The China Shock in Emerging Economies: Unbundling the Electoral Consequences of Trade Exposure in Brazil*

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How does the changing composition of trade with China affect electoral outcomes in emerging economies? While the political consequences of the "China shock" have been widely studied in advanced economies—often emphasizing electoral backlash and support for populist or far-right parties—emerging markets have experienced rapid integration with China through both import competition and export expansion. We argue that understanding the political effects of these shocks requires a full accounting of distributional impacts along domestic supply chains, while also recognizing that trade exposure may simultaneously activate competing political responses. We examine Brazilian presidential elections between 2002 and 2022, focusing on support for the Workers' Party (PT). We construct measures of local labor market exposure to trade with China that capture both direct exposure and indirect exposure through inter-industry linkages. Our results show that trade shocks are politically consequential, but in ways that differ from patterns documented in advanced economies. Areas more exposed to import competition did not shift toward right-wing challengers, while areas benefiting from export growth exhibited declining support for the PT. Our initial findings related to indirect exposure also show nuanced effects, but those that generally are consistent with an economic voting story. More generally, we caution that reduced-form trade exposure coefficients in meso-level analysis should be interpreted

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as aggregations of offsetting political effects. Taken together, our findings underscore both the value and the limits of extending China-shock frameworks beyond advanced economies and highlight the need for caution in interpreting estimated trade effects as evidence of uniform political responses.

1 Introduction

The rise of China as the world's manufacturing powerhouse has reshaped politics across the globe. A rich literature focused on the advanced economies has examined the economic and political effects (e.g. Autor, Dorn, and Hanson 2016; Colantone and Stanig 2018a). Yet, developing and emerging markets have also been profoundly impacted. Some emerging markets have faced export competition in third-country markets, while others like Brazil have experienced both growth in manufacturing imports—like the advanced economies—and also a simultaneous shift in primary sector exports to China (Costa, Garred, and Pessoa 2016). These dynamics have transformed trade, impacted labor markets, and led to lower wage inequality (Chagas and Sant'Anna 2024). These distinct trade patterns complicate how we should interpret the political consequences of the China shock outside advanced economies.

In this paper, we examine the political economy of the "China shock" in emerging markets, with a focus on Brazil. A growing literature analyzes the mass politics of trade in emerging economies, from the effects of trade liberalization in the 1990s to more recent exposure to Chinese import and export shocks. This work shows that trade integration shapes political outcomes, including voter preferences (Cavalcante, Moreno-Louzada, and Menezes Filho 2023; Iacoella, Justino, and Martorano 2020; Rettl 2025) and legislators' positions on international trade (Campello and Urdinez 2021). However, exactly how and why trade exposure translates into political outcomes remains unclear. Existing studies of Brazil point to countervailing mechanisms and yield mixed empirical findings.

This ambiguity reflects the challenges of extending existing frameworks to emerging economies characterized by fragmented production and multiple, overlapping trade shocks. Analytically, studies often model the distributional consequences of trade exposure in isolation-—focusing on either imports or exports-—without accounting for the dual nature of the shocks, as well as how trade shocks are transmitted through global production networks. Empirically, existing research examines different outcomes and time horizons, making it difficult to assess whether estimated effects reflect common underlying mechanisms or context-specific dynamics. Together, these features complicate the interpretation of trade exposure coefficients and their political implications.

In this paper, we argue that understanding the political economy effects of regional trade shocks

requires accounting for both the nature of the shock—whether it generates economic losses or gains—and the multiple, potentially competing political responses such shocks can activate. We therefore model both negative and positive trade shocks and examine how they are transmitted through global production networks. Drawing on the global production literature, we theorize and measure indirect exposure to trade through supply chain linkages and the associated welfare consequences, building on work in the U.S. context Acemoglu et al. (2016), Betz and Hummel (2025), Betz and Sun (2022), Jensen, Quinn, and Weymouth (2017), Liu and Quinn (2025), and Pierce, Schott, and Tello-Trillo (2024). We emphasize that trade shocks can influence political outcomes through more than one channel. In particular, they may shape party preferences by altering demands for compensation, while also affecting electoral support for incumbents through economic voting. Existing studies of the electoral consequences of globalization in developing countries-—especially in Brazil—-have largely emphasized party preferences and demands for compensation through redistributive transfers. We incorporate these perspectives and discuss how positive and negative shocks may generate offsetting political responses, implying that estimated effects reflect net outcomes rather than a single underlying mechanism.

Empirically, we examine how regional exposure to trade up and down the supply chain affects support for PT in presidential elections between 2002 and 2022, measured for Brazilian microregions (comparable to U.S. commuting zones). We calculate both direct and indirect measures of trade exposure using a shift-share instrument. Using an estimation approach common in the China shock literature, we estimate changes in our outcome relative to the base year of 2002, thus capturing the long-term or persistent effects. We first demonstrate that direct and indirect shocks are related to variation in local labor market outcomes. We then examine changes in support for PT for each election between 2010 and 2022 relative to 2002.[1] As we discuss further below, PT is the incumbent party during a majority of the period. Moreover, it is the main organizing pole of Brazilian politics (e.g. Samuels, Mello, and Zucco 2024; Samuels and Zucco 2018a). We find that import and export shocks have different—and sometimes offsetting—political effects. Import exposure tends to be positively associated with support for the left, but these estimates are often not

[1]We exclude 2006 in the main analysis in order to allow the shock time to impact economic outcomes.

statistically precise, consistent with the idea that import shocks combine electoral punishment of incumbents with increased demand for compensation. Export exposure, by contrast, is associated with significant declines in left-party support, suggesting reduced redistributive demand in regions benefiting from trade gains. When we account for supply-chain position, the indirect shocks also display patterns consistent with economic voting, highlighting the importance of production linkages for interpreting net effects. Notably, despite a series of economic and political crises during the 20 years of our study, we find similar (though not identical) effects across elections.

This paper makes several contributions. First, in contrast to other work on the political economy of the China shock in Brazil, we look at data over a longer period of time. This allows us to potentially shed light on some of the mixed findings in the literature and explore whether patterns are shifting or consistent over time. Second, we consider the double integration shock, looking at both imports and exports. This is important because these forces have reshaped trade in Brazil in fundamental ways. Moreover, there is substantial variation in exposure across regions to these various shocks. Third, we argue that to understand the impact of the China shock, we must consider how it is transmitted through global production. Specifically, we account for exposure to upstream and downstream effects. These separate concepts can be combined into a theoretical framework on the effects of globalization on political outcomes that can be used to understand (conflicting) empirical findings.

2 Literature

In this section, we review key literatures in both advanced and developing countries. We highlight the importance of studying the political economy of China in emerging markets and consider key ways in which it is distinct from that in advanced economies.

A large literature has focused on the impact of the China import shock on political and economic outcomes in advanced economies. Consistent with a factor endowments model, low-skill workers are expected to be negatively affected by imports from a labor-abundant country. Import competition from China has led to more authoritarian values (Ballard-Rosa, Jensen, and Scheve 2022), more support for protectionist policies (Colantone and Stanig 2018c; Feigenbaum and Hall

2015), increased support for protectionist parties (Che et al. 2022; Colantone and Stanig 2018b,c) and increased political polarization (Autor et al. 2020). Going beyond the China shock, Baccini and Weymouth (2021) find that the electoral response for job losses in manufacturing in the US varies with racial identity (voters penalize incumbent Democrats more for white worker layoffs than non-white worker layoffs). Evidence of anti-incumbent effects in response to shocks is largely focused on the US. For instance, Margalit (2011) shows that job losses from import competition reduced support for the incumbent in 2004 and 2008. These studies convincingly demonstrate that trade exposure in manufacturing shapes electoral (and other political) outcomes in advanced economies in important ways.

Echoing the discussion of the role of import competition in advanced economies, research in developing countries also shows that trade liberalization created import competition for manufacturers. Several scholars have examined the impacts of various trade shocks—including trade liberalization generally, and the China shock specifically—on macroeconomic outcomes in Latin America (for a review, see Goldberg and Pavcnik (2007)). Notably, this body of work has largely focused on studying the impact of import competition shocks on labor market outcomes. A recent review finds that trade liberalization led to labor disruptions and growing wage inequality in Latin America, particularly affecting informal and low-wage workers (Dix-Carneiro and Kovak 2023). In a series of articles focusing on Brazil, Dix-Carneiro and co-authors show that the 1990-95 tariff cuts in Brazil shaped labour market outcomes, in terms of employment (Dix-Carneiro and Kovak 2017), wages (Dix-Carneiro and Kovak 2019; Kovak 2013), and formal and informal transitions between jobs (Dix-Carneiro, Soares, and Ulyssea 2018). Using variation in industry-specific tariff cuts interacted with initial regional industry composition to measure trade-induced local shocks to labor demand, they find that workers in regions that faced larger tariff declines experience worse formal labor market outcomes compared to workers in other regions.

In comparison to the literature on the political economy of trade in the advanced economies, the political economy of trade in the Global South has received less attention. In contrast to the advanced economies, there is little consensus about the distributional effects of trade for workers. Canonical political economy models of trade anticipate that, in contrast to workers in advanced economies, low-skilled workers in labor-abundant economies should benefit from trade liberalization with advanced economies because their country specializes in the production of unskilled

labor-intensive products. But the evidence to support this has been mixed (Baker 2005; Beaulieu, Yatawara, and Wang 2005; Dolan and Milner 2023; Jamal and Milner 2005; Mayda and Rodrik 2005). Alternatively, Rudra (2008) emphasizes that the least skilled workers (no-eds) do not benefit from trade liberalization in terms of job opportunities, while Menéndez González, Owen, and Walter (2023) argue that it is the relatively skilled workers that benefit from manufacturing export opportunities. Work by Aksoy, Guriev, and Treisman (2024) finds that workers across countries (primarily advanced and middle income, given their sample) disklike imports intensive in their skill and like imports intensive in the other skill. They reward or punish governments accordingly. See also Rudra, Nooruddin, and Bonifai (2021) for a review of the literature and suggestions for further research on the globalization backlash.

Although much of the backlash literature (particularly in the advanced economies) has focused on losers, the winners from trade are also an important political factor. Recent research in the advanced economies emphasizes that the gains from trade with China are economically significant (Feenstra, Ma, and Xu 2019; Pierce, Schott, and Tello-Trillo 2024). Indeed, Jensen, Quinn, and Weymouth (2017) show that high-wage tradable service employment, which gains from trade, increases incumbent vote shares, while low-wage tradable manufacturing employment decreases them. Moreover, Liu and Quinn (2025) show that the economic political impacts of the China import shock are actually driven by the offshoring and trading behavior of multinational companies.

It is especially important to consider the effects of rising export demand on labor market outcomes, particularly in response to the China shock, in emerging markets. China is an increasingly large consumer of goods produced abroad. Spurred by the rising share of agricultural and extractive sectors in the exports of developing countries to China, essentially a commodities-for manufacturing trade relationship, Costa, Garred, and Pessoa (2016) find that while local labor markets hit by Chinese import competition fare worse in terms of growth of manufacturing wages between 2000 and 2010, winning regions saw faster wage growth in response to rising commodity demand from China. Further, Chagas and Sant'Anna (2024) find that exposure to trade though global supply chain linkages reduced wage inequality in Brazil, as industries and firms with relatively higher wages were harmed by import competition (and upstream exports), while firms and industries with relatively lower wages benefited from exports and upstream imports.

What does this all mean for the political economy of the China shock in the Global South?

Evidence of the political effects of the China shock remains limited, and extant studies offer different mechanisms. Work on the mass politics of globalization in developing countries (focused on Brazil) draws on two theoretical approaches that describe how economic shocks may shape political behavior. A first approach works through the effects of shocks on policy preferences and voting across a left-right dimension. Arguments in this tradition posit that negative (positive) shocks induce leftward (rightward) shifts in policy preferences and, through this mechanism, increase (decrease) support for parties that advocate redistribution (see Margalit (2019) for a review). In line with work on the electoral effects of negative income shocks in more advanced economies, Iacoella, Justino, and Martorano (2020) find that regions affected by tariff cuts in 1990-95 saw increases in support for left-wing Lula in 2002 *and* for right-wing Bolsonaro in 2018. They attribute this to the effects of austerity that preceded both elections, which magnified the distributive effects of trade and allowed both candidates to channel social discontent.[2]

Shifting to consider exports, Rettl (2025), who focuses on the period from 2010 to 2018, argues that the decline in exports that takes place during this period – a negative economic shock – leads to lower support for PT in 2014 and 2018 because citizens who are negatively impacted turn to evangelical churches rather than the state for compensation, both in the aggregate and at the individual level. In contrast, Cavalcante, Moreno-Louzada, and Menezes Filho (2023) look at the results of proportional representation elections for the national lower house and municipal chambers between 2000 and 2010. They find that positive export demand shocks from China produce rightward shifts in ideology. The mechanism in support of a rightward shift is a decline in demand for redistributive policies (such as Bolsa Familia in Brazil). Using aggregate measures of import exposure, they find no effect of imports.[3] See also, Helms (2024), Scheve and Serlin (2024), and Serlin (2022) who find that export booms can actually generate a backlash to globalization in certain contexts.

[2]In the case of the advanced economies, see for instance Baccini and Sattler (2025)

[3]Cavalcante, Moreno-Louzada, and Menezes Filho (2023) acknowledge that import competition, which is shown to increase wages and decrease unemployment, can also have positive effects because "in developing countries imports from China allowed firms to source better inputs, which increased productivity" (Cavalcante, Moreno-Louzada, and Menezes Filho 2023, 30). However, they do not directly test this.

An alternative mechanism anticipates that voters punish (reward) the incumbent for negative (positive) economic performance during their time in office, regardless of their ideological position (see Healy and Malhotra (2013) for a review). Extending the focus to a broad sample of developed and developing economies, Aksoy, Guriev, and Treisman (2024) propose that the impact of trade on political approval depends on the skill composition of the labor force, with skilled workers benefiting from high-skill trade while unskilled workers suffer from low-skill competition. They find that growth in high-skill exports increases political approval among skilled individuals, while high-skill imports lower approval, showing polarization effects based on skill levels. See also Campello and Zucco Jr (2016), who find that in Brazil (as well as other Latin American countries reliant on commodity exports, voters reward incumbents for economic outcomes that are driven by international market forces like the U.S. interest rate and commodity prices. There are no direct tests to our knowledge of an economic voting model of the China shock in Brazil.

In Table 1, we present a summary of work that is specific to the political economy of the China shock with respect to mass politics. A few notes are important to point out. Different studies are focused on different mechanisms (e.g. economic voting and approval vs. policy/party preferences). Second, there are different outcomes, including support for populism, votes in lower level elections, and support for PT. Third, the studies use different model specifications. Some include both import and exports, while others focus on imports or exports. Finally, these studies cover very different time periods. This is important because of significant changes in Brazilian politics and economics from 2000 forward. As we discuss further below, the early 2000s were characterized by the rise of PT. The 2010s brought major economic and political challenges, including the impeachment of President Rousseff and the loss of trust in PT due to corruption. Thus, it is hard to know what conclusions to draw from these mixed findings. If we ignore imports, we miss competition for workers in regions that may differ from those engaged in growing exports. Conversely, looking only at exports causes us to miss both costs and benefits of trade related to imports.

Like Aksoy, Guriev, and Treisman (2024), we emphasize the importance of disaggregating trade flows. We explicitly incorporate the role of imports and exports at different stages of production to better understand how distributional effects impact political outcomes. We draw on literature that emphasizes the importance of production networks and supply chains. In the U.S. context, Betz and Hummel (2025) find that trade protection is more likely to be granted to firms

Table 1: Trade and Political Attitudes/Electoral Outcomes in Brazil

Study	**Period**	**Main finding**
Cavalcante et al. (2023)	2000–2010	Exports → less support for PT in PR elections; no effect of imports.
Rettl (2025)	2010–2018	Decline in exports reduced PT presidential support; imports not included.
Iacoella et al. (2020)	2002 & 2018	Tariff liberalization ↑ support for populist presidential candidates.

Notes: PT = Workers' Party. PR = proportional representation. Arrows indicate direction of effect.

that have more extensive domestic supply chains, because the protection indirectly benefits suppliers in the network. Liu and Quinn (2025) find that the negative economic and political effects of the China shock are driven by the economic activity of multinational firms, rather than direct competition from solely domestic Chinese producers. Further, they show that employment supported by exports to China leads to an increase in support for incumbents. Notably, they argue that this is about economic voting and support for the incumbent, not about partisanship.

3 Trade, supply chains, and competing political responses

In this section, we develop a framework for understanding how trade shocks affect political outcomes in emerging economies characterized by fragmented production and multiple, overlapping sources of exposure. Our central claim is that the political consequences of trade shocks depend both on the nature of the shock—whether it generates economic losses or gains—and on the multiple political responses such shocks can activate. Because these responses may operate simultaneously and in opposing directions, estimated effects should be interpreted as net outcomes rather than as evidence of a single underlying mechanism.

To understand whether and how material interests influence politics in an era of globalization, it is important to develop an accurate theory of distributional consequences. These fall into two broad categories. First, trade generates both winners and losers. Second, in a world of fragmented production, supply chain linkages create indirect channels of exposure that may amplify or offset the direct effects of trade. Building on works cited above, such as Betz and Sun (2022) and Jensen, Quinn, and Weymouth (2017), we outline the anticipated effects of trade for distinct groups of

winners and losers. This is especially important in emerging markets, which have often experienced a double-sided trade shock with China: increased imports of manufactured goods alongside commodity export booms.

The standard approach in the literature is to theorize about the direct effects of imports (and sometimes exports) on workers and their communities (e.g. Autor, Dorn, and Hanson 2013). In a simple world with labor and capital and some immobility across industries, workers in import-competing industries face lower wages and employment, while those in exporting industries benefit. Communities with greater employment in exposed industries will thus be more negatively (positively) affected by import (export) exposure. We follow the literature in referring to these as "**direct**" effects.

However, this framework overlooks substantial exposure that occurs indirectly through global supply chains. Consider the supply chain of a widget requiring several intermediate inputs. The widget producer benefits from cheaper imported inputs, even as the input producer faces direct import competition. Conversely, the widget producer is worse off if those inputs are exported, as higher costs reduce margins, while the input producer benefits. We refer to these purchaser-facing effects as "**downstream**" effects. From the perspective of the input producer, exports of the final product increase demand for their inputs, while imports of the final product reduce it. We refer to these supplier-facing effects as "**upstream**" effects. Workers are therefore indirectly affected by positive or negative shocks transmitted through these channels. Using formal sector data from Brazil, Chagas and Sant'Anna (2024) show that wages at both the industry and firm level are shaped by such indirect import and export exposure. These inter-industry trade links can magnify the overall economic effects of trade (Acemoglu et al. 2016, 145).[4]

In addition, trade shocks spill over to the broader local economy through changes in labor demand and reallocation effects (Acemoglu et al. 2016). For instance, Pierce, Schott, and Tello-Trillo (2024) show that county-level exposure to trade influences workers' well-being, including those not directly employed in trade-exposed sectors. Non-manufacturing workers, for example, can benefit from imports of intermediate goods and be harmed by imports of downstream products

[4]A related though not overlapping aspect is related-party imports, which benefit those firms and their employees. We are not able to capture that with our data, but see Liu and Quinn (2025) and Owen and Quinn (2016) for examples of the political effects of this type of trade in the U.S.

in their county. Wang et al. (2019) find that upstream exposure reduces local employment, while downstream imports raise it. Our argument, consistent with other research on the economic geography of trade, is that trade shocks produce real, material effects on local labor market outcomes in commuting zones. Consumers are also affected, but these benefits are diffuse and not strongly tied to local variation in trade exposure (e.g. Betz and Pond 2019; Betz and Sun 2022).

As evidence of our mechanism, we document empirically that positive trade exposure is linked to better labor market outcomes, while negative trade exposure is linked to worse ones. We summarize the anticipated welfare consequences of each type of exposure in Table 2.

Table 2: Summary of expected material effects

Exposure	**Rationale**
Imports	Competition reduces demand for labor
Upstream Import	Producers upstream hurt by import competition for buyers
Downstream Imports	Buyers downstream benefit from cheaper inputs
Exports	Increased demand for labor
Upstream Exports	Producers upstream benefit from more demand for goods
Downstream Exports	Buyers downstream hurt by exports of inputs

Note: Exposure refers to the position of the affected industry.

How might trade shocks shape political outcomes? Existing research suggests several pathways, including economic voting, shifts in policy preferences, and the activation of cultural or status-based grievances. While no single mechanism fully captures the complexity of voter responses, these literatures provide useful starting points. We remain agnostic about what the net effect will be in our context and instead emphasize how each may operate.

A first set of arguments comes from the economic voting literature, which holds that voters reward or punish incumbents based on economic performance. Traditional work emphasized macroeconomic indicators such as inflation and unemployment, but more recent studies argue that voters respond to the material conditions in their local labor markets. This logic applies directly to trade shocks: communities that gain economically from integration are expected to increase support for incumbents, while communities that lose are expected to reduce support. Importantly, such responses are consistent with both self-interested and sociotropic motivations. Individuals may react to changes in their own employment or wages, but they may also update evaluations based on the welfare of their broader community (Ansolabehere, Meredith, and Snowberg 2014;

Bisbee 2025; Frieden 2022; Scheve and Slaughter 2001).

A second line of argument emphasizes partisan preferences and policy demands. Negative shocks can increase support for redistribution or protection, leading voters to favor parties that advocate such policies.[5] Classic accounts of embedded liberalism argue that governments sustained globalization by compensating those harmed through redistributive policies (Hibbs 1977; Ruggie 1982). Left parties often championed this compromise, though they also sometimes promoted more protectionist alternatives. More recent scholarship raises questions about the erosion of this arrangement in advanced economies (e.g. Ballard-Rosa et al. 2021; Hays 2017) and highlights its limited feasibility in emerging markets, where tariff revenue has declined and fiscal capacity is constrained (Bastiaens and Rudra 2019). In such contexts, the partisan consequences of trade may depend on whether redistribution is viewed as credible and salient (e.g. Holland 2018). Given that our empirical case is Brazil, we focus on demands for redistribution as a more salient policy than potential trade protection.[6] Thus, those exposed to negative (positive) trade shocks are likely to demand more (less) compensation and support parties accordingly.

A third body of work highlights cultural or status-based mechanisms, particularly in advanced economies.[7] In Brazil, Samuels, Mello, and Zucco (2024) show that lower-skilled workers, women, and racial minorities who benefited from economic growth were more likely to support the PT,

[5]Voter preferences in response to economic shocks may differ based on the source and nature of the shocks. For instance, see in the U.S., Chaudoin and Mangini (2024).

[6]One aspect of Brazil's economic engagement with China that did begin to receive negative attention was Chinese investment in resources and critical infrastructure, including from Bolsanaro in the 2018 campaign. See Moehlecke, N Fasolin, and Spektor (2025) and Urdinez (2023).

[7]Trade shocks can activate grievances tied to immigration, national identity, or perceived status loss, which are often mobilized by populist or outsider parties (Baccini and Weymouth 2021; Colantone and Stanig 2018c; Hibbs 2016; Hobolt and Tilley 2016; Iacoella, Justino, and Martorano 2020). Recent research integrates these perspectives by emphasizing how status gains as well as losses shape partisan alignments. In advanced industrial democracies, negative shocks and globalization-related dislocation have fueled support for populist or anti-system parties, particularly on the far right. These parties channel discontent beyond traditional economic or redistributive politics by mobilizing cultural anxieties and presenting themselves as alternatives to mainstream elites and institutions.

while groups who perceived relative losses turned to challengers. As such, future work should consider whether export-led growth generates heterogeneous political effects depending on which groups gain or lose. We focus on economic voting and distributive responses, which are more directly linked to local labor market conditions.

Trade shocks can simultaneously shape incumbent support, policy preferences, and cultural or status grievances. Our framework extends this literature by distinguishing between upstream and downstream exposure to trade, which allows us to capture both direct and indirect channels through which integration influences local economies. Although a significant body of work in IPE and CPE seeks to understand how the economic shocks trigger or interact with cultural concerns (broadly defined), this can be very challenging or impossible to identify with aggregate data.[8] Thus, we focus on the primarily economic channels.

We summarize how each type of trade exposure is expected to influence support for the incumbent, as well as support for Left and Right parties based on a compensation/redistribution logic in Table 3. Of course, negative trade shocks may increase demand for redistribution, but whether this translates into partisan support depends on the credibility of left parties as providers of compensation and the availability of alternative political responses. Additionally, as Rettl (2025) argues, voters may also seek non-governmental forms of redistribution and social assistance.

Table 3: Electoral effects of trade

	Economic voting	Demands for redistribution	
Exposure	**Effect on incumbent support**	**Effect on Right**	**Effect on Left**
Imports	–	-	+
Upstream Import	–	-	+
Downstream Imports	+	+	-
Exports	+	+	-
Upstream Exports	+	+	-
Downstream Exports	–	-	+

Note: Exposure refers to the position of the affected industry.

Importantly, these mechanisms are not mutually exclusive: multiple political responses may be activated by the same trade shock. As a result, the interpretation of empirical findings must be

[8] We return to a discussion of the challenges and opportunities of individual level survey data in this context in the conclusion.

context-dependent. Shocks to the local economy can generate political responses through incumbent punishment or reward, as well as through shifts in partisan support driven by distributive considerations. The direction and relative strength of these responses depend on institutional features such as the party system, the set of political alternatives available to voters, and how responsibility for economic outcomes is assigned.

When a left party governs, economic voting and demands for redistribution in response to a trade shock may push electoral behavior in opposite directions, complicating interpretation. In contrast, when a right party governs, both mechanisms may operate in the same direction. Because aggregate data cannot cleanly distinguish between these channels, we remain ex ante agnostic about the net effects of positive and negative trade shocks. Our empirical design nevertheless allows us to partially differentiate between economic voting and redistribution-based responses.

4 Background on Brazil

Brazil is an interesting and important case in which to examine the political economy effects of trade shocks. First, Brazil is a large economy with variation by region. Brazil underwent a significant trade liberalization process between 1990 and 1995, which involved a substantial reduction in import tariffs from 30.5% to 12.8% (Iacoella, Justino, and Martorano 2020). Then, China's emergence in the global market after its WTO accession in 2001, profoundly affected Brazil, with China becoming Brazil's largest trading partner by 2009. Notably, in contrast to the advanced economies, Brazil experienced an increase in both exports and imports as a result of China's entry into the global economy, essentially a double integration shock, as shown in Figure 1. This "China shock" led to Brazil's increased specialization in exporting primary commodities to China, while its manufacturing sectors faced heightened competition from Chinese-manufactured imports. As a result, regions specializing in agriculture and mining benefited from the growing Chinese demand, experiencing improved labor market outcomes, whereas manufacturing-heavy areas were harmed by rising import competition (Costa, Garred, and Pessoa 2016).

Politically, Brazil is a multiparty presidential democracy composed of 26 states and over 5,500 municipalities, with a federal system that grants considerable autonomy to subnational govern-

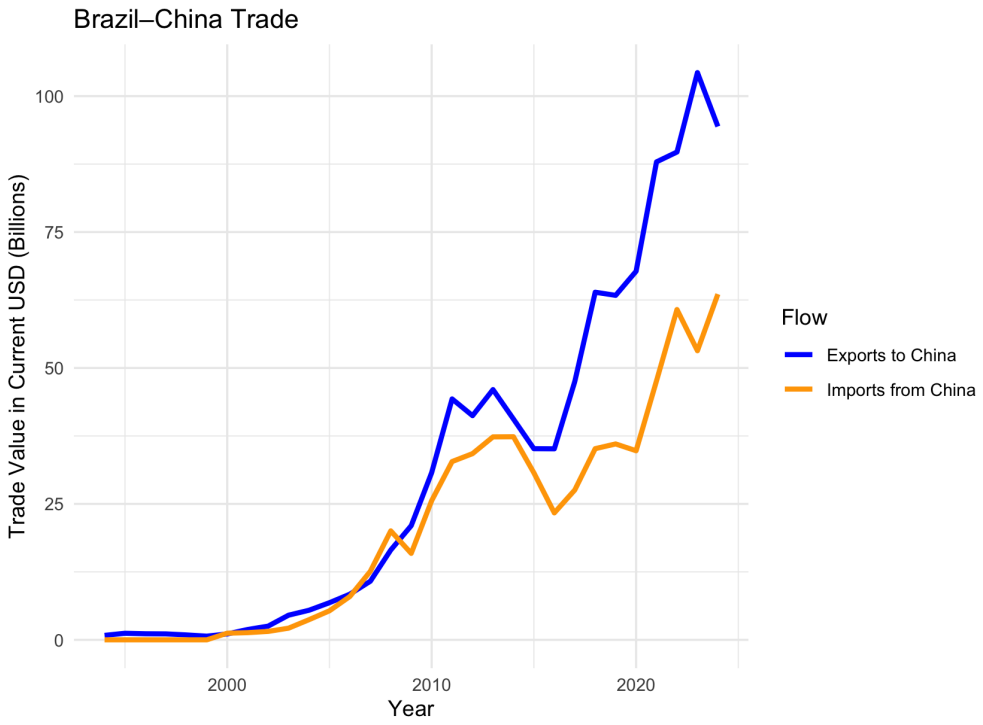
ments. Presidential elections are held every four years under a two-round runoff system: if no candidate secures more than 50% of the vote in the first round, the top two contenders advance to a second round. Voting is mandatory for those 18-70, leading to consistently high turnout.

During the period examined in this study, the Workers' Party (Partidos dos Trabalhadores - PT) emerged as either the incumbent or the primary opposition party, with its most notable electoral breakthrough occurring in 2002 when Luiz Inácio Lula da Silva—then widely viewed as a left-populist challenger—was elected president. Lula largely continued the macroeconomic policies of his predecessor, but implemented a progressive set of social policies. The PT advanced a redistributive agenda focused on poverty alleviation, notably through flagship programs such as Bolsa Família, which lifted millions of Brazilians out of poverty and expanded social protections across the country (Hunter and Power 2007; Samuels and Zucco 2018b). These policies helped reshape Brazil's political economy and contributed to the PT's electoral appeal among historically marginalized groups. PT is thus the organizing feature of Brazilian politics, with citizens having strong pro- or anti-PT opinions. There is no other party with a similar strong view (Samuels and Zucco 2018b).

Importantly, Brazil experienced a series of major political and economic shocks during the period covered by this study, which inform our empirical strategy. In response to the 2008 global financial crisis, the PT government shifted its economic policy stance, expanding public lending and increasing the state's role in the economy. In late 2014, Brazil entered its worst recession in recent memory,[9] driven by multiple factors, including the end of the commodity boom. Dilma Rousseff, elected in 2010 as Lula's successor and re-elected in a tightly contested race in 2014, was impeached in 2016 amid mounting political pressure and allegations of fiscal misconduct. The period was also marked by numerous corruption scandals involving the PT. Following Rousseff's removal, her vice president Michel Temer (MDB) assumed the presidency. Temer, deeply unpopular and barred from running in 2018 due to campaign finance violations, did not seek re-election. Lula, the PT's standard bearer and a figure more popular than the party he leads, was also ruled ineligible to run due to a 2017 corruption conviction. As a result, a relatively unknown running mate,

[9] https://www.elibrary.imf.org/display/book/9781484339749/ch002.xml.

Figure 1: Brazil's Trade with China, 2000–2024



Note: Trade values in billions of USD, non-inflation adjusted. Data from UN Comtrade.

Fernando Haddad, former mayor of Sao Paolo, led the PT ticket in 2018. He was defeated by Jair Bolsanoro, who campaigned on a platform of social conservatism and nationalism. The 2018 election of Jair Bolsonaro marked a rupture in the political system (Samuels, Mello, and Zucco 2024). See also the discussion of Hunter and Power (2019), who discuss how this multipronged crisis for Brazil and PT plus the collapse of the center/center right created an opportunity for Bolsanaro.

Table 4: Brazil presidential election results (second round), 2002–2022

Year	PT	Vote share	Opponent	Vote share
2002	Lula	**61.27%**	Serra (PSDB)	38.73%
2006	Lula	**60.83%**	Alckmin (PSDB)	39.17%
2010	Rousseff	**56.05%**	Serra (PSDB)	43.95%
2014	Rousseff	**51.64%**	Neves (PSDB)	48.36%
2018	Haddad	44.87%	Bolsonaro (PSL)	**55.13%**
2022	Lula	**50.90%**	Bolsonaro (PL)	49.10%

Note: Lula was the planned candidate in 2018 but was deemed ineligble.

5 Empirical approach and data

Our unit of analysis is the microregion-by-year level. Microregions consist of multiple municipalities and are comparable to commuting zones or local labor markets in the United States; there are 558 microregions in Brazil. We take changes in PT presidential vote shares and labor market outcomes as dependent variables; we construct measures of microregion-by-year level trade exposure, which are our main independent variables. We first describe our data and the construction of trade exposure measures. We then turn to our empirical approach.

5.1 Data

5.1.1 Direct Trade Exposure Measures

We ultimately construct six measures of trade exposure: (direct) import and export exposure, upstream import and export exposure, and downstream import and export exposure. The direct import and export exposure measures we construct are similar to those used elsewhere in the literature on the "China Shock" (e.g., Autor, Dorn, and Hanson (2013)) and, in particular, largely follow the data construction of Costa, Garred, and Pessoa (2016). For now, we focus on the direct measures, describing the data used to construct them, and then discuss how these are extended to incorporate upstream and downstream linkages afterwards.

As is standard in the literature, the (direct) trade exposure measures we construct start from a base year (in our case, 2000), before global trade activity with China significantly increased. We measure the industry composition of workers in each microregion in that base year. The base-year industrial composition dictates which microregions will be more vs. less impacted by the rise of China in the global economy. For example, soybeans became a major export from Brazil to China; microregions more specialized in soybean production would soon benefit. Let $\frac{Emp_{ir}}{Emp_r}$ denote the share of workers in microregion r who work in industry j in the year 2000. We then calculate nationwide changes in trade flows by industry for each year relative to the base-year. Let ΔM_{it} denote the dollar value of imports from China in industry j in year t minus the dollar value of imports from China in that industry in 2000; let ΔX_{it} denote the same, but for exports to China. The product of these two objects, summed across all industries within a microregion, forms a measure that

captures the expected local labor market impact of trade exposure. The measure is meant to isolate changes in labor market activity stemming from pre-existing conditions and exogenous forces (in this case, the rise of China in the global economy), and critically not incorporating year-to-year changes in actual local labor market conditions, which may be endogenous to the outcomes we consider.

That is all captured in the following equations, which represent our direct import and export exposure measures:

$$\Delta IE_{rt} = \sum \frac{Emp_{jr}}{Emp_r} \frac{\Delta M_{jt}}{Norm_j} \tag{1}$$

$$\Delta XE_{rt} = \sum \frac{Emp_{jr}}{Emp_r} \frac{\Delta X_{jt}}{Norm_j} \tag{2}$$

All terms are as defined above. Following Costa, Garred, and Pessoa (2016), $Norm_j$ is simply the nationwide number of workers in industry j, meant to normalize the magnitude of the change in import or export dollar value by the prominence of the industry.

To construct base-year industry employment shares, we start with Brazilian Census microdata from the year 2000 – a sample of roughly 11 percent of the population. An advantage of the Census relative to some other potential data sources is that it includes information on formal and informal sector workers. We restrict the data to individuals aged 18-60, given our interest in individuals in the labor market. We then collapse the counts of individuals to the microregion-by-industry level, using a shortened version of industry codes in the Census from Costa, Garred, and Pessoa (2016). The shortened version of industry codes allows us to merge these data with trade data. There are 82 total traded industries in our data. This process leaves us with data on microregion-by-industry counts of workers in the year 2000, which we then divide by total workers in the microregion in that year ($\frac{Emp_{jr}}{Emp_r}$). The $Norm_j$ variables (nationwide counts of workers by industry) are also constructed from the Census data.

To calculate changes in trade flows (ΔX_{jt} and ΔI_{jt}), we draw on the BACI Database, developed by the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). The BACI database provides annual-level data on bilateral trade flows for 200 countries at the product level, measured as the dollar value of imported and exported goods. We draw on the imports from China to Brazil and exports from Brazil to China. We also draw on imports and exports between China

and the rest of the world. The latter are used to construct instrumental variables, discussed more below. All other bilateral linkages are discarded. We use the industry concordance produced by Costa, Garred, and Pessoa (2016) so that industry codes match those used in our Census data, aggregating import and export values into the smaller set of industry codes used there. Because of our focus on presidential elections and also to smooth the data, rather than using single-year trade values, we combine trade flow data from the four years preceding a presidential election. That is, in identifying the dollar value of imports in industry i in 2014, we in fact take the average from 2011-2014.

5.1.2 Upstream and Downstream Trade Exposure Measures

We calculate upstream and downstream exposure to imports and exports following the method of Acemoglu et al. (2016), adapting it to Brazil's national input-output structure. "Upstream" and "downstream" refer to the direction of the trade shock relative to a domestic industry's position in the production network. Thus, upstream import exposure captures the vulnerability of industry j to import shocks in the industries to which it sells. That is, industry j is more exposed to imports in industries i that purchase heavily from j. Downstream import exposure, by contrast, reflects a beneficial effect: industry j may gain from import penetration in industries i from which it sources intermediate inputs, as cheaper or higher-quality inputs become available. Upstream and downstream export exposure is calculated similarly. Upstream export exposure benefits industry j, as those it sells to expand. Downstream export exposure may harm industry j, as intermediate inputs became more expensive.

We calculate this using a normalized inverse Leontief matrix W, where each entry w_{ji} denotes the exposure of industry j to changes in industry i, based on the amount that j sells to i in the case of upstream exposure, or the amount that j purchases from i in the case of downstream exposure.[10] Thus, the downstream import and export exposures of j are calculated as:

$$\Delta IE^{D}_{jt} = \sum_{i} w_{ji} \Delta M_{it} \tag{3}$$

[10]To compute subtract the diagonal to remove direct own-industry effects. We row- and column-normalize for the upstream and downstream effects, respectively.

$$\Delta XE^{D}_{jt} = \sum_{i} w_{ji} \Delta X_{it} \tag{4}$$

and upstream import and export exposure of j are calculated as:

$$\Delta IE^{U}_{jt} = \sum_{i} w_{ij} \Delta M_{it} \tag{5}$$

$$\Delta XE^{U}_{jt} = \sum_{i} w_{ij} \Delta X_{it} \tag{6}$$

Here, we go beyond Acemoglu et al. (2016) and Chagas and Sant'Anna (2024), who calculate these measures for industries, not local labor markets.[11] To construct region-level measures, we compute labor-weighted exposure following the above strategy:

$$\Delta IE^{D}_{rt} = \sum \frac{Emp_{jr}}{Emp_{r}} \frac{\Delta IE^{D}_{jt}}{Norm_{j}} \tag{7}$$

$$\Delta IE^{U}_{rt} = \sum \frac{Emp_{jr}}{Emp_{r}} \frac{\Delta IE^{U}_{jt}}{Norm_{j}} \tag{8}$$

As is the case for direct import and export exposure, we weight exposure to the shocks by the share of workers in a given region r in each industry j. We construct analogous measures for upstream imports, and upstream and downstream exports. These measures capture how exposed workers in r are to indirect changes in trade flows based on supply chains.

Weights for upstream and downstream exposure are drawn from the 2000 inverse Leontief matrix, published by the IBGE.[12] We use the year 2000 so that exposure to these shocks is exogenous to future changes in the structure of the economy that result from the China shock. Brazilian input-output tables utilize the System of National Accounts; there are 55 activities in the 2000 tables. The trade and employment data are available–as per the above discussion–for 82 CNAE domestic

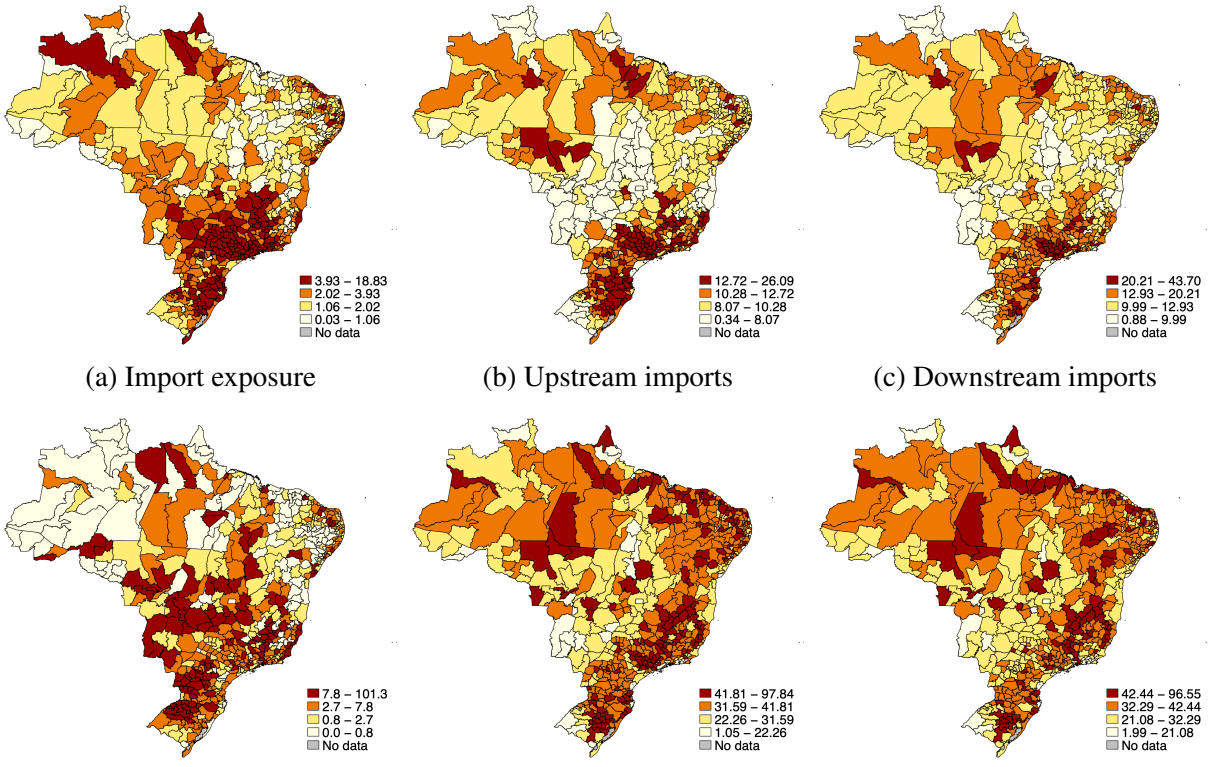
[11] See Pierce, Schott, and Tello-Trillo (2024) who do this in the U.S. context.

[12] https://www.ibge.gov.br/en/statistics/economic/national-accounts/16940-input-output-matrix.html?edicao=19846&t=downloads .

codes. We crosswalk these input-output activities to the relevant CNAE codes.[13]

Figure 2 presents maps showing the distribution of direct and indirect exposure for 2014 (relative to 2002).[14] The far left columns (a and d) present the direct effects of trade exposure. The graphs of the indirect effects show more extensive and varied exposure. For instance, the northwest, which is moderately exposed to negative import shocks (direct and upstream), is exposed to both positive and negative indirect shocks in terms of exports.

Figure 2: Direct and indirect exposure to the China shock (2014)



(a) Import exposure (b) Upstream imports (c) Downstream imports

(d) Exports (e) Upstream exports (f) Downstream exports

[13]This involves two crosswalks. First, from SCN to CNAE and then CNAE domiciliar for the employment data (the codes used in the Census). Trade is also crosswalked to the Census data as described above.

[14]Additional years to be added to appendix.

5.1.3 Outcome Measures and Control Variables

We have two main categories of outcome measures. Our main outcome measure is the change in the share of votes received by PT in each of the 2010, 2014, 2018 and 2022 presidential elections, measured at the microregion level relative to the 2002 election. We denote the change in year t relative to 2002 in microregion i as ΔPT_{it}.

The presidential election year data is from the Tribunal Superior Eleitoral (TSE).[15] We calculate the vote share for PT in the final round of the presidential election at the level of microregion, by aggregating from municipality to the microregion.

In a set of additional analyses, we document that our trade exposure measures impact local labor market outcomes as expected by our theory, again drawing on Census microdata. Our main outcome is regression-adjusted microregion-level change in average earnings from 2000 to 2010. As such, we use both of the 2000 and 2010 Censuses. At the individual-level, we first regress the log of earnings in both Censuses on a vector of individual-level controls: race/ethnicity, sex, age, and a dummy for whether the individual has at least 11 years of education. We then store the residual of that regression, average it to the microregion-by-year level, and take the difference between 2010 and 2000. That provides an aggregate measure of local earnings at the same level as our analysis on presidential elections, but accounting for and differencing out any part of that that would be driven by demographic composition of workers in the area (or in the Census sample). At this time, microdata from the 2022 Census is not yet readily available.[16]

Note that we also use the Census data to construct a series of controls. Specifically, from the 2000 Census microdata (restricted to ages 18-60), we calculate for each microregion: the share of workers in agriculture, the share of workers in manufacturing, the share of workers in non-traded industries, shares of workers by race/ethnic group, the average income, the share of workers with at least 11 years of education, and the total workforce count.

[15] Election years 2002-2014 are accessed through the R package electionsBR. 2018 and 2022 are downloaded directly from the TSE.

[16] The census was intended to be implemented in 2020, but was postponed due to the covid-19 pandemic.

5.2 Empirical Approach

With the above-outlined data in hand, we adopt an instrumental variables strategy common in the literature to our setting. To build toward that, we begin by outlining the baseline OLS specification. We first note that the OLS version of our key regression, when focusing on presidential elections, could be described as:

$$\Delta PT_{rt} = \alpha + \beta_1 IE_{rt} + \beta_2 XE_{rt} + \beta_3 IE^U_{rt} + \beta_4 XE^U_{rt} + \beta_5 IE^D_{rt} + \beta_6 XE^D_{rt} + \boldsymbol{X_r} + \varepsilon_{rt} \quad (9)$$

Recall from above that ΔPT_{it} is the change in PT Vote Share for microregion r in year t relative to 2002. The import and export exposure measures are as described in the previous section. Note that these are based on differences relative to the year 2002 as well. Thus, the whole regression can roughly be considered a first-differences specification, regressing change in PT Vote Share on change in import and export exposure. $\boldsymbol{X_i}$ is the vector of microregion-level controls drawn from 2000 Census data, also described in the prior section.

We estimate this model separately for each presidential election from 2010 to 2022. This choice is central to our identification strategy. Estimating vote share changes relative to 2002 allows us to hold the initial political baseline constant and trace how evolving economic exposure translates into political shifts over time. In essence, this allows us to understand the cumulative effect of changes in the nature of trade with China. This is significant because the effects can be both slow and stack up over time.[17] Further, by estimating separate regressions by year, we avoid imposing linear or parametric assumptions about the evolution of PT support, allowing us to capture temporal heterogeneity in how trade exposure maps onto political outcomes.

From a political economy perspective, this strategy reflects our expectation that the relationship between trade exposure and PT support may vary across elections depending on the broader political and economic context. The PT remained the central pole of Brazilian politics throughout this period—-either in government or as the main opposition party—-but the nature of the political landscape changed significantly across elections. The 2008 global financial crisis, the onset of

[17]For instance, in the U.S. context, scholars have demonstrated the persistence of economic and political effects of NAFTA liberalization and the China shock.

economic contraction in 2014, and the impeachment of Dilma Rousseff, conviction of Lula, and subsequent rise of Bolsonaro all represent major structural breaks in the political and economic context. A pooled model with interactions or fixed effects would risk obscuring these nonlinear dynamics or attributing context-specific variation to the average effect. Instead, our election-by-election approach allows us to examine whether—-and how-—the political consequences of trade shocks evolve as Brazil undergoes economic volatility and political realignment.

With regard to identification, the import and export exposure measures here are already constructed so as to attempt to isolate the causal impacts of trade exposure on election outcomes in that they are measured based on base-year characteristics of a microregion (industrial composition in 2000) interacted with nationwide (not local) changes in imports and exports by industry. That is in contrast, for example, to estimating a similar model but with time-varying microregion-level average income as the independent variable; in such a regression, we would be concerned by standard omitted variable concerns – e.g., that anything occurring locally that is driving higher incomes (perhaps a more educated populace) is also shaping political preferences and activity. Again, as is standard in the literature, by constructing measures that are not based on time-varying local labor market conditions, we are already insulated from such immediate concerns.

Still, it is common to instead adopt a two-stage least-squares (2SLS) approach to further support a causal interpretation. In the US context, for example, Autor, Dorn, and Hanson 2013 note that "realized U.S. imports from China ... may be correlated with industry labor demand shocks" (9). In our context, for example, that might mean that growth in exports in textiles from China to Brazil may be a reflection of domestic factors drawing workers and capital away from textile production in Brazil, reintroducing some endogeneity into the OLS specification outlined above. Instead, we would prefer to rely on variation stemming only from the outside-of-Brazil entry of China into the global economy and how that interacts with the industries that local labor markets are already specialized in. As such, as others do (including, e.g., Costa, Garred, and Pessoa (2016)), we construct parallel import and export exposure measures that are identical to those outlined in equations 1 and 2 (and their upstream and downstream parallels) but that replace the "change in imports/exports" term (ΔM_{it}, ΔX_{it}) with the changes in imports or exports between the *rest of world (excluding Brazil)* and China. We then use those as instruments for our main measures. In addition to further purging endogeneity from our specification, the 2SLS specification also helps

address measurement error. There are some large year-to-year spikes in imports and exports between Brazil and China for some industries that may be attributable to such error; the 2SLS helps address that. As such, our main approach matches what is described in equation 9, but estimated as 2SLS using rest-of-world parallels to each import and export measure as instruments for those appearing in the equation. We cluster standard errors at the mesoregion level, which is a grouping of microregions.

We present the first-stage estimates from our two-stage least squares specifications in Appendix Tables A.1 and A.2. The tables report the F-statistic of the excluded instruments, testing the strength of our instrumental variables. In general, F-statistic is consistently quite high – always greater than 10 and generally much higher than that.

While equation 9 describes the estimating equation for our presidential election outcome, we use the same approach to estimate the impacts on labor market outcomes – taking the change in regression-adjusted average earnings between 2010 and 2000 as our outcome.

6 Results

6.1 Labor market effects

We first present our results that examine the change in average earnings as the outcome. This is an important first step in which we document that our import and export exposure measures impact local labor markets as expected. This evidence supports our mechanism that links real impacts on local labor market outcomes to changes in PT vote share.

Table 5 presents our results. Both columns use the 2SLS approach. Column 1 uses a simpler specification than outlined in Equation 9, only accounting for direct import and export exposure, like much of the China shock literature. We find that export exposure has positive impacts on earnings, as expected, while import exposure has no statistically significant effect. This is similar to findings reported by Cavalcante, Moreno-Louzada, and Menezes Filho (2023).

Turning to Column 2, where we include our full set of import and export exposure measures, we see that Column 1 conceals some impacts of trade exposure that are missed without accounting for supply chain linkages. Upstream import exposure is associated with a significant decline in local

Table 5: Impacts of China Trade Exposure on Labor Market Outcomes

VARIABLES	(1) Earnings (Resid.) 2010 vs 2000	(2) Earnings (Resid.) 2010 vs 2000
Imp. Exp.	-0.004	-0.004
	(0.003)	(0.006)
Up Imp. Exp.		-0.024**
		(0.010)
Down Imp. Exp.		0.015***
		(0.005)
Ex. Exp.	0.003**	0.007
	(0.001)	(0.005)
Up Ex. Exp.		0.010**
		(0.005)
Down Ex. Exp.		-0.008*
		(0.005)
Observations	405	405

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference between 2010 and 2000 residualized earnings, averaged to microregion-level. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

earnings. That is to be expected as upstream import exposure captures the effects of purchasers of goods from industry j facing import competition, which leads them to demand less j; areas specialized in j are therefore indirectly negatively impacted. The reverse is true of upstream *export* exposure, wherein purchasers of j demand more j because they face increased demand from China for their own goods. Areas specialized in j should therefore indirectly benefit; indeed, we find that upstream export exposure has a significant positive impact on earnings. We find that downstream import exposure is associated with a positive and significant change in local earnings. That too aligns with our expectations: downstream import exposure captures import competition faced by suppliers of industry j. More competition for inputs into j would reduce the cost of production and lead to gains for areas specialized in j. Finally, downstream export exposure should have the opposite effect (for similar reasons, but in reverse), and in Table 5 we find that it does.

In short, accounting for supply chain linkages in constructing measures of trade exposure reveals more nuanced ways in which real labor market outcomes are impacted.[18] Having documented how and when this more complete accounting of trade exposure impacts local earnings, we now turn to our main focus, which is the impact on presidential election vote shares.

6.2 Election results

We first present a simpler specification only accounting for direct trade exposure. Results are in Table 6. Each column presents the results for a different election relative to the 2002 election. This allows us to examine the net effect of trade exposure on voters' support for PT. In elections 2010, 2014, and 2018, PT can be considered the incumbent party. Thus, our coefficient estimates reflect the competing pressures of economic voting (reward/punishment of incumbent) and demand for redistribution. The 2022 election is different because the incumbent party is the far-right, and PT is the opposition.[19] Thus, in this election, the economic voting channel operates in a different direction than the other election. As such, our interpretation of the coefficient estimates will differ. Additionally, the analysis of the 2022 election is useful to assess whether the patterns we detect specifically drive outcomes in elections where Bolsonaro was a candidate (2018 and 2022) or

[18] See Pierce, Schott, and Tello-Trillo (2024) for similar analysis in the U.S.

[19] Of course, Lula, a two-term president and father of PT, is the candidate in 2022.

Table 6: Impacts of China Trade Exposure on Support for PT, Only Allowing for Effects of Direct Trade Exposure

	(1)	(2)	(3)	(4)
	PT Share	PT Share	PT Share	PT Share
VARIABLES	2010 vs 2002	2014 vs 2002	2018 vs 2002	2022 vs 2002
Imp. Exp.	0.546*	0.066	0.401	0.592**
	(0.319)	(0.213)	(0.364)	(0.284)
Ex. Exp.	-0.185***	-0.116**	-0.243***	-0.166***
	(0.064)	(0.053)	(0.084)	(0.053)
Observations	558	558	558	558

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Vote Share (with "y" as noted in column header) vs 2002 PT Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

whether we detect a more general phenomenon across all years.

The short takeaway is that our results reflect net effects in which redistributive responses outweigh economic voting. Although trade shocks plausibly generate incumbent punishment or reward, the observed patterns are more consistent with voters on balance responding through demands for redistribution than through retrospective evaluation of incumbents. When we do not fully account for direct and indirect trade exposure (Table 6), direct export exposure leads to reduced PT share and import exposure (in some years) leads to increased PT share. This suggests less demand for redistribution in areas that benefitted from exports and some increase in support (demand for redistribution) in areas that were affected by direct import competition.

However, the central thrust of our paper – as evidenced in Table 5 – is that a more complete accounting of supply chain linkages in constructing trade exposure measures better captures the nuanced effects of trade exposure on local labor market outcomes. Likewise, we expect that such measures are necessary to capture the impact on political outcomes. Tables 7 and 8 do so for the 2018 and 2022 elections respectively. Due to some concerns about correlations between the upstream and downstream exposure measures, we present results building from direct effects only

(column 1) to introducing only one set of indirect measures at a time (columns 2 and 3) to ultimately include all six coefficients (column 4).[20]

Table 7: Impacts of China Trade Exposure on Support for PT (2018), Allowing for Effects of Direct and Indirect Trade Exposure

	(1)	(2)	(3)	(4)
	PT Share	PT Share	PT Share	PT Share
VARIABLES	2018 vs 2002	2018 vs 2002	2018 vs 2002	2018 vs 2002
Imp. Exp.	0.401	0.902	0.959	0.385
	(0.364)	(0.602)	(0.625)	(0.616)
Up Imp. Exp.		-1.232		-1.620
		(0.774)		(1.161)
Ex. Exp.	-0.243***	-0.102	-0.197**	-0.081
	(0.084)	(0.090)	(0.085)	(0.087)
Up Ex. Exp.		0.511***		1.317***
		(0.147)		(0.248)
Down Imp. Exp.			-0.684	1.246
			(0.754)	(1.414)
Down Ex. Exp.			-0.083	-1.190***
			(0.213)	(0.283)
Observations	558	558	558	558

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Vote Share (with "y" as noted in column header) vs 2002 PT Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

Comparing the 2018 and 2022 elections provides insight into how economic voting and redistributive motivations interact under different political conditions. In 2018, when the Workers' Party (PT) was the incumbent, the results in Table 7 indicate that regions benefiting from trade through indirect channels—most notably upstream export exposure—were more likely to support the PT, while regions adversely affected through downstream export exposure were less likely to do so. These patterns align closely with the labor-market consequences of trade exposure doc-

[20]We present results for the 2010 and 2014 elections in the Appendix.

Table 8: Impacts of China Trade Exposure on Support for PT (2022), Allowing for Effects of Direct and Indirect Trade Exposure

	(1)	(2)	(3)	(4)
	PT Share	PT Share	PT Share	PT Share
VARIABLES	2022 vs 2002	2022 vs 2002	2022 vs 2002	2022 vs 2002
Imp. Exp.	0.592**	1.040***	0.841**	0.243
	(0.284)	(0.358)	(0.396)	(0.415)
Up Imp. Exp.		-1.137**		-2.463**
		(0.487)		(0.970)
Ex. Exp.	-0.166***	-0.093*	-0.152***	-0.043
	(0.053)	(0.055)	(0.052)	(0.058)
Up Ex. Exp.		0.249***		0.711***
		(0.084)		(0.149)
Down Imp. Exp.			-0.278	2.323**
			(0.498)	(1.095)
Down Ex. Exp.			-0.035	-0.678***
			(0.111)	(0.159)
Observations	558	558	558	558

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Vote Share (with "y" as noted in column header) vs 2002 PT Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

umented earlier and suggest that distributive gains and losses transmitted through supply chains shaped electoral responses. Notably, these findings differ from those based on direct trade exposure alone, where negative export coefficients could be interpreted as trade winners shifting away from the left due to diminished demand for redistribution. Accounting for supply-chain position, the findings suggest that export-related gains and losses have heterogeneous political effects that aggregate measures obscure.

The 2022 election, in which Jair Bolsonaro was the incumbent and the PT competed as the opposition, offers a contrasting institutional context. In this case, economic voting and redistributive motivations operate in the same direction with respect to support for the PT. Yet the findings are mixed. As shown in Table 8, regions exposed to direct import exposure, a negative trade shock, were more likely to support PT, consistent with both incumbent punishment and increased demand for compensation. Analogously, direct export exposure is associated with a decrease in support for PT. Yet the coefficients on indirect effects are statistically significant in the direction opposite to expectations. Negative indirect shocks appear to decrease support for PT (upstream import and downstream export exposure), while positive shocks (upstream export and downstream imports) decrease support.

Taken together, these results underscore the presence of multiple political mechanisms linking trade exposure to voting behavior. When the PT governs, economic voting and redistributive considerations may offset one another, muting aggregate effects. When the PT competes as the opposition, these mechanisms reinforce one another, producing clearer electoral responses, at least with respect to direct measures of exposure. This highlights the importance of interpreting trade-exposure coefficients as net effects that aggregate multiple political responses, rather than as evidence of a single dominant mechanism.

We have also estimated similar specifications taking PT's Vote Share in the first round of voting as our outcome, where voters are better able to express their preferences than in the second round. Results are presented in Tables A.7 and Tables A.8 for 2018 and 2022 respectively. Results are similar to those presented in the main text.

We have also estimated supply chain linkages using only first order linkages, rather than the full linkages captured by the inverse Leontief. In future iterations, we plan to add additional control variables to capture changes in the composition of communities (e.g. Autor et al. 2025), the share

of Bolsa Familia recipients, and the share of evangelicals.

Conclusions

This paper revisits the political consequences of the China shock in an emerging economy, extending the regional trade shocks literature in two key ways. First, we examine Brazil, a context in which trade integration with China has involved both import competition and export expansion, and where the electoral implications of these shocks remain comparatively understudied. Second, we distinguish between direct and indirect exposure to trade through global supply chains, allowing us to capture how gains and losses propagate across regions in ways that aggregate trade measures obscure.

Our findings underscore the importance of accounting for both the nature of trade shocks and their transmission through production networks. When trade exposure is measured only through direct imports and exports, the results suggest a compensation-based interpretation: regions exposed to import competition tend to increase support for the Workers' Party (PT), while regions benefiting from exports reduce support, consistent with diminished demand for redistribution among trade winners. However, once we incorporate upstream and downstream exposure, a more nuanced pattern emerges. Negative shocks transmitted through supply chains—such as upstream import exposure and downstream export exposure—are associated with reduced support for the PT or the incumbent more generally, while positive shocks—most notably upstream export exposure—are associated with increased support. These patterns closely mirror observed labor market effects and highlight that electoral responses to trade reflect net outcomes of competing political responses rather than a single dominant mechanism.

The interaction between economic voting and redistributive politics is central to interpreting these results. When the PT governs, these two mechanisms may push electoral behavior in opposing directions, muting aggregate effects. By contrast, when a right-wing incumbent governs, as in 2022, the mechanisms may reinforce one another. Despite these differences, we find remarkable stability in the relationship between trade exposure and support for the PT across elections, including contests against both centrist and far-right challengers. This stability suggests that the political

effects of trade shocks in Brazil operate through persistent local economic conditions rather than short-term electoral dynamics.

Our analysis focuses on material economic interests at the regional level, but important questions remain about how these interests interact with social identities and non-material considerations. Brazil exhibits substantial regional and sectoral sorting by race, education, and gender, raising the possibility that trade-induced economic changes may intersect with status-based dynamics. While we do not find evidence that the trade determinants of PT support differ systematically in elections featuring a far-right challenger, future work using individual-level data could shed light on how material and non-material mechanisms jointly shape political behavior.

More broadly, the Brazilian case highlights both the promise and the limits of extending China-shock frameworks to emerging economies. Institutional context, party systems, and the structure of trade integration all condition how economic shocks translate into political outcomes. Countries that experienced greater export competition in third markets, such as Mexico, or that face different constraints on redistribution may exhibit distinct patterns of political response. Comparative work that incorporates supply-chain exposure alongside domestic political institutions is therefore essential for understanding the global political consequences of trade.

Finally, our analysis emphasizes long-run exposure to trade shocks, but population mobility may play an important mediating role. Migration can either dampen or amplify the local economic and political effects of trade by redistributing workers across regions. Understanding how migration interacts with trade exposure represents an important avenue for future research, particularly in emerging economies undergoing rapid structural change.

Taken together, our findings caution against interpreting trade-exposure coefficients as evidence of a single political mechanism. Instead, they highlight the importance of viewing electoral responses to globalization as the aggregation of multiple, context-dependent political reactions operating along global production networks.

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A Appendix

Table A.1: First-Stage Regressions, 2 Coefficient

	(1)	(2)
VARIABLES	Imp. Exp.	Ex. Exp.
IV: Imp. Exp.	0.004***	-0.008***
	(0.000)	(0.002)
IV: Ex. Exp.	-0.000	0.017***
	(0.000)	(0.003)
Observations	558	558
F-stat.	330.6	13.42

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are ordinary least squares, taking instrumented variables as outcomes and instrumental variables as independent variables. We use the version of both from 2022. Unit of observation is the microregion. We include the same controls as in our 2SlS: Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level. **F-stat included in the final row of the table is the F-stat of the two instruments.**

Table A.2: First-Stage Regressions, 6 Coefficient

VARIABLES	(1) Imp. Exp.	(2) Up Imp. Ex.	(3) Down Imp. Ex.	(4) Ex. Exp.	(5) Up Ex. Ex.	(6) Down Ex. Ex.
IV: Imp. Exp.	0.004***	-0.001	-0.002**	-0.005***	0.003**	-0.000
	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
IV: Up Imp. Exp.	-0.000	0.001**	-0.001	-0.004	-0.011***	-0.005***
	(0.000)	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)
IV: Down Imp. Exp.	0.000	0.007***	0.023***	0.005	-0.003	-0.010***
	(0.000)	(0.002)	(0.002)	(0.005)	(0.003)	(0.003)
IV: Ex. Exp.	-0.000	0.003***	0.001***	0.018***	-0.001	0.000
	(0.000)	(0.001)	(0.000)	(0.004)	(0.001)	(0.001)
IV: Up Ex. Exp.	-0.000	0.005***	-0.001	-0.000	0.018***	0.000
	(0.000)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
IV: Down Ex. Exp.	0.000	-0.004***	-0.001	-0.005*	0.003	0.021***
	(0.000)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
Observations	558	558	558	558	558	558
F-stat.	168.3	127.4	155.5	5.505	88.63	73.04

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are ordinary least squares, taking instrumented variables as outcomes and instrumental variables as independent variables. We use the version of both from 2022. Unit of observation is the microregion. We include the same controls as in our 2SlS: Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level. **F-stat included in the final row of the table is the F-stat of the six instruments.**

Table A.3: Impacts of China Trade Exposure on Support for PT (2010)

VARIABLES	(1) PT Share 2010 vs 2002	(2) PT Share 2010 vs 2002	(3) PT Share 2010 vs 2002	(4) PT Share 2010 vs 2002
Imp. Exp.	0.546*	0.674	0.739*	0.766
	(0.319)	(0.518)	(0.426)	(0.472)
Up Imp. Exp.		-0.268		-1.187
		(0.541)		(0.759)
Ex. Exp.	-0.185***	-0.080	-0.178**	0.058
	(0.064)	(0.141)	(0.084)	(0.174)
Up Ex. Exp.		0.280**		1.199***
		(0.124)		(0.303)
Down Imp. Exp.			-0.077	0.527
			(0.225)	(0.329)
Down Ex. Exp.			-0.152	-1.121***
			(0.094)	(0.266)
Observations	558	558	558	558

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Vote Share (with "y" as noted in column header) vs 2002 PT Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

Table A.4: Impacts of China Trade Exposure on Support for PT (2014)

VARIABLES	(1) PT Share 2014 vs 2002	(2) PT Share 2014 vs 2002	(3) PT Share 2014 vs 2002	(4) PT Share 2014 vs 2002
Imp. Exp.	0.066	0.535	0.265	0.224
	(0.213)	(0.368)	(0.429)	(0.419)
Up Imp. Exp.		-0.907*		-1.544**
		(0.473)		(0.652)
Ex. Exp.	-0.116**	-0.032	-0.095*	0.007
	(0.053)	(0.063)	(0.057)	(0.065)
Up Ex. Exp.		0.275***		0.670***
		(0.060)		(0.126)
Down Imp. Exp.			-0.191	0.961
			(0.445)	(0.608)
Down Ex. Exp.			-0.048	-0.561***
			(0.079)	(0.136)
Observations	558	558	558	558

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Vote Share (with "y" as noted in column header) vs 2002 PT Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

Table A.5: Impacts of China Trade Exposure on Support for PT (2018), Weighted by Workforce Size

	(1)	(2)	(3)	(4)
	PT Share	PT Share	PT Share	PT Share
VARIABLES	2018 vs 2002	2018 vs 2002	2018 vs 2002	2018 vs 2002
Imp. Exp.	0.727	2.365**	3.312***	2.811**
	(0.747)	(1.056)	(1.159)	(1.223)
Up Imp. Exp.		-2.436**		-1.286
		(1.135)		(2.249)
Ex. Exp.	-0.698**	-0.375*	-0.510*	-0.367*
	(0.278)	(0.216)	(0.263)	(0.208)
Up Ex. Exp.		0.448		1.218***
		(0.280)		(0.415)
Down Imp. Exp.			-2.937*	-1.177
			(1.678)	(3.560)
Down Ex. Exp.			-0.384	-1.335*
			(0.527)	(0.685)
Observations	558	558	558	558

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Vote Share (with "y" as noted in column header) vs 2002 PT Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

Table A.6: Impacts of China Trade Exposure on Support for PT (2022), Weighted by Workforce Size

	(1)	(2)	(3)	(4)
	PT Share	PT Share	PT Share	PT Share
VARIABLES	2022 vs 2002	2022 vs 2002	2022 vs 2002	2022 vs 2002
Imp. Exp.	1.020	2.343***	2.985***	2.652**
	(0.633)	(0.687)	(0.820)	(1.055)
Up Imp. Exp.		-1.973***		-1.372
		(0.642)		(2.053)
Ex. Exp.	-0.468**	-0.321**	-0.338**	-0.268**
	(0.184)	(0.146)	(0.143)	(0.127)
Up Ex. Exp.		0.207		0.595***
		(0.135)		(0.222)
Down Imp. Exp.			-2.105**	-0.613
			(1.067)	(3.097)
Down Ex. Exp.			-0.141	-0.615*
			(0.225)	(0.350)
Observations	558	558	558	558

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Vote Share (with "y" as noted in column header) vs 2002 PT Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

Table A.7: Impacts of China Trade Exposure on Support for PT (2018), Round 1

	(1)	(2)	(3)	(4)
	PT Rd. 1	PT Rd. 1	PT Rd. 1	PT Rd. 1
VARIABLES	2018 vs 2002	2018 vs 2002	2018 vs 2002	2018 vs 2002
Imp. Exp.	0.039	0.398	0.560	0.094
	(0.260)	(0.519)	(0.524)	(0.524)
Up Imp. Exp.		-0.959		-0.970
		(0.694)		(0.938)
Ex. Exp.	-0.133*	-0.022	-0.089	-0.006
	(0.076)	(0.079)	(0.070)	(0.079)
Up Ex. Exp.		0.438***		1.082***
		(0.114)		(0.233)
Down Imp. Exp.			-0.666	0.543
			(0.685)	(1.088)
Down Ex. Exp.			-0.047	-0.940***
			(0.142)	(0.249)
Observations	558	558	558	558

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Vote Share (with "y" as noted in column header) vs 2002 PT Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.

Table A.8: Impacts of China Trade Exposure on Support for PT (2022), Round 1

	(1)	(2)	(3)	(4)
	PT Rd. 1	PT Rd. 1	PT Rd. 1	PT Rd. 1
VARIABLES	2022 vs 2002	2022 vs 2002	2022 vs 2002	2022 vs 2002
Imp. Exp.	0.417*	0.935**	0.522	-0.275
	(0.229)	(0.379)	(0.400)	(0.432)
Up Imp. Exp.		-1.328**		-3.467***
		(0.553)		(1.006)
Ex. Exp.	-0.104**	-0.019	-0.097**	0.046
	(0.049)	(0.051)	(0.045)	(0.061)
Up Ex. Exp.		0.296***		0.865***
		(0.080)		(0.157)
Down Imp. Exp.			-0.076	3.611***
			(0.518)	(1.133)
Down Ex. Exp.			-0.046	-0.844***
			(0.089)	(0.148)
Observations	558	558	558	558

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: All specifications are two-stage least squares, with exposure measures instrumented for using rest-of-world parallels. Unit of observation is the microregion. Outcome in each column is difference in year "y" PT Round 1 Vote Share (with "y" as noted in column header) vs 2002 PT Round 1 Vote Share. Census controls are agri. worker share, manu. worker share, non-traded industry share, race shares, higher ed. share, average income, and total workforce count by microregion, all from the year 2000. Standard errors are clustered at the **meso**region level.