymbol{S}_t^f. \tag{A-34}$$

Combining (A-31) and (A-32) yields

$$\boldsymbol{D}d\ln\boldsymbol{D}_t+\boldsymbol{D}^f d\ln\boldsymbol{D}_t^f-(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}d\ln\boldsymbol{\tau}_t-(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f d\ln\boldsymbol{\tau}_t^f=\boldsymbol{S}d\ln\boldsymbol{S}_t+\boldsymbol{S}^f d\ln\boldsymbol{S}_t^f, \tag{A-35}$$

or

$$\boldsymbol{v}PCd\ln(P_tC_t)+\boldsymbol{v}^f P^f C^f d\ln(P_t^f C_t^f)-(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}d\ln\boldsymbol{\tau}_t-(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f d\ln\boldsymbol{\tau}_t^f$$
$$=\boldsymbol{V}'^{-1}\boldsymbol{S}d\ln\boldsymbol{S}_t+\boldsymbol{V}^{f'-1}\boldsymbol{S}^f d\ln\boldsymbol{S}_t^f, \tag{A-36}$$

where $\boldsymbol{V}=\{\boldsymbol{I}-(\boldsymbol{I}-\boldsymbol{\alpha})\boldsymbol{W}\}^{-1}$ and $\boldsymbol{V}^f=\{\boldsymbol{I}-(\boldsymbol{I}-\boldsymbol{\alpha}^f)\boldsymbol{W}^f\}^{-1}$ are the Leontief inverse.

Substituting (A-36) back to (A-31) yields

$$\underbrace{\boldsymbol{S}d\ln\boldsymbol{S}_t}_{\text{Output}}=\underbrace{\tilde{\boldsymbol{V}}'}_{\text{Network}}\Bigg\{\underbrace{-\tilde{\boldsymbol{\theta}}}_{\text{Elasticity}}\underbrace{(d\ln\boldsymbol{P}_t-d\ln\boldsymbol{P}_t^f)}_{\text{Relative price}}\underbrace{+\tilde{\boldsymbol{v}}PCd\ln(P_tC_t)}_{\text{Home aggregate demand}}\underbrace{+\tilde{\boldsymbol{v}}^f P^f C^f d\ln(P_t^f C_t^f)}_{\text{Foreign aggregate demand}}$$
$$\underbrace{+\boldsymbol{\eta}d\ln\boldsymbol{\tau}_t-\boldsymbol{\eta}^f d\ln\boldsymbol{\tau}_t^f}_{\text{Tariff}}\Bigg\}, \tag{A-37}$$

where

$$\tilde{\boldsymbol{V}}'=\underbrace{\boldsymbol{V}'}_{\text{Production network}}\underbrace{\left\{\boldsymbol{I}+(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})(\boldsymbol{V}'-\boldsymbol{I})+(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)(\boldsymbol{V}^{f'}-\boldsymbol{I})\right\}^{-1}}_{\text{Effect of trade}}$$

and

$$\tilde{\boldsymbol{\theta}} = \left\{ \underbrace{\tilde{\boldsymbol{\xi}}}_{\frac{\partial(d\ln \boldsymbol{P}_t - d\ln \boldsymbol{\lambda}_t)}{\partial(d\ln \boldsymbol{P}_t - d\ln \boldsymbol{P}_t^f)}} \underbrace{(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}}_{\text{Imports}} + \underbrace{\tilde{\boldsymbol{\xi}}^f}_{\frac{\partial(d\ln \boldsymbol{P}_t - d\ln \boldsymbol{\lambda}_t^f)}{\partial(d\ln \boldsymbol{P}_t - d\ln \boldsymbol{P}_t^f)}} \underbrace{(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f}_{\text{Exports}} \right\} (\boldsymbol{\theta}-\boldsymbol{I})$$

are the Leontief inverse and demand elasticity, respectively, adjusted with trade. $\tilde{\boldsymbol{V}}$ reflects propagation through domestic production net work $\boldsymbol{V}$, but the impact is mitigated as the imported goods part $(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})$ falls out from domestic propagation. $\tilde{\boldsymbol{\theta}}$ is adjusted with the amounts of imports and exports ($(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}$ and $(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f$) and rescaled to the impact of the home and foreign price differential ($\tilde{\boldsymbol{\xi}}$ and $\tilde{\boldsymbol{\xi}}^f$).

$\tilde{\boldsymbol{v}} = \left\{\tilde{\boldsymbol{\xi}} + (\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)(\boldsymbol{V}^{f'}-\boldsymbol{I})\right\}\boldsymbol{v}$ and $\tilde{\boldsymbol{v}}^f = (\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{V}^{f'}\boldsymbol{v}^f$ represent sectoral elasticity with respect to aggregate demand. $\boldsymbol{\eta} = \left\{\tilde{\boldsymbol{\xi}}(\boldsymbol{\theta}-\boldsymbol{I}) - (\boldsymbol{I}-\tilde{\boldsymbol{\xi}})(\boldsymbol{V}^{f'}-\boldsymbol{I})\right\}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}$ and $\boldsymbol{\eta}^f = \left\{\tilde{\boldsymbol{\xi}}^f(\boldsymbol{\theta}-\boldsymbol{I}) + (\boldsymbol{I}-\tilde{\boldsymbol{\xi}})(\boldsymbol{V}^{f'}-\boldsymbol{I}) + \boldsymbol{\theta}\right\}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f$. (A-37) indicates that sectoral outputs are inversely related to the relative price between home and foreign goods while positively affected by home and foreign aggregate demand, which is amplified by production network. The sign of $\boldsymbol{\eta}$ is ambiguous as higher tariffs attenuate imports of foreign goods on the one hand while they reduce domestic demand on the other hand. Note that, without trade, i.e., $\tilde{\boldsymbol{\xi}} = \boldsymbol{I}$, (A-37) collapses to

$$\boldsymbol{S}d\ln \boldsymbol{S}_t = \boldsymbol{V}'\boldsymbol{v}PCd\ln(P_tC_t). \tag{A-38}$$

In another simplified example, without production network, i.e., $\boldsymbol{\alpha} = \boldsymbol{\alpha}^f = \boldsymbol{I}$, we can show $\tilde{\boldsymbol{V}} = \boldsymbol{V} = \boldsymbol{I}$, $\tilde{\boldsymbol{v}} = \tilde{\boldsymbol{\xi}}\boldsymbol{v}$, $\tilde{\boldsymbol{v}}^f = (\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{v}^f$, $\boldsymbol{\eta} = \tilde{\boldsymbol{\xi}}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})(\boldsymbol{\theta}-\boldsymbol{I})\boldsymbol{D}$, $\boldsymbol{\eta}^f = \{\tilde{\boldsymbol{\xi}}^f(\boldsymbol{\theta}-\boldsymbol{I})+\boldsymbol{\theta}\}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f$, $\boldsymbol{D} = \boldsymbol{v}PC$, and $\boldsymbol{D}^f = \boldsymbol{v}^fP^fC^f$, implying that $\tilde{\boldsymbol{V}}$, $\boldsymbol{\eta}$, $\boldsymbol{\eta}^f$ are diagonal and thus there is no sectoral propagation.

Aggregate consumption. Sticking the market clearing conditions for non-tradable goods,

we obtain

$$\underbrace{v_N}_{\text{Non-tradable share}} \underbrace{PCd\ln(P_tC_t)}_{\text{Total expenditure}} = \underbrace{\left(\sum_{i\in N}(\boldsymbol{V}^{-1})_i\right)' \boldsymbol{S}d\ln\boldsymbol{S}_t}_{\text{Final expenditure on non-tradable goods}}, \tag{A-39}$$

$$v_N^f P^f C^f d\ln(P_t^f C_t^f) = \left(\sum_{i\in N}(\boldsymbol{V}^{f-1})_i\right)' \boldsymbol{S}_t^f d\ln\boldsymbol{S}_t^f, \tag{A-40}$$

where $v_N = \sum_{i\in N} v_i$ and $v_N^f = \sum_{i\in N} v_i^f$. $(\boldsymbol{V}^{-1})_i$ is the i-th column vector of $\boldsymbol{V}^{-1}$. The intuition is that, due to the log-utility function, a constant share of total expenditure goes to individual goods, which enables us to back out the total expenditure from individual goods production.

Production function. Production function together with FOCs determines the relation of sales with prices and factor inputs:

$$\boldsymbol{\alpha}d\ln\boldsymbol{S}_t = d\ln\boldsymbol{A}_t + \boldsymbol{\alpha}d\ln\boldsymbol{X}_t + \boldsymbol{V}^{-1}d\ln\boldsymbol{P}_t + (\boldsymbol{I}-\boldsymbol{\alpha})\boldsymbol{W}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})(d\ln\boldsymbol{P}_t - d\ln\boldsymbol{P}_t^f - d\ln\boldsymbol{\tau}_t), \tag{A-41}$$

$$\boldsymbol{\alpha}^f d\ln\boldsymbol{S}_t^f = d\ln\boldsymbol{A}_t^f + \boldsymbol{\alpha}^f d\ln\boldsymbol{X}_t^f + \boldsymbol{V}^{f-1}d\ln\boldsymbol{P}_t^f - (\boldsymbol{I}-\boldsymbol{\alpha}^f)\boldsymbol{W}^f(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)(d\ln\boldsymbol{P}_t + d\ln\boldsymbol{\tau}_t^f - d\ln\boldsymbol{P}_t^f), \tag{A-42}$$

Combining (A-41) and (A-42), we obtain

$$\begin{aligned} d\ln\boldsymbol{P}_t - d\ln\boldsymbol{P}_t^f = &\left\{\boldsymbol{I} + (\boldsymbol{V}-\boldsymbol{I})(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}) + (\boldsymbol{V}^f-\boldsymbol{I})(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\right\}^{-1} \\ &\Big\{\boldsymbol{V}(\boldsymbol{\alpha}d\ln\boldsymbol{S}_t - d\ln\boldsymbol{A}_t - \boldsymbol{\alpha}d\ln\boldsymbol{X}_t) - \boldsymbol{V}^f(\boldsymbol{\alpha}^f d\ln\boldsymbol{S}_t^f - d\ln\boldsymbol{A}_t^f - \boldsymbol{\alpha}^f d\ln\boldsymbol{X}_t^f) \\ &+(\boldsymbol{V}-\boldsymbol{I})(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})d\ln\boldsymbol{\tau}_t - (\boldsymbol{V}^f-\boldsymbol{I})(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)d\ln\boldsymbol{\tau}_t^f\Big\}, \end{aligned} \tag{A-43}$$

Closed-form solution. (A-31), (A-36), (A-39), (A-40), (A-43) solve for
$\{d\ln\boldsymbol{S}_t, d\ln\boldsymbol{S}_t^f, d\ln(P_tC_t), d\ln(P_t^fC_t^f), d\ln\boldsymbol{P}_t - d\ln\boldsymbol{P}_t^f\}$,
given $\{d\ln\boldsymbol{A}, d\ln\boldsymbol{A}^f, d\ln\boldsymbol{X}, d\ln\boldsymbol{X}^f, d\ln\boldsymbol{\tau}, d\ln\boldsymbol{\tau}^f\}$.

Substituting (A-36) into (A-43) eliminates $d\ln \boldsymbol{S}_t^f$:

$$d\ln \boldsymbol{P}_t - d\ln \boldsymbol{P}_t^f = \boldsymbol{c}_1^{-1}\Big\{\boldsymbol{c}_2\boldsymbol{S}d\ln \boldsymbol{S}_t - \boldsymbol{c}_3(\boldsymbol{v}PCd\ln P_tC_t + \boldsymbol{v}^f P^f C^f d\ln P_t^f C_t^f) \\ -\boldsymbol{V}(d\ln \boldsymbol{A}_t + \boldsymbol{\alpha}d\ln \boldsymbol{X}_t) + \boldsymbol{V}^f(d\ln \boldsymbol{A}_t^f + \boldsymbol{\alpha}^f d\ln \boldsymbol{X}_t^f) \\ +\boldsymbol{c}_4 d\ln \boldsymbol{\tau}_t - \boldsymbol{c}_5 d\ln \boldsymbol{\tau}_t^f\Big\}, \tag{A-44}$$

where $\boldsymbol{c}_1 = \boldsymbol{I} + (\boldsymbol{V}-\boldsymbol{I})(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}) + (\boldsymbol{V}^f-\boldsymbol{I})(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)$, $\boldsymbol{c}_2 = \boldsymbol{V}\boldsymbol{\alpha}\boldsymbol{S}^{-1} + \boldsymbol{V}^f\boldsymbol{\alpha}^f\boldsymbol{S}^{f-1}\boldsymbol{V}^{f'}\boldsymbol{V}'^{-1}$, $\boldsymbol{c}_3 = \boldsymbol{V}^f\boldsymbol{\alpha}^f\boldsymbol{S}^{f-1}\boldsymbol{V}^{f'}$, $\boldsymbol{c}_4 = \{\boldsymbol{V}^f\boldsymbol{\alpha}^f\boldsymbol{S}^{f-1}\boldsymbol{V}^{f'}\boldsymbol{D} + (\boldsymbol{V}-\boldsymbol{I})\}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})$, and $\boldsymbol{c}_5 = \{\boldsymbol{V}^f\boldsymbol{\alpha}^f\boldsymbol{S}^{f-1}\boldsymbol{V}^{f'}\boldsymbol{D}^f + (\boldsymbol{V}^f-\boldsymbol{I})\}(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)$. Combining (A-37) and (A-44) finally pins down the relation between $\boldsymbol{S}_t$ and exogenous variables as well as aggregate demand, eliminating relative price:

$$\boldsymbol{S}d\ln \boldsymbol{S}_t = \check{\boldsymbol{V}}'\Big[\check{\boldsymbol{v}}PCd\ln(P_tC_t) + \check{\boldsymbol{v}}^f P^f C^f d\ln(P_t^f C_t^f) \\ +\check{\boldsymbol{\theta}}\Big\{\boldsymbol{V}(d\ln \boldsymbol{A}_t + \boldsymbol{\alpha}d\ln \boldsymbol{X}_t) - \boldsymbol{V}^f(d\ln \boldsymbol{A}_t^f + \boldsymbol{\alpha}^f d\ln \boldsymbol{X}_t^f)\Big\} + \check{\boldsymbol{\eta}}d\ln \boldsymbol{\tau}_t - \check{\boldsymbol{\eta}}^f d\ln \boldsymbol{\tau}_t^f\Big], \tag{A-45}$$

where

$$\check{\boldsymbol{V}}' = \left\{\tilde{\boldsymbol{V}}'^{-1} + \underbrace{\tilde{\boldsymbol{\theta}}\boldsymbol{c}_1^{-1}\boldsymbol{c}_2}_{\text{Price effect}}\right\}^{-1},$$

and $\check{\boldsymbol{v}} = \tilde{\boldsymbol{v}} + \tilde{\boldsymbol{\theta}}\boldsymbol{c}_1^{-1}\boldsymbol{c}_3\boldsymbol{v}$, $\check{\boldsymbol{v}}^f = \tilde{\boldsymbol{v}}^f + \tilde{\boldsymbol{\theta}}\boldsymbol{c}_1^{-1}\boldsymbol{c}_3\boldsymbol{v}^f$, $\check{\boldsymbol{\theta}} = \tilde{\boldsymbol{\theta}}\boldsymbol{c}_1^{-1}$, $\check{\boldsymbol{\eta}} = \boldsymbol{\eta} - \tilde{\boldsymbol{\theta}}\boldsymbol{c}_1^{-1}\boldsymbol{c}_4$, $\check{\boldsymbol{\eta}}^f = \boldsymbol{\eta}^f + \tilde{\boldsymbol{\theta}}\boldsymbol{c}_1^{-1}\boldsymbol{c}_5$. Note that the propagation through $\check{\boldsymbol{V}}'$ is mitigated, compared to $\tilde{\boldsymbol{V}}'$, due to the price impact of output fluctuations. That is, higher sectoral output leads to higher domestic prices in (A-44), which carve out demand.

A.2 Equilibrium computation

Conditions (A-31), (A-32), (A-39), (A-40), (A-41), (A-42), and identities

$$d\ln \boldsymbol{S}_t = d\ln \boldsymbol{P}_t + d\ln \boldsymbol{Y}_t, \tag{A-46}$$

$$d\ln \boldsymbol{S}_t^f = d\ln \boldsymbol{P}_t^f + d\ln \boldsymbol{Y}_t^f, \tag{A-47}$$

provide 8 sets of linear equations to solve for 8 endogenous variables (vectors) $\{\boldsymbol{S}_t, \boldsymbol{S}_t^f, \boldsymbol{P}_t, \boldsymbol{P}_t^f, \boldsymbol{Y}_t, \boldsymbol{Y}_t^f, P_tC_t, P_t^fC_t^f\}$ given exogenous variables $\{\boldsymbol{A}_t, \boldsymbol{A}_t^f, \boldsymbol{X}_t, \boldsymbol{X}_t^f, \boldsymbol{\tau}_t, \boldsymbol{\tau}_t^f\}$. Other variables are calculated accordingly using respective conditions.

A.3 Consumption dynamics (18)

Iterating the budget constraint (5) forward, we obtain

$$\underbrace{\frac{W_t^{jh}}{P_{t-1}}}_{=\tilde{W}_t^{jh}} = \underbrace{\lim_{s\to\infty} \mathbb{E}_t \left[\frac{P_{t+s}/P_{t-1}}{R_{t,t+s}} \frac{W_{t+s+1}^{jh}}{P_{t+s}} \right]}_{=0} + \mathbb{E}_t \left[\sum_{s=0}^{\infty} \underbrace{\frac{P_{t+s}/P_{t-1}}{R_{t,t+s}}}_{=1/\tilde{R}_{t,t+s}} \left(C_{t+s}^{jh} - \frac{\alpha_j}{h_j} \frac{P_{jt+s} Y_{jt+s}}{P_{t+s}} \right) \right], \quad \text{(A-48)}$$

$$\text{where} \quad \tilde{R}_{t,t+s} = \prod_{u=0}^{s} \tilde{R}_{t+u}. \quad \text{(A-49)}$$

$\tilde{W}_t^j$ and $\tilde{R}_t$ denote real wealth and real rate of return, respectively. The first term is zero according to the transversality condition. By iterating the Euler equation (A-1) forward, while abstracting the Jensen's inequality term, we obtain

$$\mathbb{E}_t \left[C_{t+s}^{jh} \right] = \mathbb{E}_t \left[C_t^{jh} \left(\beta^s \tilde{R}_{t,t+s} \right)^{\frac{1}{\gamma}} \right], \quad \text{(A-50)}$$

Substituting (A-50) into (A-48) yields

$$C_t^{jh} = \mathbb{E}_t \left[\underbrace{\Gamma_t}_{\text{multiplier}} \left(\underbrace{\tilde{R}_t \tilde{W}_t^{jh}}_{\text{financial income}} + \underbrace{\frac{\alpha_j}{h_j} \sum_{s=0}^{\infty} \frac{\tilde{R}_t}{\tilde{R}_{t,t+s}} \frac{S_{jt+s}}{P_{t+s}}}_{\text{PV of future labor income}} \right) \right], \quad \text{(A-51)}$$

$$\text{where} \quad \Gamma_t = \left(\sum_{s=0}^{\infty} \beta^{\frac{s}{\gamma}} \left(\frac{\tilde{R}_{t,t+s}}{\tilde{R}_t} \right)^{\frac{1}{\gamma}-1} \right)^{-1}. \quad \text{(A-52)}$$

In the first order approximation, we obtain

$$\underbrace{d \ln C_t^{jh}}_{\text{Individual consumption}} = \underbrace{\omega^{jh} d \ln R_t}_{\text{Financial income}} + \underbrace{(1-\omega^{jh})(1-\beta) \sum_{s=0}^{\infty} \beta^s \mathbb{E}_t \left[d \ln S_{jt+s} \right]}_{\text{Labor income}}$$
$$+ \underbrace{\left(\omega^{jh} - \frac{1}{\gamma} \right) (1-\beta) \sum_{s=1}^{\infty} \beta^s \mathbb{E}_t \left[\sum_{u=1}^{s} d \ln R_{t+u} \right]}_{\text{Changes in future asset returns}}, \quad \text{(A-53)}$$

Using the random-walk assumption and the linear structure of the model, we obtain (18) in the main text.

A.4 National accounting

Home country's nominal GDP is given by

$$GDP_t = P_t C_t + \underbrace{\sum_{i=1}^{n}(1-\xi_i^f)^{\theta_i}(\tau_{it}^f)^{-\theta_i}\left(\frac{P_{it}}{\lambda_{it}^f}\right)^{-\theta_i+1} D_{it}^f}_{=EX_t:\text{Exports}} - \underbrace{\sum_{i=1}^{n}(1-\xi_i)^{\theta_i}\tau_{it}^{-\theta_i}\left(\frac{P_{it}^f}{\lambda_{it}}\right)^{-\theta_i+1} D_{it}}_{=IM_t:\text{Imports}}. \tag{A-54}$$

In the first order,

$$\begin{aligned} dGDP_t &= d(P_tC_t) + \sum_{i=1}^{n}(1-\tilde{\xi}_i^f)\left\{-\theta_i D_i^f d\ln\tau_{it}^f - (\theta_i-1)D_i^f(d\ln P_{it} - d\ln\lambda_{it}^f) + dD_{it}^f\right\} \\ &\quad - \sum_{i=1}^{n}(1-\tilde{\xi}_i)\left\{-\theta_i D_i d\ln\tau_{it} - (\theta_i-1)D_i(d\ln P_{it}^f - d\ln\lambda_{it}) + dD_{it}\right\} \\ &= d(P_tC_t) + \mathbf{1}'(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)d\boldsymbol{D}_t^f - \mathbf{1}'(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})d\boldsymbol{D}_t - \tilde{\boldsymbol{\theta}}(d\ln\boldsymbol{P}_t - d\ln\boldsymbol{P}_t^f) \\ &\quad + \mathbf{1}'(\boldsymbol{I}+(\boldsymbol{\theta}-\boldsymbol{I})\tilde{\boldsymbol{\xi}})(\boldsymbol{I}-\tilde{\boldsymbol{\xi}})\boldsymbol{D}d\ln\boldsymbol{\tau}_t - \mathbf{1}'(\boldsymbol{I}+(\boldsymbol{\theta}-\boldsymbol{I})\tilde{\boldsymbol{\xi}}^f)(\boldsymbol{I}-\tilde{\boldsymbol{\xi}}^f)\boldsymbol{D}^f d\ln\boldsymbol{\tau}_t^f. \end{aligned} \tag{A-55}$$

The income approach yields

$$GDP_t = \sum_{i=1}^{n} E_{it}X_{it} = \sum_{i=1}^{n}\alpha_i S_{it}, \tag{A-56}$$

and

$$dGDP_t = \mathbf{1}'\boldsymbol{\alpha}d\boldsymbol{S}_t. \tag{A-57}$$

Using the symmetry of home and foreign economies, (A-55) and (A-57) imply

$$\mathbf{1}'\boldsymbol{\alpha}d\boldsymbol{S}_t + \mathbf{1}'\boldsymbol{\alpha}^f d\boldsymbol{S}_t^f = d(P_tC_t) + d(P_t^fC_t^f). \tag{A-58}$$

B Political Outcomes

B.1 Related literature

Theory. A seminal work by Mayer (1984) examines tariff determination through electoral competition in a Heckscher-Ohlin economy with 2 goods (one export good and one import good) and 2 production factors (capital and labor). Political parties commit to the most preferred tariff of the median voter, while voters differ in their capital ownership. The model results in a positive tariff in a high-income country if the median voter holds less-than-average capital and thus wants to avoid imports of labor-intensive goods from a lower-income country. Other papers extend the median voter result for the case of noise to voters' preferences, limited information on parties' agenda, etc. (Lindbeck and Weibull, 1993; Ponzetto, 2011; see a survey by McLaren, 2016).

Magee-Brock-Young (MBY; Magee et al., 1989; Brock and Magee, 1978; Young and Magee, 1986) propose a 2×2 Heckscher-Ohlin economy in which lobbies make campaign contributions to increase the probability that their favored political party wins. In their model, the endowment of each factor is positively associated with campaign contributions through which political parties are incentivized to set import tariffs or export subsidies.

Another line of literature studies lobbying with an incumbent government. A few studies propose informational lobbying where a lobbyist knows the state of the world whereas a politician does not, and a lobbyist has to undertake costly signaling to avoid cheap talk (Austen-Smith, 1993; Grossman and Helpman, 2002). Many other studies argue for the role of influence peddling, positing that interest groups (e.g., industries) influence the policy stance of an incumbent party through lobbying. Grossman and Helpman (1994) consider that a politician's payoff includes the benefits of receiving contributions from lobbies and social welfare. They show that, in an equilibrium, trade policies are determined to maximize the joint profit of social welfare and lobbies. Goldberg and Maggi (1999) propose a simple Nash bargaining game between the government and lobbies, which derives the same prediction as Grossman and Helpman (1994)'s model. The model implies a cross-sectional relationship between sectoral tariffs and sectoral characteristics, including import penetration, import elasticity, and lobby formation.

Empirics. Dutt and Mitra (2002) takes the Mayer (1984) model to cross-country data, supporting the model's prediction that import tariffs are positively correlated with countries'

income levels.

Goldberg and Maggi (1999) and Gawande and Bandyopadhyay (2000) test Grossman and Helpman (1994)'s model prediction by employing non-tariff barriers and the lobby formation in the Political Action Committees (PAC). Ederington and Minier (2008) question the construction of lobbies since lobbies may be formed for non-trade purposes. Matschke (2008) points out that the use of non-tariff barriers is inappropriate as they essentially do not raise tariff revenues, which are critical elements of the model. Instead, he uses tariff data, arguing that, though tariffs require multinational negotiations, these tend to preserve a cross-sectional structure (e.g., GATT negotiations were targeted to uniformly reduce tariffs by a certain percentage, and thus, the cross-sectional differences in pre-negotiation tariffs remained mostly unchanged).

Autor et al. (2020) find that the exposure to imports from China led to political polarization, i.e., higher GOP support in counties with the majority of the white population and higher Democratic support in those with a minority of the white population, before the 2016 US election.

In what follows, we consider three political competitions: median voter, lobbying for political campaigns, and sectoral lobbying in an incumbent government.

B.2 Campaign contributions

We consider a MBY-type lobbying for campaign contributions. Suppose there are two parties: one supporting globalization G and the other supporting autarky (fragmentation) A. Let p_t^G be the probability of the party G to win. p_t^G is a function of contributions from each campaign, X_t^G and X_t^A, and the share of households that benefit from globalization θ_t^G. Note that MBY do not take into account θ_t^G in their model. We assume a functional form

$$p_t^G = c\left(\frac{X_t^G}{X_t^A}\right)^{\alpha}(\theta_t^G)^{1-\alpha}, \tag{A-59}$$

where $c = (1/2)^{\alpha}$ is a constant to normalize $p^G = 1/2$ when $X_t^G = X_t^A$ and $\theta_t^G = 1/2$.

Households supporting each party make campaign contributions. They make a collective decision to contribute x percent of own wealth at the beginning of the period. The total contribution in each campaign is given by $X_t^K = x_t^K \int_{j\in K} W^j dj$ for $K = \{G, A\}$. It maximizes

the expected gain:

$$\max_{x_t^K}: \; p_t^G \int_{j\in K} W^j \left(\frac{dC_t^j}{C^j} - x_t^K \right) dj + (1-p_t^G) \left(- \int_{j\in K} W^j x_t^K dj \right). \tag{A-60}$$

The FOC is given by

$$\underbrace{\frac{\partial p_t^G}{\partial X_t^K} \int_{j\in K} W_j \frac{dC_t^j}{C^j} dj}_{\text{expected benefit of contribution}} = \underbrace{1}_{\text{cost of contribution}}, \tag{A-61}$$

for $K = \{G, A\}$. We assume $\partial \theta_t^G / \partial X_t^G = 0$. Using (A-59), we can show

$$p_t^G = c \left(\frac{\int_{j\in G} W^j \frac{dC_t^j}{C^j} dj}{-\int_{j\in A} W^j \frac{dC_t^j}{C^j} dj} \right)^{\alpha} (\theta_t^G)^{1-\alpha}, \tag{A-62}$$

and

$$\frac{X_t^G}{X_t^A} = \frac{\int_{j\in G} W^j \frac{dC_t^j}{C^j} dj}{-\int_{j\in A} W^j \frac{dC_t^j}{C^j} dj}, \tag{A-63}$$

The winning probability p_t^G in (A-62) depends on the magnitude of the gain or loss from globalization, which is reflected in campaign contributions, as well as the share of intrinsic supporters θ_t^G. Note that the gain or loss is weighted by households' wealth as wealthy households make more contributions. For party G, if the gain from globalization diminishes, for example due to slowdown of the foreign economy's growth (R_t change) or decline in the initial wealth (W^j), X_t^G and p_t^G would decrease as well. Further, (A-63) indicates that the relative amounts of campaign contributions between two parties are increasing in the gross gains and losses from globalization. This provides a prediction that could be examined to the data.

C Supplementary Figures

Figure A-1: Inequality measures implied by the model

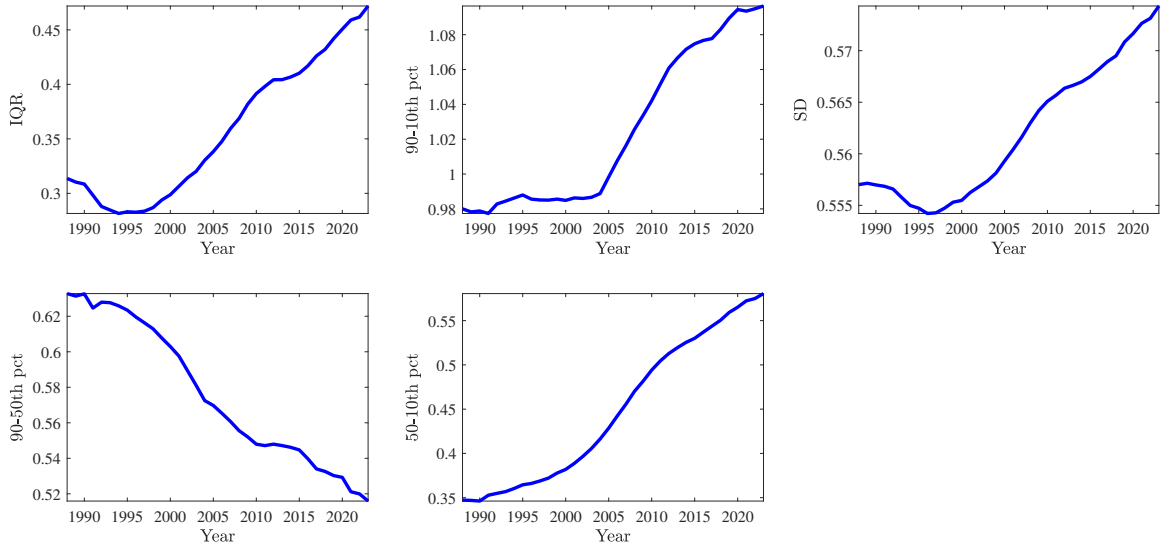


Figure A-2: Consumption impact of globalization by sector implied by the model

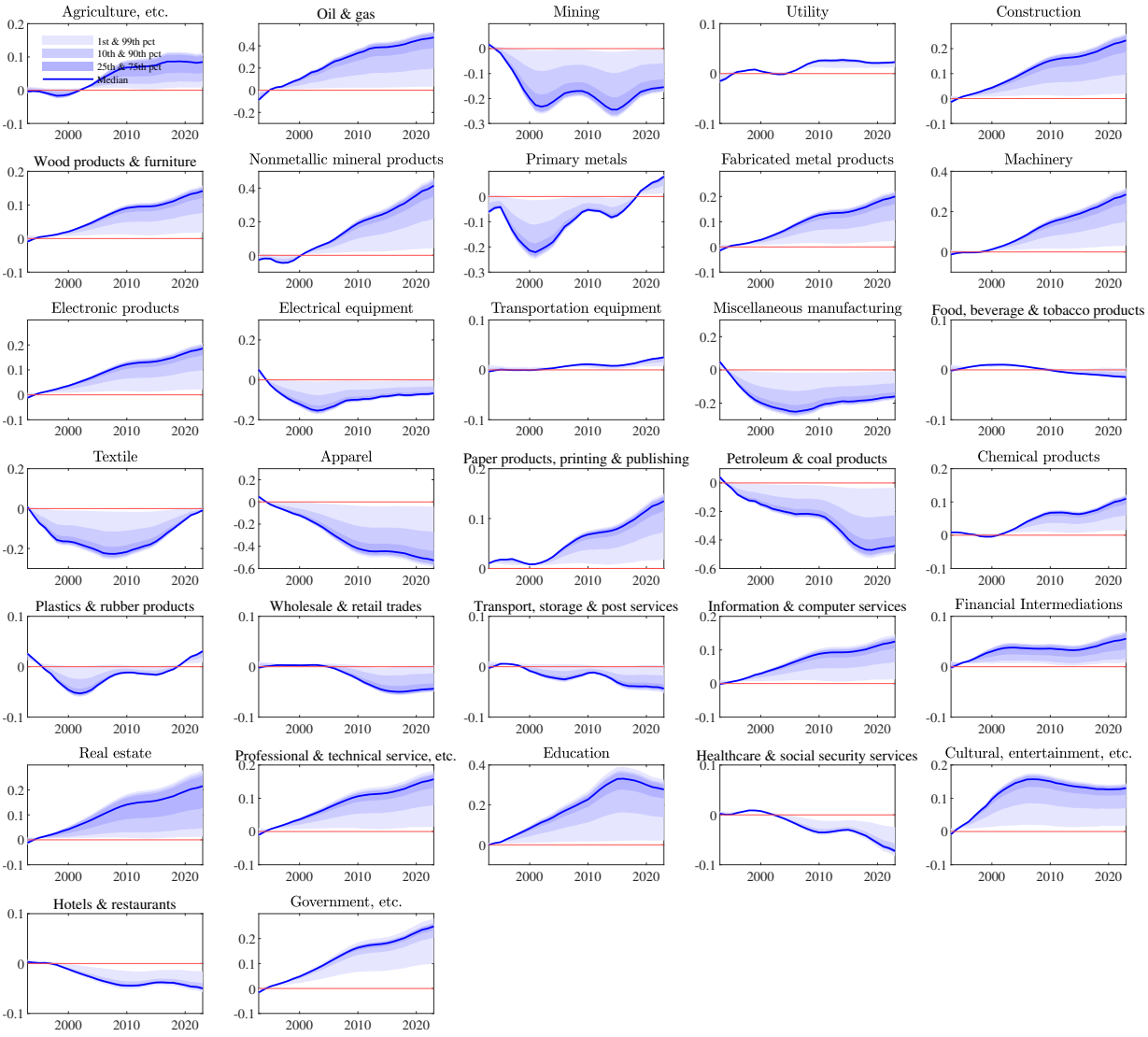


Figure A-3: Tariff rates

