Capital on Capitol Hill: Personal Finances and Preferential Trade Agreements in the U.S.

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Abstract

Do legislators' investment portfolios explain their support of trade liberalization? I argue that legislators' personal, trade-related preferences influence their support of trade liberalization *and* that their investments reveal these preferences. Even if legislators do not naturally understand trade theory, I suggest they might learn about the effects of PTAs through firms' lobbying efforts. Analyzing roll call votes on preferential trade agreements (PTAs) enacted from 2004 to 2011, I find that members of Congress who own shares in firms that gain from PTAs are more likely to support them. I present evidence that owning firms that lobby informs this voting. By leveraging the two-member districts of the Senate, I show party-specific, geographic constituency differences do not explain these results. I revise and extend the prevailing explanation of PTA formation, provide fresh insight into the nature of lobbying, and open new avenues of inquiry into the role of money in politics, with implications for how we understand foreign (economic) policymaking.

1 Introduction

Why do policymakers support or oppose free trade? The literature has mostly focused on characteristics of a policymaker's constituency as determined by the dominant economic trade theories, most notably the Heckscher–Ohlin (HO) and Ricardo-Viner (RV) models (e.g. Hiscox 2002). Alternative approaches have focused on how special interest groups (e.g. Grossman and Helpman 1994; Baldwin and Magee 2000), institutions (Bailey, Gold-

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stein, and Weingast 1997; Mansfield, Milner, and Rosendorff 2002), and party politics (Milner and Tingley 2011) pull the policymaker away from the constituency towards firms' interests, the national interest, or the party's interests, respectively.

Yet, these theories cannot explain some important variation in behavior. For example, Democrats John Kerry and Ted Kennedy together represented Massachusetts in the Senate for 25 years. They were similar in sources of political action committee (PAC) contributions, age, gender, and ideology. Nothing in the literature predicts they would take different positions on preferential trade agreements (PTAs). Sometimes, though, they split their votes on PTA legislation, as they did in the 2006 vote on the PTA with Oman and the 2002 trade-promotion-authority vote, with Kerry voting for and Kennedy against.[1] At least some other individual characteristic—some factor beyond constituency, party, institutions, campaign contributions, gender, age, and ideology—likely matters for policymakers' support of free trade.

This paper argues that scholars need to pay more attention to policymakers' personal characteristics to understand their behavior. Kennedy and Kerry, in addition to the noted similarities, both were wealthy, yet only Kerry owned stock of firms that lobbied Congress on trade, while most of Kennedy's money was in index-tracking funds and a blind trust. I argue that, generally, the differences in legislators' investment portfolios reveal their trade-related preferences. Thus, positing a principal-agent relationship between legislators and their constituents, I anticipate that legislators whose investment portfolios stand to benefit from PTAs are more likely to support them, *ceteris paribus*.

I suggest a novel, informational role for lobbying whereby firms tell legislators how legislation relates to legislators' personal policy preferences—preferences distinct from reelection concerns. Legislators might not know how trade legislation impacts the firms they own, particularly given trade liberalization's heterogeneous effects (e.g. Melitz 2003). Lobbying could inform them. Informational theories of lobbying claim that special interest groups

[1] The United States-Oman PTA (H.R. 5684) passed, 63 to 32, and the Trade Act of 2002 (H.R. 3009) obtained cloture, 64 to 32.

inform politicians about a policy's impact on their constituents' or the nation's welfare, enabling them to take policy positions that improve their reelection chances (e.g. Grossman and Helpman 2001). I suggest lobbying could provide a different kind of information. Firms—compared to legislators—probably have a better understanding of how trade liberalization impacts their revenues. Thus firms might lobby to inform legislators of these effects. Legislators who own these firms should be particularly sympathetic to this information given their trade-related preferences.

In focusing on PTAs, I modify and extend the dominant theory of PTA formation (e.g. Mansfield, Milner, and Rosendorff 2002) in several ways. In addition to considering a new determinant of politicians' support for PTAs, I recognize that particular firms may heavily favor PTAs and that these firms tend to dominate lobbying, which fits well with recent scholarship and events. My theory allows that PTAs harm some legislators' constituents to the extent that a majority may oppose PTAs. This could mean that some legislators' trade-related preferences lead them to shirk in order to support PTAs, which contrasts with prevailing theories that argue governments forgo some national welfare benefits of trade liberalization when they enact protectionist policies in exchange for firms' campaign contributions (e.g. Grossman and Helpman 1994; Mansfield, Milner, and Rosendorff 2002).

I test my theory on PTA votes in the US Congress, focusing primarily on the Senate. I leverage unique features of the Senate to estimate the effect of legislators' trade-related preferences on PTA votes. I exploit the dual-member districts to compare how differences in financial self-interest explain divergences in PTA support for senators from the same state and same party voting on the same PTA, thereby completely controlling for party-, geographic constituency-, and specific PTA-level confounders, as well as interactions thereof. I exploit available data on lobbying to probe how firms' political activity seems to interact with legislators' trade-related preferences.

I find that legislators whose investment portfolios gain from PTAs tend to support PTAs. Ownership of firms that lobby—and not ownership of those that don't—predicts PTA

support. These results hold in both chambers across a variety of model specifications, though the House models do not control for possible confounders as completely. An interquartile range (IQR) shift in a legislators' informed financial self-interest increases the predicted probability of supporting an PTA by 15 percentage points in the Senate—equivalent to roughly 56% of the effect of switching parties.

2 From trade theory to preferences to policy

2.1 Theoretical approaches to PTAs from the Literature

A key insight of political economy is to use trade theory to infer the preferences of political actors. These preferences, in turn, can elucidate political outcomes of interest. This approach has helped explain the politics of trade and of numerous other issues, including national political cleavages, capital market integration, exchange rates, and immigration (e.g. Stolper and Samuelson 1941; Rogowski 1987; Frieden 1991, 2014; Peters 2015). While increasing our understanding of politics, this research has not considered the economic characteristics of the policymakers themselves.

Much of the literature has assumed electoral incentives account for legislators' behavior. Focusing on the literature on roll call votes on trade, scholars frequently look to trade theory to account for a key electoral consideration: constituents' preferences. Notable approaches include measuring industry-specific, district-level production (e.g. Hiscox 2002) or employment in exporting versus import-competing firms (Conconi, Facchini, and Zanardi 2014), building off of the RV model. Scholars also account for factor endowments emphasized by HO (e.g. Hiscox 2002; Milner and Tingley 2011).

These attempts to account for constituents' preferences might be problematic for two reasons. First, geographic constituencies are not the same as electoral constituencies (Fenno 1978). Legislators can ignore the interests of some voters and still be reelected. Legislators in the same district need not win over the same set of voters. For example, systemic differences

exist between the preferences of the electoral constituencies of senators from the same state but different parties. Attempting to measure their constituents' preferences at the state level elides this difference, leading to measurement error.

Second, this approach has yet to account for the insights of New New Trade Theory (NNTT). Scholars have long recognized much trade between countries takes place within industries (Krugman 1979). The prevailing explanation of this trend argues that, in industries characterized by substantial product differentiation, international market integration allows the most productive firms to increase their market share and exports to foreign markets while less productive firms lose market share and sometimes exit the market (Melitz 2003). To the best of my knowledge, studies of trade-related roll call votes have not inferred constituents' preferences using NNTT.[2]

This literature also highlights campaign contributions from special interest groups. One common approach anticipates corporate (labor union) PAC contributions encourage legislators to support (oppose) trade liberalization (e.g. Baldwin and Magee 2000; Conconi, Facchini, and Zanardi 2014), indicative of a HO model of trade where the abundant factor (capital, in the US) favors free trade, with the scarce factor (labor) opposing.

Other IPE scholarship, while not focused on legislators' behavior, models the government's objective function as consisting of concern for social welfare and desire for rents from firms, mirroring the roll call vote literature cited above. Grossman and Helpman (1994) (GH) argue that import-competing firms dominate campaign contributions and, reflecting an RV model, want protection. Voters presumably reward politicians who liberalize trade, as it increases the national welfare. Incorporating NNTT, Kim (2017) theorizes productive firms in differentiated industries—those likely to dominate lobbying (e.g. Kim and Osgood 2019)—will be pro-trade. These studies model the government as a unitary actor with a simple objective function and don't consider whether variation in legislators' characteristics matters.

[2]Recent work by political scientists *has* leveraged NNTT to understand the political activity of firms (e.g. Osgood 2016; Kim 2017).

Several other individual-level determinants of legislators' trade-related roll call votes crop up in the literature. Parties differ systematically in their support of trade: in the U.S. context, Republicans support free trade more than Democrats. Milner and Tingley (2011) find legislators tend to support PTAs when a member of their party is president. Imamverdiyeva, Pinto, and Shea (2017) explore the role of sex and show, perhaps counter-intuitively, that female legislators support free trade at higher rates. Several studies control for ideology and age (e.g. Conconi, Facchini, and Zanardi 2014). In this study, I account for all these individual-level factors and still find that legislators' economic characteristics predict important variation in support for free trade.

This paper focuses on a subset of trade legislation: PTAs. U.S. PTAs make a good case in part because, unlike most congressional legislation, they cannot be amended and face a simple up-down vote. This limits strategic voting, allowing a better measure of support of free trade. Though PTAs do more than liberalize trade, firms that gain from the deeper economic integration facilitated by PTAs are also distinguished by the firm characteristics NNTT highlights (e.g. Antras and Helpman 2004; Bernard, Jensen, and Schott 2009; Baccini, Dür, and Elsig 2018, 2018).

The dominant theory of PTA formation comes from Mansfield, Milner, and Rosendorff (2002) (MMR). Their modeling of legislators' objective function closely resembles that of GH: accounting for constituents' preferences and rents from (import-competing) firms sufficiently captures politicians' motives.

MMR and GH likely need modification (Baccini 2019). First, legislators' motives may be more than a combination of their constituents' preferences and the preferences of interest groups—here I argue their personal trade-related preferences matter. Second, as noted above, many firms—including those likely to dominate lobbying—favor free trade. Third, legislators may represent voters that oppose PTAs. Trade—including that resulting from PTAs—can cause geographically-concentrated harm (Autor, Dorn, and Hanson 2013; Hakobyan and McLaren 2016). Voters from these areas appear motivated to vote for anti-PTA policies and

legislators—scholars point to, *inter alia*, the election of Donald Trump, Brexit, and far-right support in Europe (Autor et al. 2016; Ballard-Rosa et al. 2017; Colantone and Stanig 2018; Ballard-Rosa, Jensen, and Scheve 2018). Many legislators behave as if voters will punish them for supporting PTAs. For example, legislators talk in a more protectionist manner when representing districts whose laborers face a high threat of off-shoring (Owen 2017). Legislators in districts impacted by the "China shock" tend to vote against trade liberalization (Feigenbaum and Hall 2015). As a general rule, legislators become less supportive of PTAs as elections draw near (Conconi, Facchini, and Zanardi 2014).

I focus on something entirely overlooked in the literature by exploring the impact of legislators' economic characteristics. In fact, the broader literature on legislative roll-call voting features few such studies (e.g. Welch and Peters 1983; Tahoun and Lent 2018; Peterson and Grose 2020). My use of dual-member districts in the Senate allows me to make a meaningful contribution to this literature, as all previous studies along these lines have relied on controlling for observable, geographic constituency-level variables which leaves concerns about omitted characteristics of constituencies biasing the results.

I also argue that any "trade theory-derived" interests over (trade) policy acribed to constituents or special interest groups can also be ascribed to legislators. The interests of constituents or special interest groups must pass through policymakers (Hiscox 2002). If policymakers have some agency, their interests—beyond reelection—can impact policy (Przeworski, Stokes, and Manin 1999). This claim runs against a large body of scholarship that holds reelection alone matters (e.g. Downs 1957; Mayhew 1974). Economic interests—whether they are best described by HO, RV, NNTT, etc.—should shape policy both indirectly—through the preferences of constituents and special interest groups—and directly—through legislators' personal preferences.

Using NNTT to infer legislators' preferences makes for a good test of my theory due to its firm-level predictions. Following an HO framework, most current members of Congress would gain from free trade as they tend to have significant capital investments; HO-based

preferences might not lead to many diverging predictions. RV may offer more fine-grained predictions, but for the past several decades the high level of intra-industry trade makes measuring whether a firm is exporting or import-competing difficult. Kim (2017) shows that, in its top 20 exporting industries, the US now *imports* as much as it *exports*. This means that, even armed with knowledge of the industry-level balance of trade, measuring whether the firms that legislators own are exporting or import-competing represents a serious challenge. On the other hand, there are good ways to measure the firm-level characteristics that NNTT suggests should determine whether firms export or compete against imports.

2.2 Why legislators support trade

My theory extends MMR and GH along several dimensions. First, I add another determinant of PTA support: legislators' trade-related preferences. I posit a principal-agent relationship between legislators and their electoral constituencies, arguing reelection *and* trade-related preferences motivate legislators. Second, my theory allows firms' preferences over PTAs to vary and firms can lobby accordingly. Finally, voters' may oppose or favor PTAs and vary in how much trade policy matters to them.

Why should legislators' portfolios correlate with their preferences over free trade? The literature that applies trade theory to determine actors' preferences tends to draw a straight line from economic gains and losses to preferences; voters and businesses are motivated by money. The parallel step here would be to assume that if a PTA benefits a legislator's "financial self-interest," personal financial considerations will increase the chances they will support the PTA. Let "financial self-interest" refer to the impact of trade policy on a legislator's personal finances.

This "self-dealing"—voting one's financial self-interest for personal enrichment—appears unethical and possibly illegal. Other factors could cause legislators' financial self-interest to reflect their trade-related preferences. First, life experiences and/or innate preferences that cause legislators to make certain investments may also lead them to prefer or oppose PTAs.

Reporting Individual's Name: Edward M. Kennedy

PART IIIA. PUBLICLY TRADED ASSETS AND UNEARNED INCOME SOURCES

Page Number 5

BLOCK A — Identity of Publicly Traded Assets And Unearned Income Sources

Report the complete name of each publicly traded asset held by you, your spouse, or your dependent child, *(See p.3, CONTENTS OF REPORTS Part B of Instructions)* for production of income or investment which:
(1) had a value exceeding $1,000 at the close of the reporting period; and/or
(2) generated over $200 in "unearned" income during the reporting period.
Include on this PART IIIA a complete identification of each public bond, mutual fund publicly traded partnership interest, excepted investment funds, bank accounts, excepted and qualified blind trusts, and publicly traded assets of a retirement plan.

BLOCK B — Valuation of Assets: At the close of reporting period. If None, or less than $1,001, Check the first column.

BLOCK C — Type and Amount of Income: If "None (or less than $201)" is Checked, no other entry is needed in Block C for that item. This includes income received or accrued to the benefit of the individual.

	Asset	None (or less than $1,001)	$1,001 - $15,000	$15,001 - $50,000	$50,001 - $100,000	$100,001 - $250,000	$250,001 - $500,000	$500,001 - $1,000,000	Over $1,000,000***	$1,000,001 - $5,000,000	$5,000,001 - $25,000,000	$25,000,001 - $50,000,000	Over $50,000,000	Dividends	Rent	Interest	Capital Gains	Excepted Investment Fund	Excepted Trust	Qualified Blind Trust	Other (Specify Type)	None (or less than $201)	$201 - $1,000	$1,001 - $2,500	$2,501 - $5,000	$5,001 - $15,000	$15,001 - $50,000	$50,001 - $100,000	$100,001 - $1,000,000	Over $1,000,000***	$1,000,001 - $5,000,000	Over $5,000,000	Actual Amount Required if "Other" Specified
Example: S, DC, or J	IBM Corp. (stock)				X																Example		X										Example
	(S) Keystone Fund					X										X		X			Example	X											Example
1	Edward M. Kennedy 1987 Blind Trust Dated September 23, 1987, LA, CA		X																	X		X											
2	Edward M. Kennedy 1997 Trust Funds invested include:																																
3	Fidelity Massachusetts Municipal Income Fund					X												X								X							
4	DWS Massachusetts Tax Free Fund CL S (formerly Scudder Mass Tax Free Fund)					X												X								X							
5	Dreyfus/Laurel FDS Inc. S&P 500 Index Fund						X											X								X							
6	Fidelity Commonwealth Trust Spartan 500 Index Fund						X											X								X							
7	Northern Trust US Government Money Market Funds			X														X					X										
8	End of Edward M. Kennedy 1997 Trust																																
9																																	
10	DFA Investment Dimensions Group Inc. Mutual Fund (IRA)			X														X						X									

"Bins"

S&P 500 Index-tracking fund

EXEMPTION TEST *(see instructions before marking box)*: If you omitted any asset because it meets the three-part test for exemption described in the instructions, please check box to the right. ☐

*** This category applies only if the asset is/was held independently by the spouse or dependent child. If the asset is/was either held by the filer or jointly held, use the other categories of value, as appropriate.

Figure 1: Page 5 of Kennedy's 2006 financial disclosure (OpenSecrets.org)

Second, legislators may use investments to signal their willingness to support policies that the firms they invest in prefer. In this case, it seems they likely expect something in return—perhaps a job after their political career—but maybe the reward is an intrinsic feeling of closeness to the business world. Below I return to question of why legislators' financial self-interest reflects their trade-related preferences.

Firms aim to maximize profits which are a key driver of stock prices (Haugen and Baker 1996). NNTT, backed by substantial empirics, leads to the conclusion that PTAs benefit a particular subset of firms. We have other evidence that these firms—productive firms in industries characterized by product differentiation—gain from PTAs. Many firms make statements that indicate they gain from PTAs. Firms' participation in committee hearings overwhelmingly signals that PTAs have a positive impact (Lee and Osgood 2019). While such firms may be providing an overly optimistic assessment of economy-wide effects, such signals indicate they support PTAs. P&G—in which Kerry owned shares in 2006—publicly tracked whether legislators supported PTAs (La Botz 2008). If profits drive firms' behavior—the standard assumption in the literature—firms vocally supporting PTAs most likely benefit from their passage.

Further, firms' lobbying behavior suggests PTAs impact their bottom line. Lobbying is costly; engagement in it indicates the expected value of lobbying—in terms of profits—justifies the expense. Additionally, event studies find that PTAs impact the valuation of stocks (e.g. Dür and Lechner 2018)—though these studies are likely to understate the impact since (political) events are often anticipated beforehand by a non-trivial set of investors, meaning stock prices reflect the value of the events before official announcements or press coverage (Bhattacharya et al. 2000; Borochin and Golec 2016). Thus, shareholders—including legislators—have a financial interest in the passage of PTAs. Such an incentive would be necessary if self-dealing motivates legislators, but would matter less for other possible drivers of the relationship between legislators' financial self-interest and trade-related preferences.

Given that NNTT offers a compelling test and appears to best describe the economy

Table 1: Top 10 firms in S&P 500 in 2006

Company	Labor prod.	Kerry's stake (est.)	Lobbied on trade	Amt. spent
Exxon Mobil	Top 1%	$42k	Yes	$15m
General Electric	Top 7%	$3m	Yes	$26m
Microsoft	Top 3%	$7m	Yes	$12m
Citigroup	Top 7%	$1m	Yes	$7m
Bank of America	Top 4%	$7k	No	$0m
Procter & Gamble	Top 7%	$12m	Yes	$3m
Wal-Mart	Top 42%	$0	Yes	$4m
Johnson & Johnson	Top 5%	$6m	Yes	$5m
Pfizer	Top 2%	$18k	Yes	$24m
AIG	Top 22%	$12m	Yes	$9m

[a] Source: Compustat, Open Secrets, LobbyView.

during the period under study, I use NNTT to measure legislators' financial self-interest. Specifically, owning productive firms in industries with high product differentiation should indicate that legislators favor PTAs. According to NNTT, more productive firms have an advantage in industries with high product differentiation—industries characterized by some level of market power perhaps due to consumers' brand loyalty or love of variety (Melitz and Trefler 2012). More productive firms, by definition, have greater physical efficiency—that is, they produce goods at lower marginal costs—and thus tend to be more capable of *both* profitably covering the additional costs of competing in export markets *and* surviving increased import competition when trade is liberalized (Melitz 2003).

On the other hand, legislators owning few or no firms impacted by PTAs should have weak, relatively anti-PTA preferences. Lastly, legislators with more capital in firms hurt by PTAs have strong, anti-PTA preferences, but such legislators are rare in the data. Note that an ideal test—one most likely to find results—would involve comparing legislators strongly opposed to PTAs to legislators with strong preferences in favor. The variation available, however, is between legislators with investments in firms not impacted by PTAs (or legislators without significant investments) and those that should strongly favor PTAs. This represents a more challenging test.

The complexity of the impact of free trade based on NNTT may lead us to question whether legislators know how PTAs correspond to their trade-related preferences. If self-

dealing drives these preferences, legislators may not know how PTAs affect the profitability of the firms they own. If legislators' portfolios reflect their pre-existing sympathies towards particular firms, they may not know these firms' interests in PTAs. If legislators invest in firms to signal their sympathy to firms, they may not be aware of what these firms want when it comes to PTAs. I expect, therefore, that simply owning firms that gain from PTAs might not increase legislators' support. They may also need information. There could be several sources of information and I focus on two: the lobbying efforts of firms and the career background of legislators.

Returning to the opening example, Kennedy owned between $250,00 and $500,000 in an S&P 500 index tracking fund (Figure 1). The firms that dominate this index tend to gain from PTAs. Table 1 shows the top 10 firms in 2006 and how they rank in terms of labor productivity relative to all firms then owned by politicians. Kerry owned stock in all of these firms except Wal-Mart. NNTT holds both Kennedy and Kerry owned firms predicted to gain from PTAs, albeit Kennedy indirectly. A key difference, though, is that Kennedy's index-tracking funds do not lobby. In 2006, Kennedy may not have understood that highly productive firms dominated his index fund (Table 1) and gain most from PTAs.[3]

Turning to the interaction between legislators and voters, I assume legislators are uncertain how much voters will penalize them for PTA roll call votes since voters care about other issues, too (Przeworski, Stokes, and Manin 1999). Voters want PTA policy near their ideal point which lies on a continuum, from maximally opposed to maximally in favor. Since PTAs offer diffuse benefits for consumers and diffuse costs for most labor, particularly in large economies, it will not necessarily influence most voters (e.g. Vavreck, Sides, and Tausanovitch 2019). In my theory, a legislator knows the distribution of PTA salience but not

[3]We may wonder if legislators know what they own. The likelihood they don't know probably increases as they own more stock—particularly if a broker manages their investments—someone like Kerry. Yet, Kerry almost certainly knows that he owns many large companies and, if he hears from several large companies that they support a PTA, he probably has some understanding that he owns some firms that want the PTA to pass. He need not be 100% certain of the firms he owns for my theory to work. We could also imagine that some legislators are more informed than others as to what they own. As long as some legislators have an idea what they own, the theory could still have explanatory power.

its realization. This assumption smooths legislators' objective functions, meaning electoral competition need not eliminate rent extraction from a legislator's optimum strategy (Persson and Tabellini 2016). This means rational legislators don't simply vote to maximize their reelection chances—even if the challenger offers voters their ideal PTA policy.

2.3 Equilibrium behavior and empirical implications

Firms choose whether to lobby, a costly activity. Since they seek to maximize profits, this action conveys information. Firms, if they have some chance to influence legislators, will be more likely to lobby as their expected gains or losses increase. Those unaffected have no reason to lobby. Firms may lack the wherewithal to lobby, especially those hurt by PTAs. NNTT says the firms most likely to be hurt by PTAs are smaller, less productive firms—firms found to lobby less (Kim 2017; Kim and Osgood 2019).

Legislators are lobbied and update their beliefs about how legislation relates to their trade-related preferences. If the firms they own lobbied in favor of or against of trade, legislators become more certain that they prefer or oppose PTAs due to personal preferences. If firms they own do not lobby on trade, legislators remain more uncertain and ambivalent. Legislators vote, considering their trade-related preferences, voters' PTA preferences, and the expected salience of PTAs. The salience is realized and voters choose the candidate they prefer, based on PTA policy and other factors.

Empirical implications: *1) the more a PTA aligns with a legislator's financial self-interest, the more the legislator supports the PTA*. This should hold if, as I argue, legislators' financial self-interest predicts their trade-related preferences. Their financial self-interest is measured according to their portfolios, particularly the firms they own stocks in.

I theorize legislators' portfolios provide information about both the direction *and* intensity of their trade-related preferences. For example, legislator A owns \$1000 in a highly productive firm involved in trade while B owns \$1000 in a highly unproductive firm involved in trade. A has more financial self-interest in supporting the PTA than B. If instead legisla-

tor B owns $1m in the same highly productive firm that A owns, A and B's preferences push them in the same direction, but B's preferences are more intense.

2) The effect of financial self-interest on PTA support depends on legislators' information about their trade-related preferences. Lobbying should convey this information, leading legislators to increasingly vote their trade-related preferences as measured by their financial self-interest. We can usefully compare this expectation to "uninformed" legislators who have not been lobbied and yet own firms that we expect to gain from PTAs. The effect of informed financial self-interest on PTA support should be larger than uninformed financial self-interest. We can also imagine other means of getting information about financial self-interest, such as pre-congressional career experience. Specifically, we would expect those with a background in business to have a better idea of how PTAs relate to their trade-related preferences than those without such a background.

This is a new argument about lobbying. Much of the literature on lobbying in general (Bombardini and Trebbi 2020) and over trade specifically (e.g. Grossman and Helpman 1994; Kim 2017) envisions lobbying as a *quid pro quo*. Legislators sell policy in exchange for rents. While my argument is similar in that legislators *might* enrich themselves when doing what benefits firms—and could harm constituents—it is also different. There is no direct transfer of anything but information—which accords with the view that lobbying is, unlike campaign contributions, conceptually distinct from an exchange of resources (De Figueiredo and Richter 2014).

Informational lobbying theories are not new, but the content of information in these theories stands in contrast to my theory. These theories posit lobbying influences sympathetic legislators who have similar preferences to the lobbying entity (e.g. Grossman and Helpman 2001). The sympathy, in this literature, emanates from the fact that the information can help legislators win reelection. Special interest groups inform legislators of how a policy impacts the nation or their constituents. The nature of information in my argument is starkly different: firms might tell legislators how a complex policy relates to the legis-

lators' personal preferences—preferences unrelated to reelection. The basic components of my argument echo earlier work focused on how political and economic elites pursue narrow policy goals over the interests of an unengaged public (Mills [1956] 2000; Schattschneider 1960; Olson 1965). These works do not, however, argue that lobbying informs political elites about how complex policies relate to their preferences.

3) Firms are more likely to lobby when legislators own them since lobbying is costly and legislators sympathize with firms' when the firms' interests and the legislators' financial self-interest align. The expected payoff of lobbying increases when legislators own the firm.[4]

3 Data and methods

3.1 Methods

A major concern when analyzing roll call votes is the many ways in which constituencies might matter due to economic characteristics, histories, preferences (that may or may not be driven by economic characteristics), etc. Further, adequately measuring these is daunting. Even in the context of IPE studies where trade theory can help infer constituents' preferences, knowing which specific trade theory to use and how to measure them is problematic. Trying to measure these factors at the electoral rather than geographic constituency further complicates the task. Even if we could know that we had accounted for these trade theory-derived preferences correctly, we cannot be sure we've accounted for other variables that matter.

[4]This is based on the assumption that firms are strategic—which seems relatively uncontroversial—and that firms have some idea whether legislators own them. There are at least two ways firms could learn who owns them. First, firms have comprehensive lists of shareholders. Comparing these lists to a list of national legislators would not be too burdensome for many corporations—particularly corporations considering whether to pay the large costs of a lobbying operation. Of course, there would be some uncertainty with this method. Second, legislators themselves annually disclose this information—which provides the data for this study. To the extent firms have the resources to review legislators' financial disclosures (something made easy given digitization of the data by groups like Open Secrets), they can know whether legislators own their stock. Of course, for my theory to have explanatory power, it need not be that all firms know whether legislators own their stock, but rather a portion of them.

Comparing legislators' roll call votes within the same district, party, and PTA—something possible in the Senate—sidesteps these issues. Since I want to show that applying trade theory to infer legislators' preferences teaches us something about trade politics, being able to account for legislators' party-specific, geographic constituency is crucial. This comparison accounts for not only all of the constituency-level confounders discussed in the preceding paragraph but also a legislators' party, the specific PTA, and interactions between all three. This approach, for example, can control for a scenario where Democrat senators from Michigan feel pressure from the Obama White House to support the Panama PTA even while many of their primary voters are particularly leery of foreign trade. Note that my approach probably underestimates the effect of trade-related preferences since it doesn't allow these preferences to influence the votes of senator pairs who voted together. In particular, most Republican senators pairs nearly always vote together in favor of PTAs. The GOP may draw legislators with pro-trade preferences because of its pro-trade stance. My approach is conservative, concluding that any such senators' support of PTAs is not driven by their trade-related preferences.

My analysis begins by looking at simple binary relationships between PTA support and financial self-interest within senator pairs. I next control for pre-treatment, individual-level confounders—nesting pairs of votes in hierarchical Bayesian models. I test if my results are robust to including potentially post-treatment variables—variables that may result in an underestimation of the effects. For example, if firms give campaign contributions to help keep these legislators in office, campaign contributions may flow to senators that are likely to support the trade-related policies firms prefer. This could be driven by the legislators' trade-related preferences. Even though these senators may be voting their trade-related preferences, including campaign contributions in the model might downwardly bias the estimates of interest.

I offer several other robustness checks, including testing my theory in the House. The large number of constituency-level controls that could be included in these models means

many possible models could be specified—particularly when one considers interaction and polynomial terms. For model selection, I use cross-validation to capture the data generating process as evidenced by goodness of fit and out-of-sample prediction (Gelman and Hill 2006; Gelman et al. 2013; Ward and Ahlquist 2018)—see Appendix A.1.

3.2 Data

I examine all PTAs voted on by the United States Congress from 2004 to 2011—Morocco, Australia, Central America (CAFTA), Oman, Bahrain,[5] Peru, Colombia, Panama, and South Korea. The United States Congress has constitutional authority—i.e. a veto (e.g. Krehbiel 1998)—over PTAs and it can deny the president the power to meaningfully negotiate (Bailey, Goldstein, and Weingast 1997). The public, structured nature of roll call votes provides a relatively clear measure of PTA support. There is intra-party variation—about 90% (33%) of Republicans (Democrats) support these PTAs.

As discussed above, I expect legislators' financial self-interest to reflect their trade-related preferences. I rely on NNTT to inform what firm characteristics make a firm likely to benefit from a PTA. I measure legislators' financial self-interest through their assets, focusing on their investments in firms. Legislators annually disclose their finances.[6] US legislators report, *inter alia*, earned and unearned income, assets, and liabilities. Table 2 has details on these and other data collected.

Legislators must report assets over $1000, indicating into which of 10 "bins" each asset falls (Figure 1). I take the midpoints of each bin to estimate the value.[7] Though legislators may disclose inaccurately, formal enforcement and potential punishment by voters limit this (Eggers and Hainmueller 2014). The standard deviation of total assets is $35m and roughly half report at least $1m.

[5]The Senate passed the Bahrain PTA by voice vote.

[6]Ethics in Government Act of 1978.

[7]The results hold when using the lower or upper bound. Approximately 11% of the time legislators reported exact values. Consistent with previous work using personal finance data (Eggers and Hainmueller 2014), using these exact values for imputation doesn't substantively alter results.

Table 2: Data collected, covering 2004 to 2014

Data	Original source	Variables	N
Personal finances	Center for Responsive Politics (Clerk of the House, Senate Office of Public Records)	name of asset (as reported by filer), asset value, asset type, type of income from asset, location of asset, industry of asset (CRP coding)	311,595
Firm financials	COMPUSTAT and Orbis (Bureau van Dijk); Imrohorouglu & Tuzel	net income, employees, cost of goods sold, equity, total assets, industry codes (NAICS), capital expenditure, property, plant, and equipment; total factor productivity	314,778 and over 365 million; 29,213
Mutual fund details	CRSP	market capitalization of firms, the proportion of mutual fund portfolios firms comprise	over 224 million
Industry details	Broda & Weinstein; Census Bureau	product differentiation; US imports and exports by NAICS code	8,213
Lobbying	LobbyView	lobbying activity by year; lobbying activity by bill; amount spent on lobbying	56,064
Bills	voteview.com	roll call votes on preferential trade agreements (PTAs)	4,715
Campaign contributions	Federal Election Commission	labor PAC contributions, corporate PAC contributions	311,222 (labor), 1,068,672 (corporate)
Constituency characteristics	Foster-Molin and Social Explorer; Census Bureau	percent foreign-born in a district, percent recently arrived, percent Black, percent Hispanic, percent with high school ed., percent with bachelors degree, unemployment, median income, population; number of people employed in NAICS industries	33,077 (annual, county-level for some variables)
Other legislator characteristics	Foster-Molin and The Congressional Biographical Directory; voteview.com; Nelson & Stewart; Carnes	age, gender, race, Senate class; ideology scores (DW-NOMINATE), party; committee membership; pre-politics career/occupation	5,885

[a] Note: The primary dataset is a panel of legislator-votes with corresponding variables.

I measure a legislator's financial self-interest by weighting the value of each asset by the firm's productivity and its industry's product differentiation, then summing these weighted values. Labor productivity measures productivity, following Kim (2017).[8] The measure of differentiation—the inverse of the mean elasticity of substitution for Harmonized System 10-digit products with an associated NAICS 6-digit code (Broda and Weinstein 2006)[9]—removes firms that do not deal in internationally traded goods, including firms dealing in services. In Appendix A.5, I categorize assets simply according to whether the firm lobbied Congress on trade or not. Since we know virtually all firms lobbying on PTAs support them (Blanga-Gubbay, Conconi, and Parenti 2020), this measure can be thought of as an alternate measure of whether firms gain from a PTA or not, and this measure includes firms that trade in services. The downsides of this measure include that it does not correctly

[8]Using market capitalization, capital productivity, return on assets, return on equity, or total factor productivity (İmrohoroğlu and Tüzel 2014) produces similar results.

[9]Firms can have several NAICS codes. I first attempt to match that designated as primary. If this was a non-traded industry, I match any secondary or alternate codes available.

deal with firms that gain but do not lobby for unrelated reasons—for instance, they may be able to communicate their interest through other means, perhaps campaign contributions or because they are headquartered in the district of a powerful legislator. Still, replicating my analysis with this alternate measure supports my main findings.

Figure 2 shows the distribution of this variable for Senators in 2006. Constructing this measure requires matching the assets listed on a personal financial disclosure (PFD) to firms in the `Orbis` (`Bureau van Dijk`), `Compustat`, and/or `CRPS` business databases. This involved manually checking to deal with misspellings etc. by legislators. I match 96.6% (57.4%) of legislators' assets that `opensecrets.org` classifies as public (private) firms.[10] This asset-level missingness seldom means a legislator goes from owning significant capital to little.[11] For mutual funds, I multiply the portfolio proportion of listed shares held at the end of each year with corresponding firm-level data and sum, resulting in average measures of productivity and differentiation for the mutual fund. I impute missing values since diversification leads to less variation in differentiation and productivity compared to firms. Dropping mutual funds and/or private firms and repeating the analysis does not substantially change the results (see Appendix A.4).

I use a logarithmic-type of transformation of measures of financial self-interest since I expect a move from \$0 to \$1 million matters more than one from \$25`m` to \$26`m`. I then standardize these variables to have a mean of 0 and standard deviaiton of .5, which both helps with model convergence and interpretation (@ Gelman and Hill 2006). For a measure of "total assets," this means taking the log of any sum of assets greater than \$0 before standardizing—the "Unweighted" panel in Figure 2.

Productivity is measured as $\frac{\text{net income}}{\text{employees}}$ and differentiation follows the definition from Broda and Weinstein (2006). When I multiply the value of assets by their productivity and differentiation—before summing by legislator—it is possible to have negative values, since

[10] Data on public firms from Eggers and Hainmueller (2013), which I extended temporally and marginally improved the match rate, aided the effort.

[11] The main results hold when summing up senators' assets without weighting, which does not suffer this missingness.

firms' net income can be negative. Thus, I follow Gelman and Hill (2006) in transforming the data. For $x \leq -1$, I calculate $-\log(|x|)$, for $x \geq 1$, I take the log, and, for $-1 > x > 1$, I set $x = 0$. I then transform the mean the "Productivity, differentiation" panel of Figure 2. Senators' total "lobbied" assets are those that lobbied Congress on trade in 2006, while "Productivity, differentiation, lobbied" are the sums of the productivity-, differentiation-weighted values of stakes held in firms that lobbied (See Figure 2).

We might be concerned that these measurement choices, though theoretically defensible, could drive results. To alleviate these concerns, I first reiterate that the key comparisons that dominate the data are between senators with few or no investments—these legislators lead to the tall "spikes" in the right and bottom panels of Figure 2—and legislators owning firms that should gain—the data to the right of these spikes in the right and bottom panels of Figure 2. That is, the distinction between owning PTA-impacted investment or not is more crucial than the particulars of how we measure investments impacted by PTAs. Second, other ways of summarizing the data produce consistent findings (Appendix A.5). For example, simply classifying an asset as "productive" or "unproductive" based on the median value of productivity, summing, and then comparing the effect of owning "productive" versus "unproductive" firms finds that only the former predicts increased support of PTAs in senator pairs. Similar results obtain when doing this analysis for "lobbied" versus "unlobbied" assets and for "differentiated" versus "undifferentiated" assets. Creating a measure of the "pro-PTA" orrientation of legislators' portfolios—regardless of the value of their assets—also produces consistent findings (Appendix A.8.5).

Lobbyists' reports show if firms lobbied Congress on trade during a PTA vote, which I match with legislators' firms (Kim 2018). To measure lobbying, I sum the number of quarters a firm lobbied Capitol Hill on trade in the year and year after an PTA since lobbying reports often report lobbying for the previous year.[12] I consider politicians more informed when their firms lobby. By differentiating between lobbied and unlobbied financial self-interest before

[12]Measuring lobbying as a simple binary or weighted by dollars spent, and including or excluding the lagged year, all produce similar results.

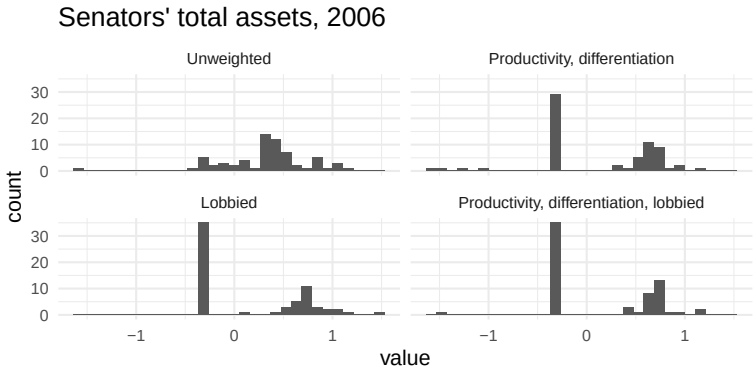

Figure 2: Histograms of measures of senators' financial self-interest.

summing a legislators' financial self-interest, I create measures of (un)informed financial self-interest. Note that the Lobby Disclosure Act does not require firms to indicate which members of the House or Senate they contacted, simply that they contacted at least one person in the chamber.

Is there anything to suggest that lobbyists' messages reach a significant number of legislators? The Foreign Agents Registration Act requires lobbyists representing foreign countries to disclose more information than firms have to, including precisely which government officials they contact. In these disclosures, we see that individual countries that lobby on PTAs contact hundreds of legislators when the final passage vote draws near (You 2020)—and the sums these countries spend lobbying are similar to the sums spent by firms in Table 1. Lobbyists sometimes organize events where they can interact with hundreds of legislators over the course of a few days (Birnbaum 2015, 22). We might think, further, that legislators can pass messages from lobbyists on to other legislators. While we cannot know that firms lobbying contact every legislator, we have evidence that they can contact many legislators, suggesting this measure captures whether legistlators might know firms' PTA preferences.

3.3 Measuring confounders

Potential confounders consist of personal, constituency, and PTA-specific characteristics. As mentioned above, in the Senate, my approach controls perfectly for the latter two categories,

but in the House—which I use as a second case and robustness check, I must attempt to measure and control for any potential confounders at these levels.

Personal characteristics include ideology, career background, and PAC contributions. Most of these are post-treatment, though the results change little with their inclusion. For ideology, I use DW-NOMINATE scores (Poole and Rosenthal 1985; Lewis et al. 2018). Since certain career backgrounds may dispose legislators to favor PTAs, I gather data on the proportion of legislators' pre-congressional careers spent in 3 broad categories—profit-oriented professions, service-oriented professions, and working-class jobs—as well as in 12 more granular categories (Carnes 2013). Following Conconi, Facchini, and Zanardi (2014), I measure campaign contributions as the log of the sum of contributions made to a legislator by labor union (corporate) PACs per two-year cycle. Like similar studies (Milner and Tingley 2011; Conconi, Facchini, and Zanardi 2014), I collected data on the margin of victory in the previous general election, age, party, copartisanship with the president, and gender.

Scholars have identified several constituency-level variables as important for trade votes (e.g. Milner and Tingley 2011; Conconi, Facchini, and Zanardi 2014), some of which were discussed above: high skill workers—the proportion of the populace over 25 with at least a bachelors degree, the foreign-born, black, and Hispanic proportion of the population;[13] median household income and unemployment; and the ratio of people employed in exporting industries over those employed in import-competing industries (*export ratio*). I include these in the House models. I also include PTA fixed effects in the House models to account for the differences between these bills, as well as an interaction between financial self-interest and the PTA fixed-effect to allow the estimated effect of financial self-interest to vary by PTA.

[13] I use the 2000 (2010) Census for votes before (following) 2010.

4 Results

4.1 Legislators support PTAs more when their investments gain from PTAs

I start with a simple comparison of support for PTAs and financial self-interest within same-party, same-state, same-PTA senator pairs. I code a "yea" vote as "1," a "nay" as "0," and any other vote (such as not voting) as missing. To get the measure of financial self-interest, I compare the productivity, differentiation weighted assets (e.g. top-right panel of Figure 2) of the senator pairs, and I code if a senator's financial self-interest as "1" if they have more productivity-, differentiation-weighted assets than the other senator in the state's delegation. That is, for senators from the same-party and same-state voting on the same PTA, I make a binary variable to capture which senator my theory predicts should be more likely to support the PTA. Take, for example, the two Democratic senators from Deleware in 2005. Tom Carper's measure of financial self-interest is 0.63 while Joe Biden's is -0.31—recall this variable has been transformed to have a mean of zero and standard deviation of .5. For this simple bivariate analysis, Tom Carper's financial self-interest will be denoted as "1" while Joe Biden's is "0," meaning that Tom Carper *stands to gain more from the PTA* than Joe Biden.

Figure 3 explores the bivariate relationship, offering encouraging evidence. The *first column* shows the relationship between all same-party, same-state, same-PTA observations for which *neither* member of the pair has missing values for these two variables (e.g., if one senator doesn't vote on an PTA, I remove the pair of votes). We see the average level of support for those who own less than their senate partner is 67%, compared to 79% for those that stand to gain more, a difference in means (DIM) of 12 percentage points. The rows show the breakdown of this relationship by party. We see this difference is large for Democrats—where support goes from 43% to 63%—and small for Republicans—who nearly all support PTAs.

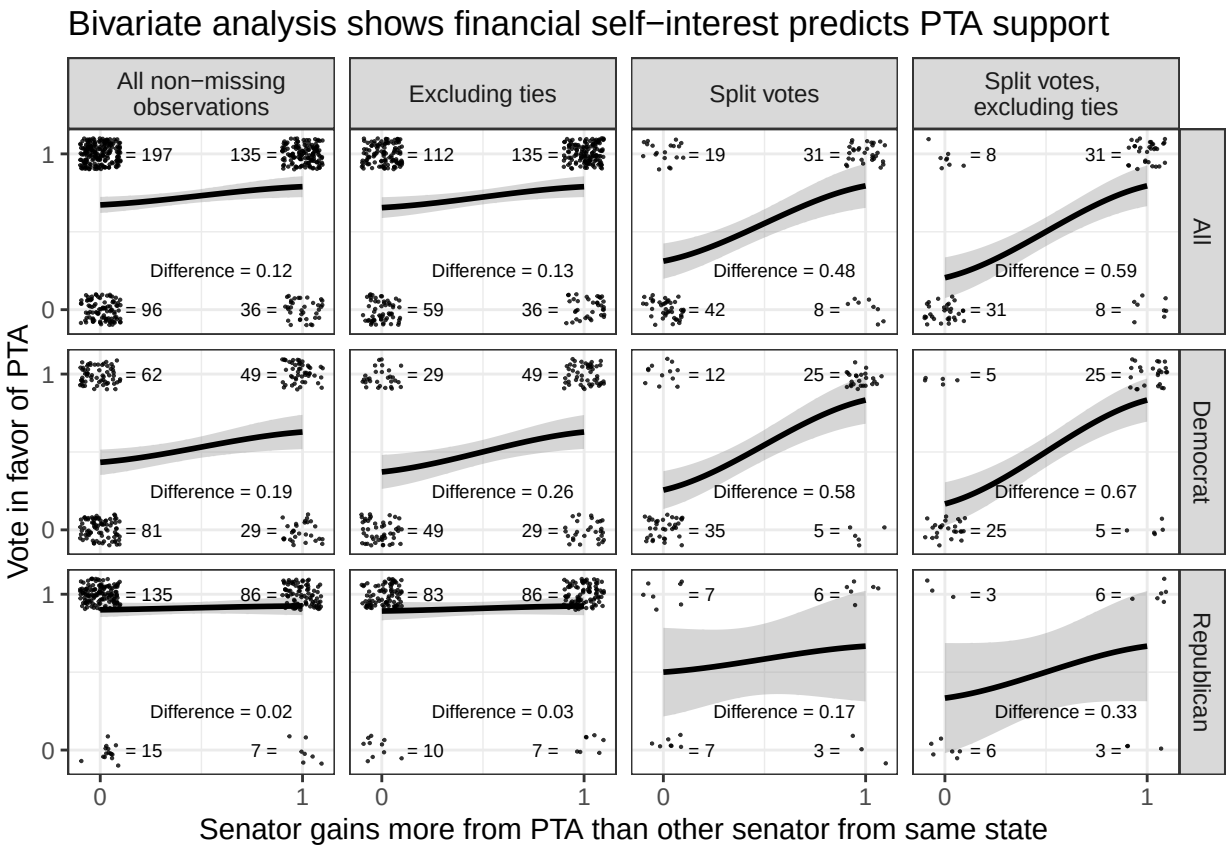

Figure 3: The bivariate relationship between PTA support and a binary measure of whether a senator stands to gain more from an PTA than the other member of their state's Senate delegation. The *rows* (*columns*) break down the relationships by party (subsample). The *first column* includes all complete pairs, the *second* excludes pairs with same value of financial self-interest ("ties"), the *third* includes *only* pairs that split votes, and the *forth* includes only split votes and non-ties. LOESS provides confidence intervals and smoothed lines

The quantities in column 1 of Figure 3 are the main focus of the main empirical implication of this paper. We can drill down into the data to understand better what drives the difference and, at the same time, set the scene for the models employed below. The *second column* in Figure 3 excludes "ties"—cases where both members of a state's Senate delegation have the same measurement of financial self-interest and thus financial self-interest cannot explain diverging behavior. This most frequently happens when neither senator invests in firms producing traded goods.

The *third column* of Figure 3 shows that split votes drive the overall DIM in the *first column*. Here I removed all senator pairs that did not split their votes. The design of this

bivariate relationship—and most models to follow—restricts the set of votes that financial self-interest might explain to only instances where senators from the same party and same state split their vote on an PTA. If party, state, and PTA factors—as well as interactions between them—explained senators' PTA votes, instead of the DIM of 48 percentage points we see in the *third column* of Figure 3 we would see no relationship. Note, too, that—in the rare instances that Republican senator pairs split their votes—the one that stands to gain less tends to oppose the PTA.

The *forth column* of Figure 3 removes senator pairs that have the same measure of financial self-interest from the set of senators that split their vote and we see the bivariate relationship strengthens further. In the analysis below, I construct models where the only observations that can drive an effect across all observations (as in the *first column* of Figure 3) are those where senator pairs split their votes and where the pair's financial self-interest differs.

More complex modeling is necessary for two reasons. First, while this bivariate analysis controls for constituency, party, and PTA factors, we should account for other individual-level variables. Second, while the binary measure of financial self-interest used has the benefit of simplicity, the expense is throwing out information. Theoretically, not only the fact of owning more than one's Senate partner but also the magnitude of the disparity should matter.

4.1.1 Financial self-interest continues to predict PTA support after controlling for individual-level confounders

I account for pre-treatment, individual-level confounders—sex and age—using Bayesian analysis. I fit a hierarchical, logistic model where each same-party, same-state, same-PTA pair of votes is placed in its own nest, which is analogous to adding a fixed effect for each of these pairs when using maximum likelihood estimation (MLE). I add an interaction between financial self-interest and each PTA, allowing the estimated effect of financial self-interest to

by PTA.

I choose Bayesian analysis instead of MLE for two reasons. First, MLE tends to overfit, leading to biased estimates (e.g. Ward and Ahlquist 2018), which Bayesian analysis addresses (Gelman et al. 2013). Second, with this particular data and modeling strategy, perfect separation commonly occurs, leading to unreliable estimates (Ward and Ahlquist 2018). Since there are many predictors relative to observations—including an intercept parameter for every same-party, same-state, same-PTA pair of votes—perfect separation is unsurprising. Bayesian analysis can provide valid estimates in this case (Gelman et al. 2008).[14]

I primarily choose weakly informative priors, ruling out unreasonably large estimates (be they positive or negative) (Gelman et al. 2008). Having standardized all the variables, summarizing priors is straightforward. For binary coefficients (PTA indicators, gender, business background, etc.), the priors are normal distributions with mean 0 and standard deviation of 2.5. For continuous variables—age and financial self-interest—the standard deviation is approximately 5 and increases to about 12.5 for the interaction terms (e.g. PTAs $\times$ financial self-interest).

These priors regularize estimates, penalizing the size of the effect of financial self-interest and protecting against overfitting—making a significant result less likely. I limit this regularization for the nests for pairs of votes. The purpose of these nests is to focus on financial self-interest's ability to explain diverging support for PTAs within these pairs of votes and regularization works against this. I discuss the details of these extremely uninformative priors over the senator pair intercepts in Appendix A.2.

To analyze the results, I focus on two quantities of interest (QOIs): predicted probabilities and the average expected effect of a first difference (AFD) (Ward and Ahlquist 2018). For a host of reasons, when calculating predicted probabilities, I focus on concrete examples.[15] Specifically, I choose two senators from the same state and party voting on the same

[14]In models where MLE does not result in perfect separation, the results are similar to those from Bayesian analysis.

[15]While some scholars construct counterfactuals using an "average" actor or observation—setting the values of all variables to their means and/or medians—I avoid this. A general problem with this approach is

PTA *that split their votes*. This mirrors the design of my overall analysis *and* highlights the type of votes that drive the overall effects I find. That is, this QOI tends to reflect the votes that were highlighted in the *fourth column* of Figure 3. Beyond the fact that I'm highlighting a senator pair that split its votes, the precise identities little—predicted probabilities for other vote splitting pairs would look similar. The choice of PTA on which the pair votes does matter. I attempt to choose a PTA where the effect of financial self-interest is neither extremely high or low. To provide a picture of the variation across PTAs, I use AFDs.

AFDs, beyond illustrating the variation of the size of the effect of financial self-interest across PTAs, crucially incorporate all observations in the data (akin to the *first column* of Figure 3)—not just vote splitters. Therefore, I find the AFD of an IQR shift in legislators' financial self-interest. Specifically, I first calculate the first difference for each observation given an IQR shift in financial self-interest and then calculate the mean. This minimizes extrapolation and incorporates all observations (Ward and Ahlquist 2018).

The left panel of Figure 4 shows the predicted probabilities for the votes of two Montana senators, Max Baucus and John Tester, on the Colombia PTA. Here, Baucus and Tester are chosen to illustrate how predictive financial self-interest is when senators split their votes. To calculate the predicted probabilities, I move financial self-interest from the lowest to the highest value in the data, stopping at 98 evenly spaced values in between, calculating a predicted probability at each. Highest posterior density intervals produce the 95% credible intervals shown. We see a strong, positive relationship between financial self-interest and PTA support. Moving from the minimum to maximum value of financial self-interest, the predictions for PTA support for both senators start at about 3% and rise to about 95%. Tester's observed financial self-interest (-0.31) has about a .2 probability of supporting the PTA—which he didn't. Baucus' observed financial self-interest (0.49) has about a .8 proba-

that setting all a model's variables' values to their central tendencies may result in a constructed observation that does not—and indeed cannot—exist (Gelman and Pardoe 2007). Using this constructed observation to then interpret the model involves unnecessary extrapolation and possibly misleading results, particularly when a model—for example, logistic regression—is non-linear (Chang, Gelman, and Pagano 1982). Most models in this paper include random intercepts for same-party, same-state, same-PTA pairs of votes. A meaningful central tendency for these does not exist.

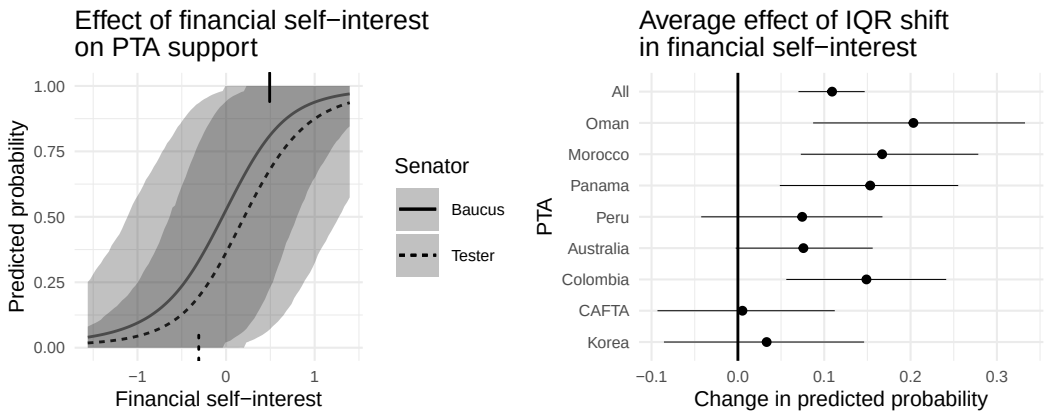

Figure 4: Support for PTAs increases with financial self-interest. 95% credible intervals based on 4000 draws from the posterior distribution. *Left panel:* Predicted probabilities for Max Baucus and John Tester supporting the Colombia PTA (H.R. 3078, 112th). Tick marks show observed financial self-interest and vote outcomes, with support (opposition) on the ceiling (floor). *Right panel:* The AFD of an IQR shift financial self-interest.

bility of supporting the PTA—which he did.

The right panel of Figure 4 shows the average first difference (AFD) of an IQR shift in financial self-interest. The estimated effect is about 11 percentage points—about 15% of the average level of support (72%). This result, accounting for the fact that pair nests preclude financial self-interest from mattering when senators vote together, is sizeable.

The right panel of Figure 4 also shows the AFD of an IQR shift in financial self-interest across PTAs. Oman, Morocco, Panama, and Colombia have the largest estimates, and CAFTA and Korea the smallest. The effect size decreases as a gravity model estimate of the size of the trading partner increases—which may suggest that, as the size of a trade deal increases, senators' concerns about salience dominate their trade-related preferences.These results suggest increases in financial self-interest increase PTA support.

Later, when discussing substantive effects, I show that financial self-interest remains relatively unchanged when adding post-treatment, individual-level controls for factors like ideology and campaign contributions (Section 4.4). I also show that under different institutional features and using a different modeling approach in the House, the AFD of an IQR shift in financial self-interest is about 4 percentage points (see Appendix A.3.1). As

noted before, the House models cannot account for constituency-level confounders as well as the Senate models do. The House models include post-treatment variables as I opt for predictive inference (e.g. Gelman et al. 2013). Nevertheless, the consistency of the results across chambers is encouraging and—as explored in Section 4.4—this cross-chamber consistency is essentially absent for other factors the literature has highlighted. The results in the House—as well as similar models in the Senate available on request—address concerns that the restricted sample of senator pairs drives the results.

4.2 Informed legislators follow their trade-related preferences

Are senators who own firms that lobby on trade more likely to vote their trade-related preferences? I replace the original measure of financial self-interest in the previous model with the measures of informed and uninformed financial self-interest, where owning firms that lobbied captures whether legislators might be informed. I add an interaction effect between these two measures of financial self-interest, as owning firms that have lobbied may also influence a legislators' beliefs about their trade-related preferences that their portfolios convey.

The PTA interactions now interact with all three of these financial self-interest terms, making the model fairly complex. Though the coefficient for informed financial self-interest is positive and large, that for uninformed financial self-interest is essentially 0, and the interaction term for these two variables is positive and large, all the interactions between these variables and PTAs makes understanding model implications by simply examining coefficients daunting—particularly given the non-linearity of the logit model.

Predicted probabilities can help. The top-left panel of Figure 5 displays predicted probabilities for Democrat, West Virginians Robert Byrd and John D. Rockerfeller IV (D-WV) voting on the Peru PTA. Again, these senators were chosen to illustrate the effect of financial self-interest when a Senate pair splits its votes. Rockerfeller has high levels of both informed financial self-interest (.80) and uninformed financial self-interest (.47). Recalling

the standarization of these variables, those are about 2 and 1 standard deviaitons above the mean, respectively. Byrd has informed financial self-interest of -.33 and uninformed financial self-interest of -.21.

Keeping these numbers in mind can help when examining the predicted probabilities in the top-left panel of Figure 5. As informed financial self-interest increases—and all other variables are left at observed levels—support for the PTA increases. That is, the model implies that senators strongly support PTAs as they own more firms that lobbied Capitol Hill. Indeed, for Rockefeller, the predicted probabilities trace out the sigmoid curve. The relative steepness of Rockefeller's curve is driven, in part, by the fact that he has higher-than-average uninformed financial self-interest *and* the interaction term between informed and uninformed financial self-interest has a large, positive coefficient.

This interaction term plays a more striking role when we produce predicted probabilities across the range of uninformed—or "unlobbied"—financial self-interest. For Byrd, who owns few firms that lobbied, the effect is negative. This result is also due to interaction effects specific to the Peru PTA. Rockefeller, on the other hand, owns many firms that lobbied and the interaction terms result in a positive relationship between uninformed financial self-interest and PTA support. When senators split their votes on the Peru PTA, the model implies that senators who own firms that should gain from PTAs *but* none of them lobby, these senators display lower levels of support for PTAs—like Byrd. When a senator—like Rockerfeller—owns some firms that lobby as well as some that do not, however, the interaction of owning both leads to a positive effect for uninformed financial self-interest.

While predicted probabilities help, the result also highlights the importance of the AFD in exploring model implications. For instance, we would like to know whether the negative effect—e.g. Byrd—or the positive effect—e.g. Rockefeller—dominates the Peru PTA votes and how the Peru PTA compares to other PTAs. The AFDs of an IQR shift are shown in the top-right panel of Figure 5, with an overall effect of 15 percentage points for informed

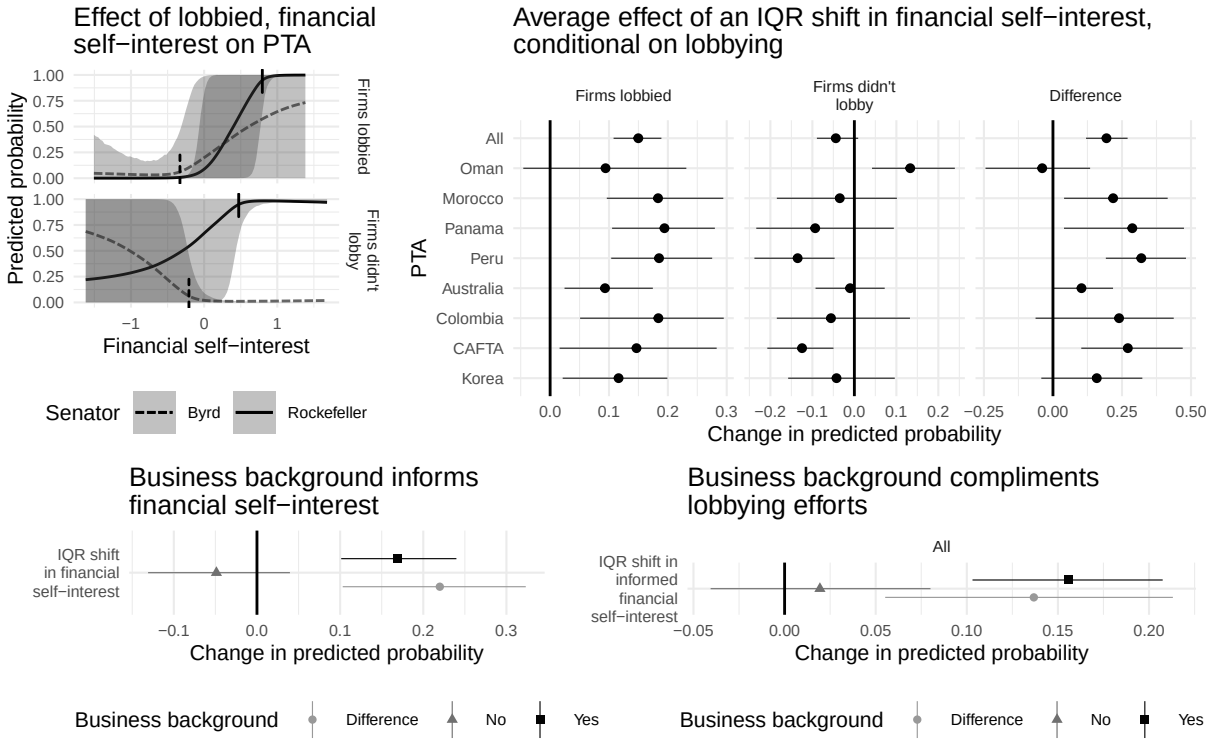

Figure 5: PTA support increases with informed financial self-interest. 95% Bayesian high density credible intervals based on 4000 posterior draws. *Top-left panel:* Predicted probabilities for Robert Byrd and John D. Rockefeller IV (D-WV) supporting the the Peru PTA (H.R. 3688, 110th). *Top-right panel:* AFDs for IQR shifts in informed and uninformed financial self-interest, and their differences. *Bottom-left panel:* The AFD of an IQR shift in financial self-interest, conditional on prior career. *Bottom-right panel:* The AFD of an IQR shift in financial self-interest when the owned firms lobby, conditional on prior career.

financial self-interest.[16] We see the AFD for uninformed financial self-interest is estimated at -5 percentage points—the credible intervals contain zero. The difference between the informed and uninformed AFDs is about 20 percentage points. Recalling Figure 4, note the PTA specific estimates for informed financial self-interest no longer obviously decrease as the trading partners' importance increases, while those for uninformed financial self-interest do. While speculative, it may be that lobbied legislators vote their trade-preferences regardless of salience.

Legislators could learn of their trade-related preferences in other ways, such as through their pre-congressional career. I code "business career" as the proportion of time spent as a business executive or "for-profit" professional—such as a lawyer (Carnes 2013).[17] Interacting business career with financial self-interest has the expected effect.[18] The bottom left panel of Figure 5 shows the AFD of an IQR shift in financial self-interest, conditional on having had a business career, is about 20 percentage points greater than the estimate for legislators with no business career.

We can further consider what happens if a previous business career and "lobbied" or informed financial self-interest interact. Legislators with a business background will be better positioned to understand the messaging of lobbyists, so I expect an interaction term between the two variables to result in a larger estimated effect of informed financial self-interest for those with a business background. The bottom-right panel of Figure 4 supports this, the difference in AFDs being about 13 percentage points.[19]

[16] Appendix A.3.2 shows similar results in the House. Simpler ways of measuring the role of lobbying produce consistent results (Appendix A.5).

[17] The results hold for using only one category or the other by itself.

[18] I use a Bayesian model like that used to make the top-right panel of 4, changing out the PTA term for the business background dummy. I use priors as discussed in Appendix A.2, except I choose a shape parameter of 20 and a scale parameter of 10 for the gamma distribution for the variance of the random intercepts to help with convergence.

[19] The model is like that described in the previous footnote, including the priors over the variance of the random intercepts.

4.3 Firms lobby more when legislators own them

The previous section presented evidence that lobbying informs legislators about the legislators' own trade-related preferences. If the mechanism is correct, we should be able to look at the situation from the perspective of firms and draw expectations about their lobbying decisions. Firms should tend to lobby more if their lobbying efforts have more chance of success. While perhaps not surprising, an empirical relationship between firm lobbying and legislator ownership should exist if legislators' investment portfolios reflect their trade-related preferences, firms are rational, and firms have information legislators lack about how PTAs relate to legislators' trade-related preferences.

I model firms' lobbying decisions as a function of whether legislators own the firm, including all publically listed firms involved in trade from 2004 to 2014. Following Kim (2017), I use a logistic regression of an annual binary indicator of lobbying on labor productivity, differentiation, number of employees, cost of goods sold, market value, capital expenditure, and investments in property, plants, and equipment. I include year and industry fixed effects (NAICS 2-digit).

I first add to this model a binary indicator for whether a member of Congress owned the firm or not. The top-left panel of Figure 6 shows firms owned by legislators lobby six times more frequently. The top-right panel of Figure 6 shows the effect of legislator ownership on firms' lobbying decisions increases as more legislators own the firm. Here I exchange the binary indicator of legislator ownership for a four-degree polynomial term of the number of legislators that owns the firm. We see a sharp increase to nearly 65% from a baseline of about 2% over the first 15 legislators that own a firm. The rate of increase decreases before picking up again at about 25 legislators. When about 40 legislators own a firm the predicted probability of lobbying nears 100%.

Does lobbying drive legislators' investments? There is evidence that ownership encourages lobbying. Lobbying's fixed costs burden smaller firms, as large firms can more easily pay these costs (Kim and Osgood 2019). Smaller firms should respond more to an increased

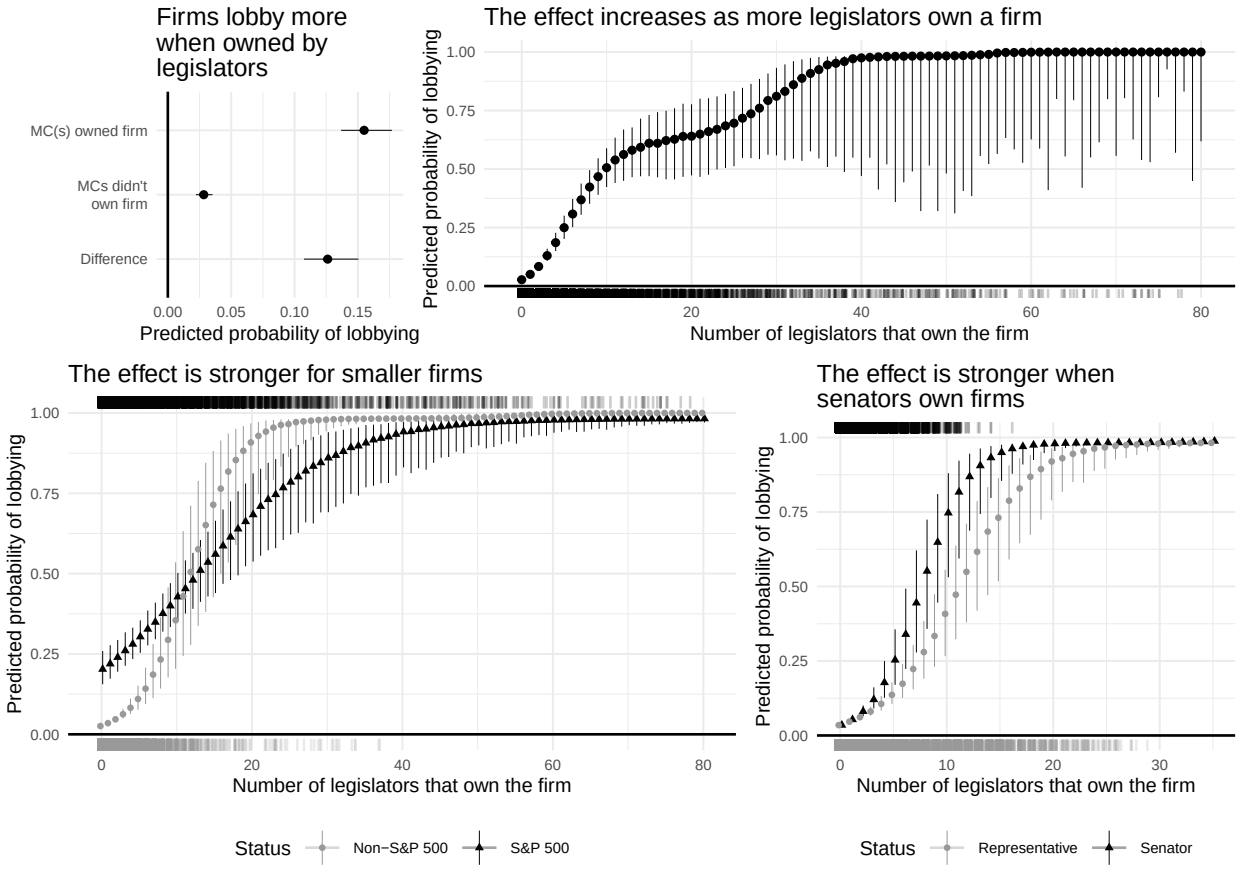

Figure 6: Firms lobby more when legislators own them. Quantities calculated across all observations. 95% confidence intervals produced by 1000 simulations with standard errors clustered by firm. I include all publically listed firms in industries involved in trade of goods from 2004 to 2014. *Top-left panel:* Predicted probabilities conditional on legislator ownership (binary), and their difference. *Top-right panel*: A four-degree polynomial term of the number of legislators owning a given firm produces the predicted probabilities as the number of legislators owning the firm increases (over 80 observations are scarce). *Bottom-left panel:* Predicted probabilities of lobbying conditional on membership in the S&P 500. *Bottom-right panel*: Predicted probabilities of lobbying conditional on ownership by chamber—opposite chamber ownership is set to 0.

chance of lobbying success—e.g. more legislator ownership. To test this, I exchange the four-degree polynomial for an interaction between S&P 500 membership and the number of legislators owning a firm. The bottom-left panel of Figure 6 shows the relationship between lobbying by small firms and legislator ownership is stronger. If lobbying drives firm ownership, legislators should not discriminate against bigger firms when investing.

Senator ownership should matter more to firms since there are fewer senators and they have more legislative independence. I remove the S&P 500 variable and separate the number of legislators that own a firm into senators and representatives, with an interaction between these. The impact of senator ownership exceeds that for representatives (the bottom-right panel of Figure 6). In Appendix A.6, I show restricting firms to those owned by representatives or senators—not both—confirms the results. Again, if lobbying drives legislators' firm ownership, this would be unexpected; there are more representatives than senators that can buy stock in a lobbying firm. Further, though senators tend to own more, the opposite is true when comparing senators to the top 100 House members. There are more representatives and they have more money, yet the relationship between lobbying and Senator ownership by senators is stronger. Different lobbying rates don't explain this; 3.60% (3.57%) of publically listed firms lobbied the House (Senate) on trade. This, too, suggests ownership by legislators encourages lobbying.

What if an omitted variable—not simultaneity—causes this relationship? There's evidence of a direct relationship between firms' lobbying and legislators' stock ownership. Nearly all firms that lobby one chamber lobby the other as well—consistent with the high startup costs of lobbying. Yet, 37 (26) times a firm lobbied only the House (Senate), involving 29 (18) unique firms. Compare this to firms lobbying both chambers 1,485 times of a total of 29,764 firm-year observations. Using the control variables from previous models, I fit a multinomial logit where the outcome variable is 1) a firm didn't lobby, 2) a firm lobbied only the House, 3) a firm lobbied only the Senate, or 4) a firm lobbied both chambers. The independent variables of interest are two binary indicators—whether at least one senator

and at least one representative owns the firm—and an interaction term. To avoid perfect separation, I use Bayesian analysis, choosing weakly informative priors (Gelman et al. 2008).

In spite of few observations, ownership by a chamber strongly predicts lobbying of only that chamber, as I show in Appendix A.7. Ownership by the House (Senate) makes a firm 4.8 (19.5) times more likely to lobby only the House (Senate) compared to when the firm is not owned by the House (Senate). Further, ownership by a particular chamber is a stronger predictor that a firm will lobby that chamber—and *not* the other—when compared with the effect of ownership by the other chamber.

If an unobserved firm characteristic caused lobbying and ownership without any causal connection between the two, we wouldn't expect this chamber-specific relationship; both chambers should be equally impacted. The simplest explanation of this finding is *either* that firms' lobbying causes legislators to invest *or* vice versa. Above I offered evidence that, to some degree, legislator ownership drives firm lobbying.

This argument needs more scrutiny than space allows. The point of exploring firms' behavior was to probe whether my theory about legislators' behavior—and particularly my argument about lobbying—is plausible. Though not definitive, the analysis aligns with expectations.

4.4 Substantive effects

The magnitude of the effect of financial self-interest compares favorably with other important variables. Here I focus in particular on lobbied or informed financial self-interest. I add to the model labor union and corporate PAC contributions and DW-NOMINATE scores—though they are likely post-treatment—to make the comparisons.[20] First, Figure 7 shows

[20] I use a model for the House described in Appendix A.1 and a Bayesian model for the Senate that includes informed financial self-interest, labor and corporate PAC contributions, and DW-NOMINATE scores, cross-nesting votes in same-party, same-state, same-PTA pairs, in parties, and in PTAs. Priors are described in Appendix A.2. I also include the pretreatment covariates age and gender. I calculate party AFDs by setting all observations' party to Republican and DW-NOMINATE scores to the Republican chamber median, calculating predicted probabilities. I subtract from these predicted probabilities the predicted probabilities that result from setting all observations to Democrat and giving them the Democratic median

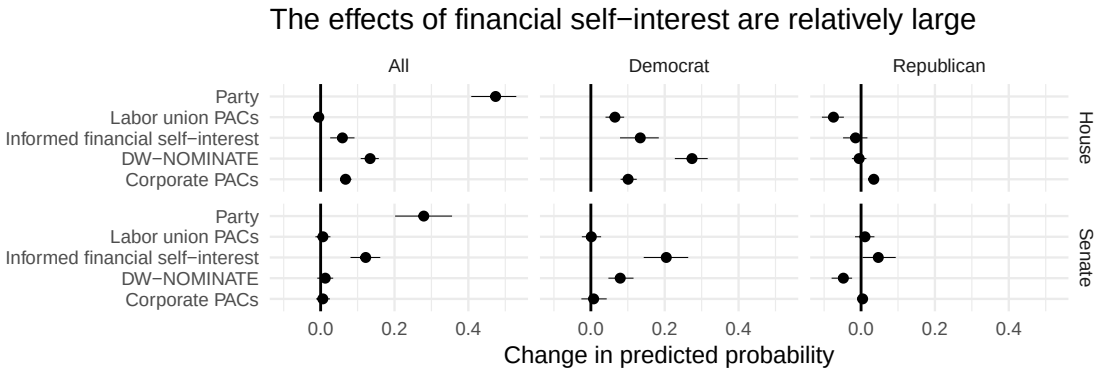

Figure 7: AFD of a within-party IQR shift in select variables. House (Senate) 95% confidence (credible) intervals based on 1000 simulations (4000 draws from the posterior distribution).

partisanship has an estimated effect in the House (Senate) of 47 (27) percentage points. The AFD of an IQR shift of informed financial self-interest of 7 (15) percentage points amounts to 15% (56%) of this (Figures 5).

Now I compare the variables' effects within parties since large changes in ideology effectively represent changing parties. Figure 7 shows AFDs of within-party IQR shifts for informed financial self-interest, PAC contributions, and DW-NOMINATE scores. In the House, DW-NOMINATE is largest overall and for Democrats. Informed financial self-interest and corporate PACs are about equal. Labor union contributions have large negative (positive) effects for Republicans (Democrats). In the Senate, the PAC contribution results disappear. That is, a major focus of the literature does not have a consistent effect across chambers. Informed financial self-interest's estimate exceeds DW-NOMINATE's in magnitude—for Democrats, it is more than twice the size—and generally exhibits consistency across chambers and parties. Given that the design of the Senate model is less subject to omitted variable bias, the relative size of the effect of informed financial self-interest—nearly half the effect of party and much larger than within-party ideology—attests to the substantive significance of legislators' economic characteristics in determining their support for PTAs.

DW-NOMINATE score for the appropriate chamber.

5 Alternate explanations and extensions

Could something other than legislators' "trade-related preferences" lead to these results? We might wonder if senator have different electoral constituencies—even when from the same party and state. For example, the legislator whose investment portfolio benefits from PTAs tends to rely on support from the business community. To explain why the correlation between investment portfolios and electoral constituencies exists, we could posit it has nothing to do with the preferences of the legislators but simply pre-existing connections due to a prior career that also happened to lead to certain investments. In this case, we would expect that when reelection is no longer a concern this pro-PTA behavior should decrease—certainly it shouldn't increase. That, however, is not what I find—in fact, senators that have announced retirement vote according to their (informed) financial self-interest even more strongly, as shown in Appendix A.9. We might wonder if this reflects revolving door incentives. In that case we are no longer talking about electoral incentives and different electoral constituencies. Financial self-interest—perhaps in the form of post-politics employment—would play a role. I leave exploring this to future study.

In Appendix A.8, I test whether this measure of financial self-interest explains other legislation—including the business-related issues of taxes and banking regulation—and find that it performs poorly. This attests to the measure's validity and trade specificity.

Returning to the question of why financial self-interest should reflect trade-related preferences, the trade specificity of this measure suggests that, if legislators—due to innate preferences or prior-personal experiences—hold pro-PTA preferences and investments that gain from PTAs, these preferences are not simply "pro-business." Perhaps it could be "por-internationalism."

I analyze within-senator behavior to test if innate or longstanding preferences drive the relationship between financial self-interest and trade-related preferences. Changes in financial self-interest shouldn't change senators' behavior if longstanding preferences drive the relationship. A severe lack of variation in the assets individual legislators hold across years

leads to imprecise estimates of financial self-interest, but the effects of informed financial-self interest and an interaction with retirement—variables that have more within-senator variation—resemble those above while falling short of conventional levels of significance (Appendix A.8.3). When I test whether owning a firm that lobbies on trade at the time of the vote increases support of PTAs more than ever having owned a firm that lobbied on trade—which should capture something more permanent like innate preferences—I find strong evidence that owning the asset at the time of the vote matters more (Appendix A.8.4).

Might legislators seek to faithfully represent voters, but investments in firms that lobby on trade inform investing politicians about the state of the world? This information could lead them to see PTAs as beneficial to their constituents. The retirement findings suggest, however, that they are somewhat unfaithful either before or after announcing retirement. Further, the lobbying results mean that even though lobbyists presumably try to inform everyone about the true state of the world, only those with stock in the companies absorb these messages. While we could incorporate this in a complicated theory, it seems unlikely that perfect representation explains the data adequately.

We might also worry that my measure is simply picking up some sort of wealth effect. In Appendix A.8.5, I replace my measure of financial self-interest with a measure of total assets, a measure of the "trade orientation" of legislators' portfolios, and an interaction between the two. The measure of "trade orientation" is based on the levels of product differentiation and productivity of the firms that legislators own, but *not* how much they have invested. That is, a legislator whose only asset is $1000 invested in a firm that gains heavily from PTAs will have a higher measure of "trade orientation" than one with $1m in firms that only benefit somewhat. While "trade orientation" and the total assets variables both have positive effects—suggesting *both* that legislators' trade-related preferences *and* overall wealth matter—the former is significantly larger *and* the interaction between these variables is larger still. The interaction term can be understood as a measure of the direction *and* intensity of legislators' trade-related preferences, a finding that bolsters my argument.

Definitively determining precisely why legislators' financial self-interest predicts their support of PTAs seems beyond this data. On the other hand, the evidence assembled strongly indicates that legislators' financial self-interests reflect their trade-related preferences, and the size of the effect of these preferences on PTA support is significant.

6 Conclusion

Recent scholarship on the pro-PTA preferences and lobbying efforts of firms (e.g. Kim 2017) and on the concentrated harmful effects of PTAs and the anti-PTA attitudes of localities thereby affected (e.g. Hakobyan and McLaren 2016; Colantone and Stanig 2018) encourages us to rethink our macro theories of PTA formation. Relaxing our assumptions about the preferences of voters, firms, and legislators over PTAs helps make sense of these findings. I argue that, while many voters may be relatively opposed to PTAs, firms and legislators that gain from PTAs support them. Firms lobby legislators on PTAs, sending a costly signal that PTAs benefit the firms. Due to preference alignment, legislators who own the firms prove sympathetic, voting for PTAs more frequently.

Evidence from Congress substantiates the theory. Owning firms that gain from trade predicts support of PTAs, with lobbying acting as a mechanism. Limiting the comparison to same-party, same-state senators rules out constituency and party explanations. In the Senate, retirement frees MCs to vote their financial self-interest even more strongly.

In addition to lobbying appearing to inform legislators how PTAs relate to their trade-related preferences, firms' lobbying behavior is consistent with my theory. Firms lobby more when legislators have invested in them. This amounts to a fresh theory of lobbying, where firms inform legislators how complex policy relates to the legislators' preferences.

My results suggest that scholars would benefit from more focus on policymakers themselves—including their preferences and investment portfolios. We should explore whether legislators' personal preferences influence other policy areas of interest: immigra-

tion, capital market integration, currency politics, etc. Going beyond economic policy, national security decisions—regarding military contracts, the use of force, etc.—have significant implications for the revenues of particular firms. Do legislators invested in affected firms behave differently than uninvested legislators?

Additionally, there is no reason to focus only on legislators; the executive branch, bureaucrats, domestic judiciaries, international tribunals, etc.—actors important in the international economy—could all be studied.

Though I've focused on an advanced democracy, the implications for states with weaker institutions and less electoral accountability are, if anything, more profound. The less control voters have, the more we might expect policymakers' personal preferences and investment portfolios to matter for policymaking.

We might also probe the downstream consequences of legislators favoring policy that aligns with the preferences of firms. Recent scholarship has studied whether trade, immigration, and/or economic integration broadly has contributed to anti-elitism in democracies around the globe. To the extent that voters perceive that policymakers favor international economic policies that help "big business," my findings might help explain the connections between anti-elitism and the international economy. For instance, even though the economic impact of the PTAs studied here is small compared to the US economy, some have featured heavily in US politics—consider president Trump's haranguing of the "terrible" trade deals his predecessors have made. Because international economic policy can easily play into "us-versus-them" narratives, they might play an outsized role in populist and nativist political movements.

Any broad conclusions, however, demand more study. I've examined PTAs in a single country at a particular time. Studying if these results replicate across issues, countries, vastly different institutions, and in other periods—with different international economic backgrounds—offer obvious extensions for future scholarship.

A Online appendix: additional tests, robustness checks

A.1 Crossvalidation for House models

I use information criteria and crossvalidation to select the statistical model I use when analyzing PTA votes in the House. There are a huge number of models I could attempt to run—particularly given all the potential constituency-level confounders in the House. In some models my variable of interest may be statistically and substantively significant. Selecting a model based on statistical significance may not be ideal. Instead, without looking at how my variable of interest performs, I test a lot of models that I think might explain the data well. By "explain the data well," I mean a model (1) does well at explaining the variation in the outcome for data on which the model was fit, (2) is not *needlessly* complex, and (3) is good at predicting out-of-sample observations on which the model was not trained (Friedman, Hastie, and Tibshirani 2001). As Ward and Alquist (2018, p. 84) write,

> If our favored model is no better than feasible and simpler alternatives at predicting new data then we have little reason to prefer that model, regardless of whether our theoretically-inspired specification has 'significant' coefficients for special covariates. If we have little reason to believe that the favored covariate is an important part of the underlying data-generating process then it makes little difference that its regression coefficient conforms to theoretical expectations in an overfit model.

The purpose of this section is to show, before looking at how the personal finances of legislators do or do not affect their support of free trade, that the model I am going to use to examine this question does the best job of capturing the data generating process. The results suggest that firm-centered inspired measures perform best, justifying their centrality in my argument.

I fit a logit model, with votes in support of an PTA coded as a 1, those against as 0, and excluding those that were not "yea" or "nay." I include all of the confounding variables discussed (Section 3.3). I test many different specifications of the model, including interactions of important variables (Gelman and Hill, 2006) and squared terms of variables where it seemed appropriate. I allowed several interactions of the variable of interest with DW-NOMINATE, party affiliation, vote fixed effects, and campaign contributions. I tested out others, but interaction terms of the variables just noted were the ones that usually improved model fit and out-of-sample prediction.

In an effort to adjudicate whether productivity and differentiation represented an improvement over Heckscher–Ohlin (H-O)—that is, does weighting an asset by productivity and differentiation improve model performance when compared to simply summing a legislator's assets—I used 5-fold cross validation and a large number of model specifications for different variables representing different theories. For H-O, I summed the legislator's assets. For new trade theory (NTT), which focuses on industries, I summed their differentiation-weighted assets. For NNTT, I weighted their assets with the different productivity measures and then summed. Finally, rather than assuming they must be mutually exclusive, I follow Melitz and Ottaviano (2008), weighting legislators' assets both by their differentiation and firm productivity, then summing. I fit dozens of models for each of these different measures, changing and removing interaction terms and including polynomial terms. I then selected the best performing models for each measure based on Akaike information criterion (AIC), Bayesian information criterion (BIC), and the logistic loss for the five-fold cross validation. AIC and BIC are calculated without five-fold cross validation. They both punish complexity, with BIC applying stricter penalties to additional terms than does AIC.

Having identified the best performing model for each measure, I then reran the five-fold cross validation, this time calculating additional measures of predictive power: accuracy, precision, F1, and the area under the receiver operating characteristic curve (AUC). These metrics are calculated on the out-of-sample portion of the five-fold cross validation for each

	Measure	AIC	BIC	AUC	Log_loss	Accuracy	F1	Precision
1	TFP-NTT	2635.340	3251.706	0.910	-0.393	0.846	0.888	0.875
2	Labor prod-NTT	2643.676	3241.551	0.910	-0.395	0.844	0.888	0.872
3	Size-NTT	2648.243	3246.117	0.910	-0.394	0.856	0.888	0.875
4	ROA-NTT	2653.738	3251.613	0.909	-0.396	0.845	0.889	0.873
5	Capital prod-NTT	2656.374	3254.248	0.910	-0.395	0.845	0.878	0.875
6	ROE-NTT	2656.374	3254.248	0.909	-0.397	0.845	0.879	0.875
7	NTT	2657.327	3255.202	0.909	-0.393	0.848	0.889	0.875
8	TFP (NNTT)	2662.573	3278.938	0.909	-0.395	0.844	0.878	0.876
9	H-O	2678.489	3288.691	0.907	-0.398	0.847	0.881	0.875

Figure 8: Model fit and predictive power for different measures of (productive and/or differentiated) capital.

iteration. The evidence points to the measures that combine the differentiation and productivity weights as being the best. New and new new trade theory ((N)NTT) best capture the data generating process. The goodness of fit and cross validation results are shown in Figure 8. For reference, the results of a model that includes only an intercept results in the following: an AIC of 4601, a BIC of 4607, a negative logistic loss of -.649, and an accuracy of .647.

Since I have multiple variables to measure productivity, I denote the different NNTT measures in Figure 8 by referring to the individual measures discussed above. "NTT" means the value of the asset was weighted by the product differentiation in that industry. Looking at Figure 8, if we think that modern trade theories should add something to classic theories, the AIC and BIC measurements of goodness of fit tell this story perfectly. Likewise, the AUC, which is perhaps the best single number summary of the out-of-sample predictive performance of a model, supports the same story. The H-O measure performs the worst in all these categories. If we look at only differentiation or productivity by themselves, they do better than H-O. Yet the best performers, no matter how we measure productivity, are those where, following (N)NTT, we combine productivity and differentiation in weighting capital.

The negative logistic loss and F1 measures are not dramatically different, but sometimes the models using just differentiation or productivity outperform some of those that combine

the two. The precision results do not differentiate much between the models, though the measures using labor productivity and ROA are laggards. The only metric where the H-O mechanism performs better than most is accuracy, where it is in the top three. It should be noted, however, that accuracy is a blunter measure of model performance than AUC or the negative logistic loss. In calculating a model's accuracy predictions are made based on a 50% predicted probability threshold and those that are wrong are penalized. That is, accuracy does not account for how confident or uncertain a prediction was (a guess of 51% and 99% are treated the same—either right or wrong).

This cross validation exercise provides evidence that weighting a legislator's capital holdings by the firm's productivity and its industry's product differentiation better captures the data generating process. Further, we can be confident that the implications for the measure of interest that come from this model are being derived from a model that performed well in terms of predicting observations it was not trained on.

A.2 Notes on priors over Senator-pair random intercepts in Bayesian models

The intercepts for each nest—each containing a same-party, same-state, same-PTA pair of votes—are modeled as a multivariate normal with mean 0 (Goodrich et al. 2020; Gelman et al. 2013). The covariance matrix for this multivariate normal density is decomposed into a correlation matrix and variances, with the variances being decomposed into the product of a simplex vector and the trace of the matrix. To get the trace, the square of a scale parameter is multiplied by the order of the matrix. The trace equals the sum of the variances. A large trace allows the parameter for each nest's intercept to easily take on relatively large values. I increase the trace by increasing the scale parameter, the prior over which is a gamma distribution. In the main specification, I set this gamma distribution's shape parameter to 50 and its scale parameter to 10 (the defaults are 1 and 1), resulting in a mean of 500. Increasing the scale parameter much more creates convergence problems. These priors create a high

expected sum of variances—$500^2 \times 243$, with 243 being the order of the covariance matrix (for other models I need to choose slightly more informative priors to ensure convergence, which I note in the paper when discussing these models). In terms of overall estimated effects, this choice matters little; financial self-interest is both good at predicting which pairs vote together and, when pairs split votes, which senator will vote in favor. This specification of priors, does, however, allow us to better estimate the effect across PTAs when we are interested in how financial self-interest explains within-pair divergences in behavior.

A.3 Main findings reproduced in the House

A.3.1 Financial self-interest increases PTA support

The main finding, that legislators should be more likely to support PTAs when their financial self-interest increases holds in the House. Using the cross-validated model (see Appendix A.1), I estimate predicted probabilities for Adam Schiff (D-CA) supporting the nine PTAs representatives voted on (see Figure 9, left panel). Using this model to estimate the AFD of an IQR shift in financial self-interest produces the right panel of Figure 9. The House confirms the main implication of the theory. The fact that the estimate of the overall effect (top estimate in the right panel of Figure 9; c.f. the top estimate in the right panel of Figure 4) is smaller than that for the Senate coheres with the idea that House members, facing reelection more often, are less influenced by their trade-related preferences.

A.3.2 Informed financial self-interest predicts PTA support

Legislators can only act according to their trade-related preferences if they know how policy relates to those preferences. As in the Senate, I find evidence of this in the House. Using firm lobbying as a mechanism by which legislators gain information, I show it is informed financial self-interest that predicts support of PTAs. Using the crossvalidated House model as the point of departure (Appendix A.1), I switch out the original financial self-interest measure for both the informed and uninformed measures.

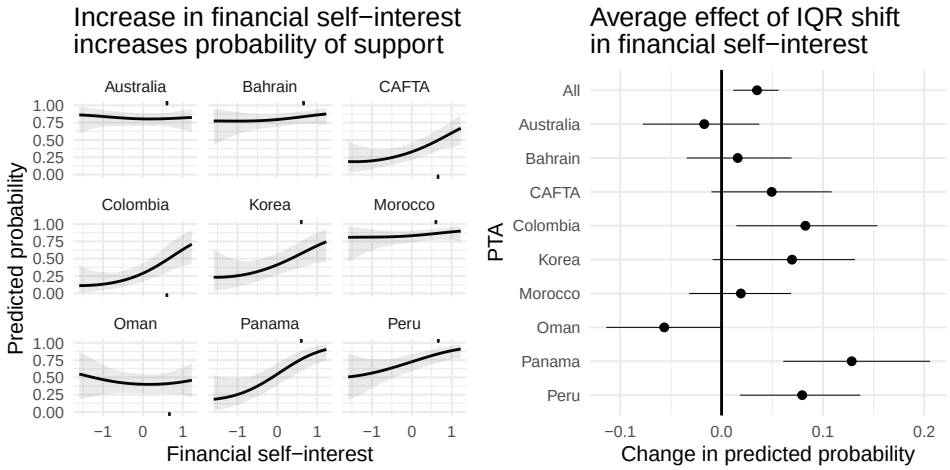

Figure 9: In the House, support for PTAs increases as financial self-interest increases. MLE produces point estimates and 1000 simulations produce 95% confidence intervals. *Left-panel:* predicted probabilities of Adam Schiff supporting PTAs across the range of financial self-interest. *Right-panel:* AFD of IQR shift in financial self-interest for all observations in the House.

I calculate predicted probabilities for Adam Schiff across the 9 PTAs considered by the House (see the left panel of Figure 10). When firms lobby, and thus Adam Schiff should be informed of his financial self-interest, increasing the measure of financial self-interest corresponds to higher predicted levels of PTA support. The corresponding effect for uninformed financial self-interest is absent.

The right panel of Figure 10 shows that this effect is not unique to the estimates for Schiff. While the AFD of and IQR shift in informed financial self-interest across all votes is large, about 7 percentage points, the corresponding effect for uninformed financial self-interest is not. The estimated difference between these two quantities is about 8 percentage points and attains conventional levels of statistical signficance.

A.4 Robust to dropping all classes of assets but public firms

Dropping anything that looks like a bank account, mutual funds, and private firms before creating the measure of financial self-interest for each legislator does not change the results of the analysis above (see Figure 11). Other combinations categories of assets do not change

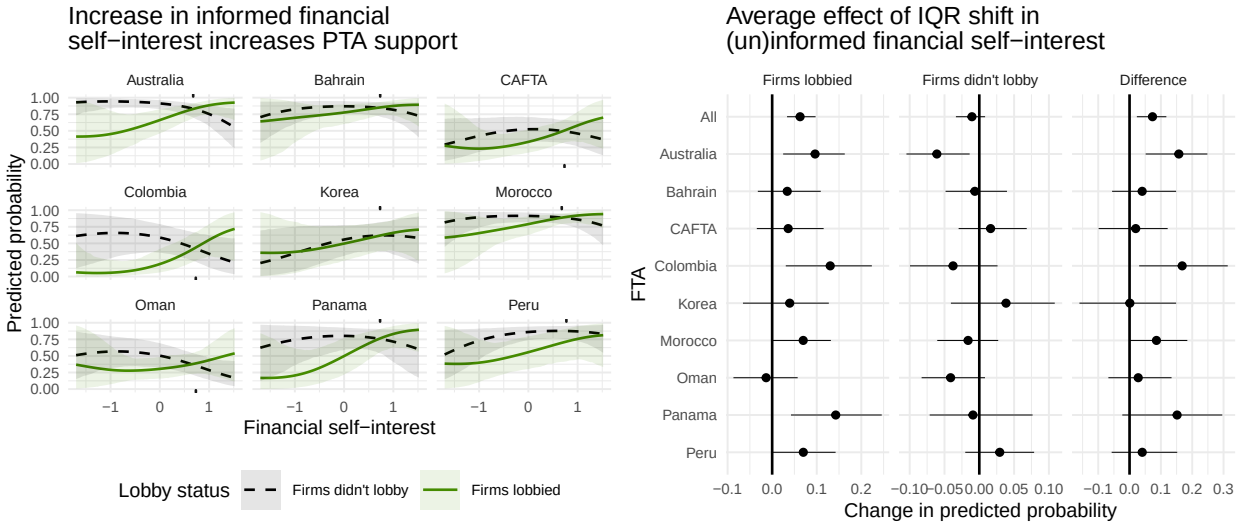

Figure 10: In the House, support for PTAs increases when legislators are informed. MLE produces point estimates. 1000 simulations produce 95% confidence intervals. *Left-panel:* predicted probabilities of Adam Schiff supporting PTAs across the range of financial self-interest, conditional on firm lobbying. *Right-panel:* AFD of IQR shift in financial self-interest for all observations in the House, conditional on firm lobbying.

these basic results as long as publicly listed firms are included (results available on request).

A.5 Robust to alternative operationalizations of financial self-interest

To show the relationship between financial self-interest and support of PTAs does not depend on the particular way I constructed the measure, I show similar results using different operationalizations. I first show that if I simply classify the firms politicians own as productive *and* part of industries involved in international trade, the effect of financial self-interest still holds. I classify a firm as productive if it its measure of labor productivity is greater than the median for firms in the data. I use the firm's NAICS code to determine if it produces internationally traded goods. Any firm that is above median labor-productivity and traded I classify as "productive." All others I label "unproductive." While clearly some of these "unproductive" firms may be productive but not traded, if they are not involved in trade NNTT does not predict they will have an interest in trade liberalizing policies. I then

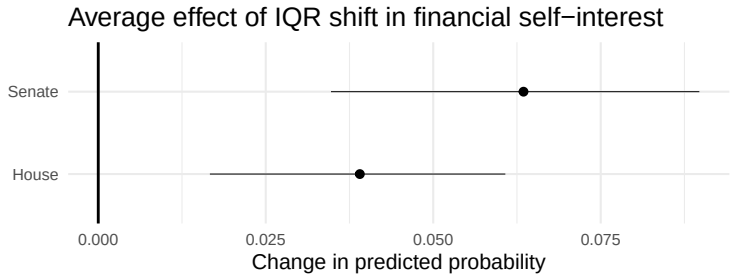

Figure 11: Support for PTAs increases as financial self-interest increases. These results do not change if we only use assets categorized as "public" firms by `OpenSecrets.org` to construct the measure of financial self-interest, dropping all else, including mutual funds and private firms. The cross validated model for the House and the same-state, same-party, same-vote fixed effects Senate model with pre-treatment covariates produce the estimates in this figure. MLE results in the point estimates of the effect of an AFD for an IQR shift in financial self-interest and 1000 simulations produce the 95% confidence intervals.

sum up all the value of a senators' shares in productive firms and in unproductive ones. I use a model like that in Figure 4, but with these changes: I use MLE—perfect separation does not happen in this model; I use same-party, same-state, same-PTA fixed effects instead of random intercepts; I substitute these "productive" and "unproductive" measures for my original financial self-interest measure. Figure 12 shows that the effect of this alternative measure of financial self-interest is large and significantly different from the unproductive firm measure.

I do a similar exercise for lobbying. I categorize whether each firm lobbied or not, and sum up the value of MCs' shares in firms that lobbied and those that didn't. I put them in the baseline model in place of the original financial self-interest measure. The estimate for financial self-interest, when lobbied, is large and significantly different from when firms didn't lobby, as shown in Figure 12.

I also do the same with differentiation. Like with productivity, firms in industries where differentiation is greater than the median observed and that make traded goods are labeled "differentiated" and those not are labeled "undifferentiated." Replacing the original measure of financial self-interest with these two measures, once again we see that the estimated effect for the measure my theory expects to matter for PTA support is much larger than the

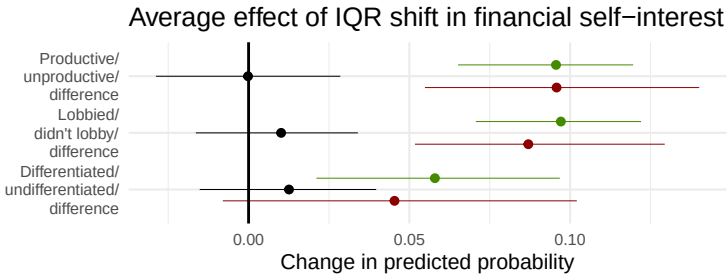

Figure 12: Support for PTAs increases as financial self-interest increases. These results do not change if we change the way we operationalize the variables. Instead of weighting, I simply bin assets according to 1) if the firms were above median productivity and produce traded goods or not, 2) whether the firms lobbied on trade, and 3) if the firms industries were above the median level of differentiation and they produce traded goods or not. I then estimate the effect of financial self-interest using the same-state, same-party, same-vote fixed effects Senate model with pre-treatment covariates. MLE results in the point estimates of the effect of an AFD for an IQR shift in financial self-interest and 1000 simulations produce the 95% confidence intervals.

complementary measure (Figure 12).

A.6 Senator's votes matter more on restricted sample

In the bottom-right panel of Figure 6, I show that the effect of a senator owning a firm matters more than a represenative for that firm's lobbying decision. Here I show this finding is robust to severely restricting the firms used to estimate this relationship. We may think, after all, that when a senator owns a firm this necessarily means many representatives already do, leading to a stronger relationship for the former even with the inclusion of an interaction term. Dropping all firms except those where only senators or representatives—or no legislators—own the firm produces the left panel of Figure 13. The pattern of a greater impact for senator ownership remains. Again, we may be concerned about extrapolation since no more than 4 senators own firms when no House member own the firm. Further resticting the sample to cases where less than 5 senators or House members own the firm produces the right panel of Figure 13. The result remains.

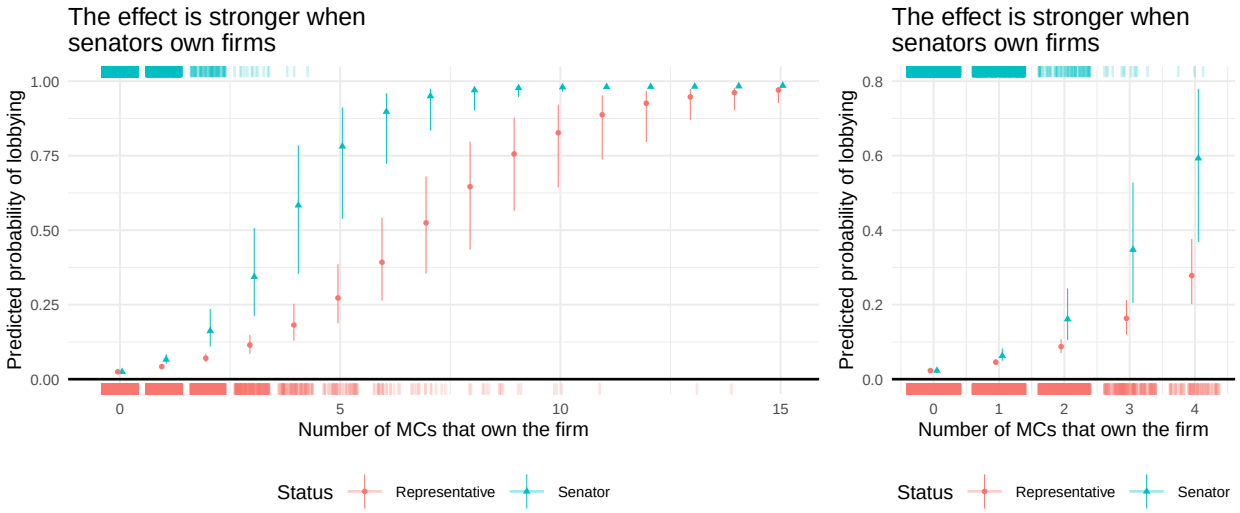

Figure 13: Firms lobby more when senators own them. *All panels:* Quantities are calculated across all observations on, with 95% confidence intervals from 1000 simulations and standard errors clustered by firm. *Left panel:* Predicted probabilities of lobbying as the number of MCs that own a firm increase, differentiating betwen senators and members of the House. Firms are restricted to those publically listed between 2004 to 2014 and where only members of the House or Senate (or neither) owned the firm. *Right panel*: Predicted probabilities of lobbying as the number of MCs that own a firm increase, differentiating betwen senators and members of the House. Firms are restricted to those publically listed between 2004 to 2014 and where only members of the House or Senate (or neither) owned the firm and where fewer than 5 MCs owned the firm. Note the y-axis range.

A.7 Ownership effect on lobbying appears chamber-specific

Here I show evidence that, in the rare cases when a firm lobbies only one chamber, whether they are owned by the House or Senate predicts their lobbying decisions. As noted in the paper, this happened only 37 (26) times in the House (Senate), involving 29 (18) unique firms, compared to a total of 29,764 firm-year observations where firms lobbied both chambers 1,485 times.

Using the same control variables as the firm-decision models in Section 4.3 in the paper, I use Bayesian estimation to fit a multinomial logit with a categorical outcome: 1) a firm didn't lobby, 2) a firm lobbied only the House, 3) a firm lobbied only the Senate, or 4) a firm lobbied both chambers. Two binary indicators—whether at least one senator and whether at least one representative owns the firm—and an interaction term are the independent variables of interest. I use weakly informative priors (Gelman et al. 2008). I standardize the control variables, to have mean 0 and the standard deviation 0.5 to help with model convergence.

Figure 14 shows a suite of average estimated effects. The first row is a simple AFD between whether a chamber owns a firm or not—that is, I set House (Senate) ownership to 1, calculated predicted probabilities of the outcome variable taking on each possible category, set the variable to 0, calculate predicted probabilities, and then find the average change in probability for each category. I display the results for whether a firm only lobbied the House—first column—or Senate—second column. The estimated effect of being owned by the House or Senate on lobbying a particular chamber is larger when the firm is owned by a member of that chamber.

Looking at the first row, it's clear that the absolute size of these effects is small—from .1 percentage points to .4 percentage points. When analyzing rare events, we should account for the incidence likelihood of the "control" group, and borrowing QOIs from the epidemiology literature can help (Ward and Ahlquist 2018). Figure 14, also shows the average relative risk, odds ratio, and log-odds ratio of the effect of being owned by the House or Senate on firms'

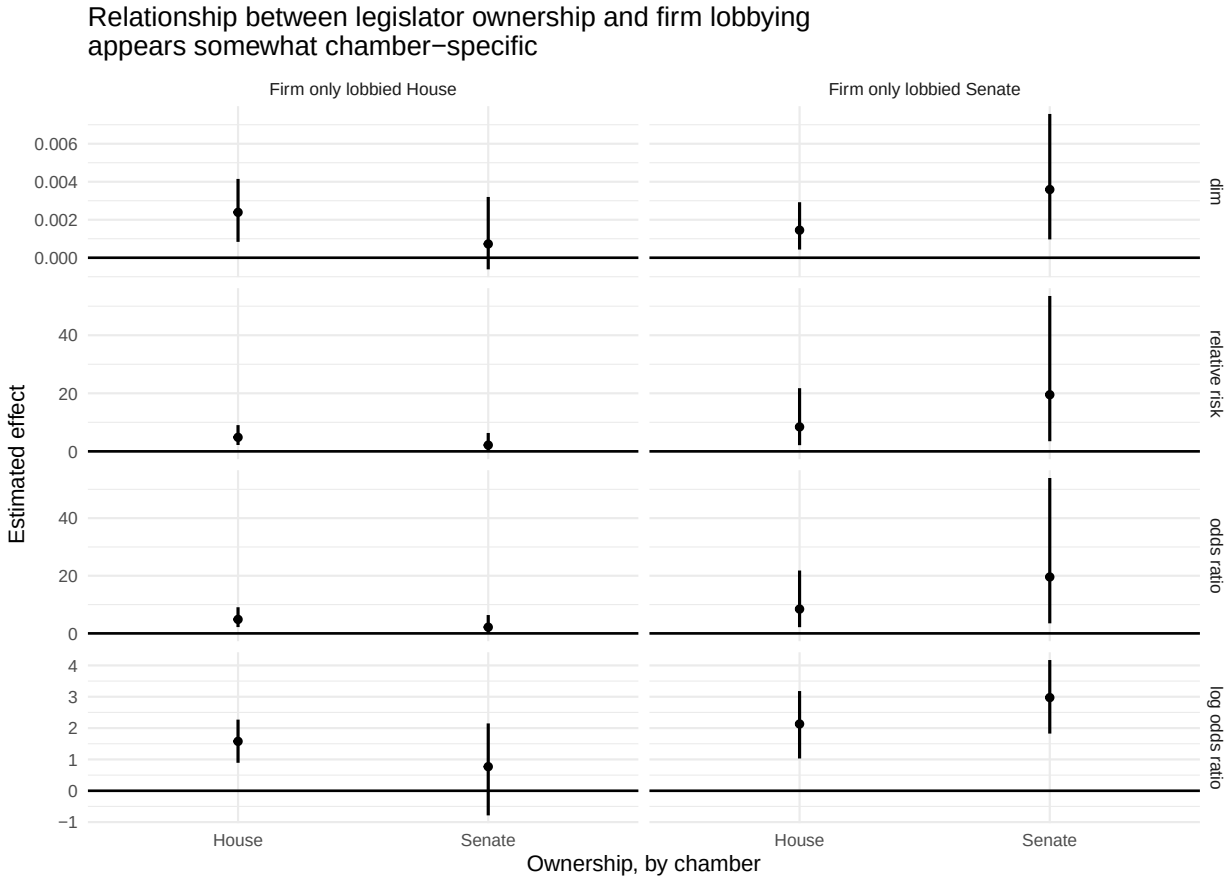

Figure 14: The effect of ownership by a chamber is first calculated by setting that chamber's ownership of a firm to 1 and then to 0 for all observations. The *first row* shows an AFD—a simple difference in means—between these two sets of probabilities. The *second row* shows the relative risk, dividing the predicted probability of a firm lobbying for the first counterfactual by the predicted probability of a firm lobbying for the second counterfactual. The *third row* shows the ratio of the odds—$\frac{p}{1-p}$—for the first counterfactual to the second counterfactual. The *forth row* shows the log of the odds ratio. 95% credible intervals based on 4000 posterior draws. Continuous variables are standardized to have mean 0 and standard deviation .5. Weakly informative priors are used: category intercepts priors are defined by a Cauchy distribution with mean 0 and standard deviation 10, while a normal distribution with mean 0 and standard deviation 2.5 defines the other priors.

decisions to lobby either one of those chambers. These all suggest the effects are substantial and there appears to be chamber-specificity to the ownership effects. For instance, looking at the relative risk, we see that being owned by the House (Senate) makes a firm about 5 times (20 times) more likely to lobby that chamber, compared to an increase of about 2 times (8 times) when owned by the opposite chamber.

Figure 15 displays the differences between the effects—shown in Figure 14—of being owned by the House and being owned by the Senate. We see that being owned by the House—compared to being owned by the Senate—is more predictive of lobbying the House, less predictive of lobbying the Senate, and the 95% credible intervals for the difference between these effects only just contains zero. For instance, while the relative risk of lobbying the House when owned by the House is 2.5 greater than the relative risk of lobbying the House when owned by the Senate, the relative risk of lobbying the Senate when owned by the House is 10.4 smaller than the relative risk of lobbying the Senate when owned by the senate. While both fall somewhat short of conventional statistical significance, the difference between these two differences in relative risk is large (13.2) and just shy of conventional levels of statistical significance. Recalling how rare these events are, the precision and size of these estimates offer strong evidence that the relationship between firms' decisions to lobby only one chamber is related to whether they are owned by that specific chamber. This is important because it rules out many potential omitted variables that we might be concerned drive legislators to own firms *and* drive firms to lobby—it is difficult to think of an unobserved factor that would cause these chamber-specific patterns.

A.8 Alternative explanations and measurment validity

Here I present evidence against alternative explations, try to parse why legislators' financial self-interest might reflect their trade-related preferences, and provide evidence of the validity of my measure of financial self-interest.

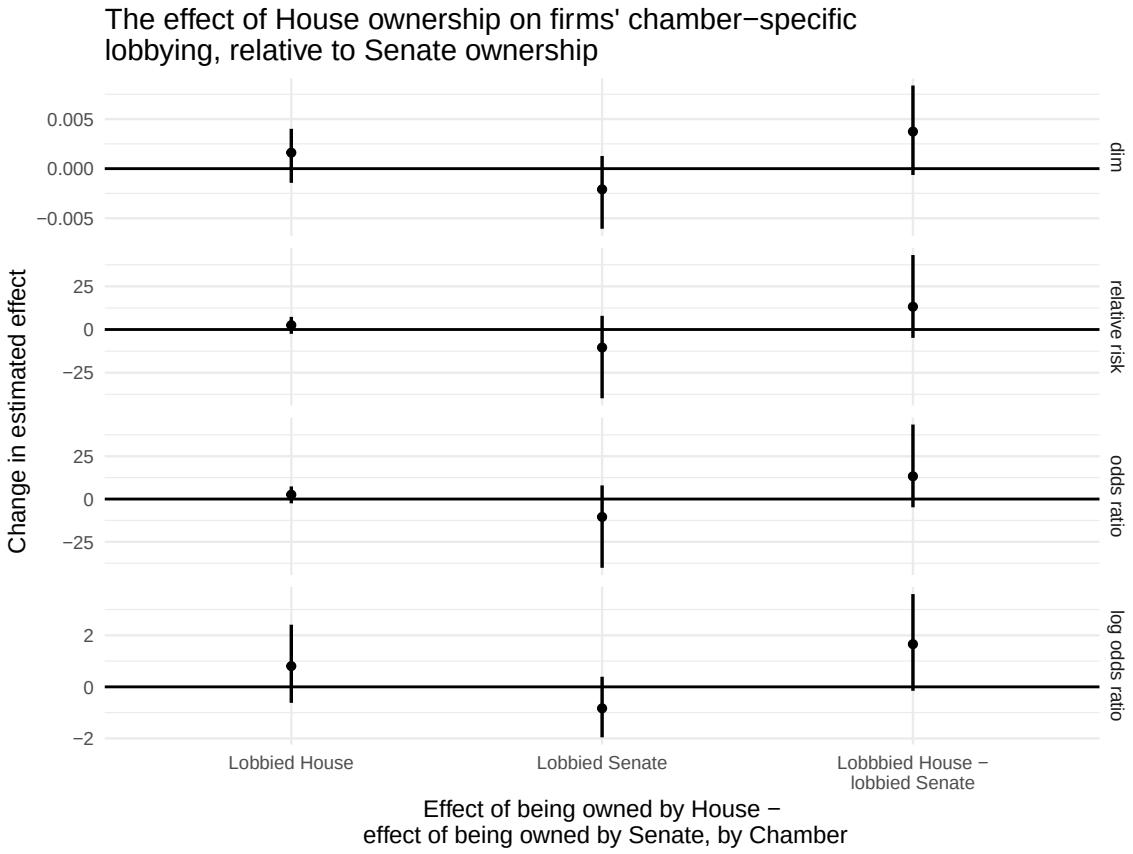

Figure 15: The differences in effect sizes for being owned by the House—based on setting House ownership to 1 compared to setting House ownership to 0—relative to being owned by the Senate—based on setting Senate ownership to 1 compared to setting Senate ownership to 0. The "Lobbied House - lobbied Senate" quantity is the estimated difference across chambers between these differences in effects. The *first row* shows these estimates for the difference in means or AFD. The *second, third,* and *fourth rows* show these estimates in terms of relative risk, odds ratio, and log odds ratio, respectively. 95% credible intervals based on 4000 posterior draws. Continuous variables are standardized to have mean 0 and standard deviation .5. Weakly informative priors are used: a Cauchy distribution with mean 0 and standard deviation 10 defines category-intercept priors, while a normal distribution with mean 0 and standard deviation 2.5 defines all other priors.

A.8.1 (Trade-specific) financial self-interest predicts PTA votes best

I download all final passage votes related to abortion, espionage/intelligence, financial regulation, and taxation (Issue codes "Abortion/Care of deformed newborns", "CIA/Spying/Intelligence", "Banking and Finance", and "Tax rates") happening the same years as the PTA votes (`voteview.com`). Coding votes in favor of restricting abortion, supporting espionage, against financial regulation, and against taxes as 1,[21] I fit the initial House and Senate models with the new outcome variables. The left panel of Figure 16 shows the AFDs of an IQR shift in financial self-interest bear out expectations (no "espionage" votes happened in the Senate). The signs of the point estimates for abortion and financial regulation switch across chambers and are not different from zero at conventional levels of significance. Espionage votes do not achieve conventional significance either. The estimate for tax legislation is consistent across chambers but doesn't quite reach conventional levels of significance. We might think, however, that many of the firms that would gain from trade would have an interest in tax policy, so we should perhaps not be too surprised by this result.

A.8.2 (Trade-specific,) informed financial self-interest predicts PTA votes best

I also argue that we should not see lobbying on trade operating in the same way for non-trade issues. To test this, I run similar models as those that produced the left-panel of Figure 16, exchangning financial self-interest for informed and uninformed financial self-interest. I focus on the issues that seem most related to financial self-interest—taxes and financial regulation. If the information being conveyed by firms lobbying on trade is working as I've theorized, this information should not impact non-trade-related legislation in the same way. The left panel of Figure 16 offers evidence that this is the case. The only non-PTA instance of there being an appreciable difference between informed and uninformed financial self-interest is in

[21] Though the models allow flexibility across bills, coding them all in a consistent direction allows coherent estimates when aggregating.

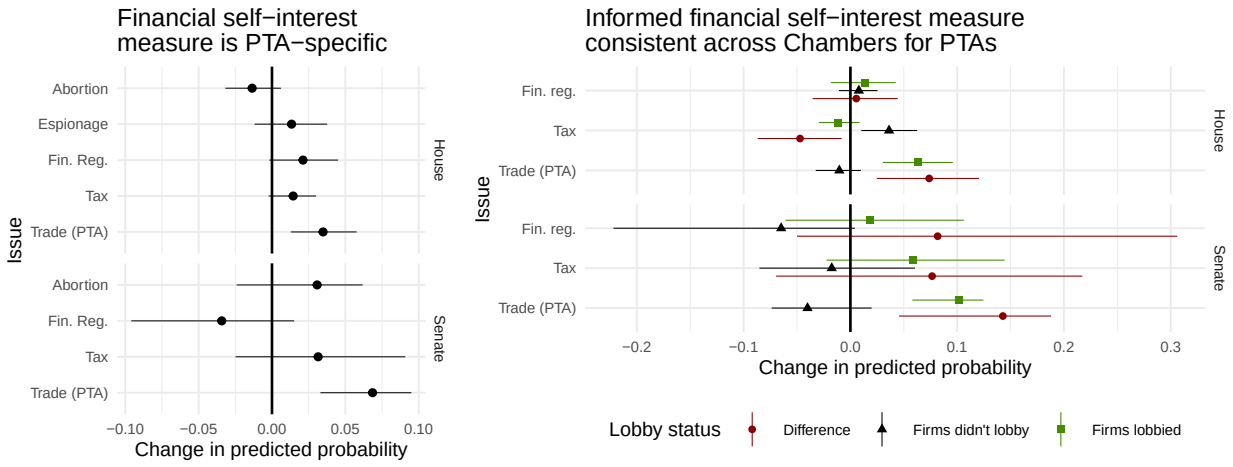

Figure 16: Evidence of the validity of the financial self-interest measure and the information from lobbying for PTAs. *Left panel:* House (Senate): AFD for an IQR shift in financial self interest across several issue areas during same years as votes on PTAs. 95% confidence (credible) intervals based on 1000 simulations (4000 draws from posterior distributions). *Right panel:* Same as left panel, except conditional on MCs being informed of their financial self-interest—measured by firm lobbying on trade. 95% credible intervals based on 4000 draws from the posterior.

the House for tax legislation, and the effect is in the opposite direction of what we find for PTAs.

The results in Figure 16 also suggest a broadly "pro-business type" of legislator is not a compelling alternate explanation. We would expect such a pro-business type to likely support weakening financial regulations and surely we would expect them to support lower taxes. Further, we would not anticipate the PTA-specific, lobbying-related findings.

A.8.3 Within-senator analysis largely supports results

I now offer suggestive evidence longstanding or innate "internationalism" preferences might not be driving the relationship between financial self-interest and PTA support. Analysis of the relationship between support of PTAs and financial self-interest within senators reveals that many of the findings above hold. For computational reasons, again I use Bayesian analysis. I include many individual-level variables discussed in the "Measuring confounders" section above: labor union and corporate PAC constributions, margin of victory in the

previous election, and copartisanship with the president. While most controls for constituents are relatively constant for individuals, I do include the ratio of a state's workers employed in import-competing versus exporting industries as this is during the period of the China shock and the proportions employed in these different types of industries may have changed significantly from 2004 to 2011. I control for the differences in effects between PTAs—in line with results above—by adding an interaction between the gravity model-based measure of PTA importance and financial self-interest. This choice—opposed to a PTA interaction term—makes model convergence easier.

I choose priors over the individual senator intercepts that reduce shrinkage of the individual senator intercept estimates. As in the Bayesian models to this point, for most terms in the model I use weakly informative priors. The intercepts for each senator-nest are the exception (see Appendix A.2). I again allow them to easily take on large values. I set the shape parameter of the gamma distribution controlling the variance of these intercepts to 20 and the scale parameter to 20.

It is important to note that there is little variance of financial self-interest within senators. Recalling that the financial self-interest variables were rescaled to have mean = 0 and standard deviation = .5, the means of the within-senator variance of financial self-interest, informed financial self-interest, and uninformed financial self-interest are .11, .09, and .17, respectively. There is no variation for the median senator on any of these measures and, at the third quartile, the standard deviation is .08, .06, and .33 respectively.

This lack of variation makes this a difficult test for finding an impact of financial self-interest on PTA support. Imprecise estimates are to be expected. Finding that the limited variation we see in within-senator financial self-interest predicts PTA support in ways consistent with the models above—where there was substantially more variation in financial self-interest to exploit—argues against an innate/longstanding preference explanation.

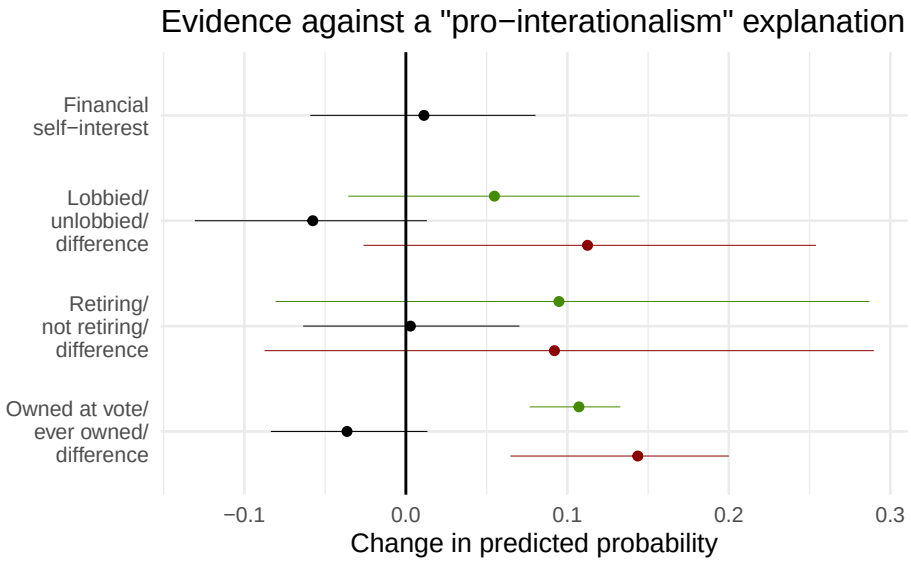

Figure 17: Results for the main findings in the paper largely hold when we restrict the analysis to within-senator behavior. Priors over the covariance matrix for the individual senator random intercepts are chosen to minimize "shrinkage," as was done in the senator-pair models. These are estimates of the AFD of an IQR shift in financial self-interest, with the y-axis showing what variable is being conditioned upon. 95% Bayesian highest density credible intervals from 4000 posterior draws. The fifth and final result compares the impact of owning at least one firm that lobbied on a PTA at the time of the vote with having ever owned a firm that lobbied on a PTA. The quantity estimated is the average change in predicted probability when setting each observation to "owning a firm that lobbied at the time of the vote" minus setting each observation to "ever having owned a firm that lobbied on trade." This model includes same-state, same-party, same-vote fixed effects and is estimated with MLE. 95% confidence intervals based on 1000 simulations.

A.8.4 Owning a lobbying firm at the time of the PTA vote is highly predictive of PTA support

The first 4 results in Figure 17 show the AFD of and IQR shift in financial self-interest. Though signed in the right direction, the estimate for financial self-interest is small and noisy. When we condition on whether firms lobbied, however, we see larger estimates and the difference between informed financial self-interest and uninformed financial of 11 percentage points almost reaches conventional statistical signficance. The estimates when conditioning on retirement are also in the right direction, though there is a considerable lack of power. The direction of all these within-senator estimates suggests that changes in financial self-interest explain changes in individual senators' voting behavior—something working against an innate/longstanding preference explanation.

I return to the same-state, same-party, same-vote design in another attempt to adjudicate between a self-dealing explanation and an innate/longstanding preference explanation. I create a simple binary variable for whether a senator owned a firm that lobbied on trade at the time of the vote and another that indicates if a senator ever owned a firm that ever lobbied on trade. The reasoning is that the first—owning a firm that lobbied at the time of the vote—should tap into financial self-interest, while the latter—ever owning a firm lobbying on trade—should tap into the more intransigent notion of type. Using MLE to estimate the model, I find that owning a firm that lobbied on trade at the time of the PTA vote is statistically and substantively more predictive of PTA support, shown in the last result in Figure 17.

A.8.5 Total assets' effect is small compared to that of the trade-orientation of a legislator's investment portfolio

I now show that the results are not driven simply by the role of total assets—which could be seen as a sort of "wealthy senator effect." It makes sense to examine this possibility since my measurement choice to weight the value of legislators' assets by their productivity and differ-

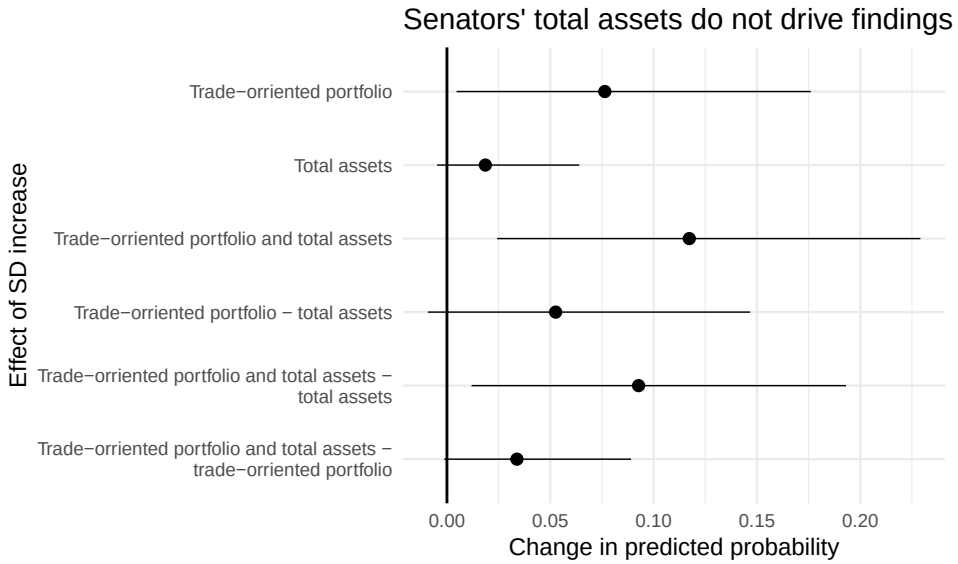

Figure 18: The estimated AFD of an increase in a standard deviation (+ .5) for given variables, as well as the sum—"Trade-oriented portfolio and total assets" increases both these variables by .5 and calculates the AFD relative to the status quo—as well as differences between these AFDs. 95% Bayesian highest density credible intervals from 4000 posterior draws.

entiation combines what might be considered a "total assets" or "wealth" effect—represented by the value of the asset—with the trade orientation of their portfolio—determined by the productivity and industry differentiation of the asset.

To test whether a senators' total assets drive the results, I create two new variables. The first is simply a measure of a senators' total assets—I sum the midpoint of the value of a senators' assets for each year. The second variable I create is a measure of how "trade-oriented" a senators' portfolio. For this, I multiply the productivity by the differentiation of each asset a senator owns. I then divide the result by the value-weighted proportion of the senator's portfolio that the asset comprises, and I sum the results by senator-year. Again, because I anticipate diminishing returns, I transform the variable to reduce skew and then standardize it to have mean 0 and standard deviation .5. I also include an interaction term between the "trade-orientation" of senators' portfolios and their total assets. I use Bayesian estimation to fit a logit model like that in Section 4.1.1 of the paper, exchanging the measure of financial self-interest for the three variables discussed in this paragraph.

If my theory is correct, I would expect that a more trade-oriented portfolio should increase a senators' probability of supporting PTAs. Further, to the extent that having more invested in firms that gain from trade reflects stronger trade-related preferences, the interaction term should be positive. And this is precisely what I find: the coefficient for the trade-oriented portfolio is 8.2, that for total assets is 3.1, and the interaction term is 12.8. The first two estimates are significant at the 95% level, while the interaction is nearly so.

To aid with interpretation, Figure 18 shows the AFD of a standard deviation increase in these variables (+ .5). The estimated effect for "trade-oriented portfolio" is 7.5 percentage points, while that for total assets is about 2, and the estimated difference between these of about 5 percentage points is just shy of conventional statistical significance. Further, the impact of the positive interaction effect can be seen in the estimated 12 percentage point effect of increasing both, which is larger than the effect of "trade-oriented portfolio" or total assets on their own. This aligns nicely with the argument that legislators' portfolios reflect *both* the direction *and* intensity of their trade-related preferences.

A.9 Retiring senators vote their financial self-interest more strongly

Here I present evidence that retiring legislators vote their financial self-interest more strongly than when they plan on running for reelection. I specifically focus on lobbied—or "informed"—financial self-interest, though similar results obtain for the measure of financial self-interest that doesn't account for lobbying (available on request) and the within-senator analysis also points in this direction (see Appendix A.8.3). I take the model from Section 4.1.1 in the paper and exchange the measure of financial self-interest for lobbied financial self-interest, a retirement indicator, and an interaction between these. The retirement indicator takes on a value of 1 if a legislator retires at the end of the Congress during which the Senate voted on the PTA.

I show the results in terms of predicted probabilities and the AFD of an IQR shift in

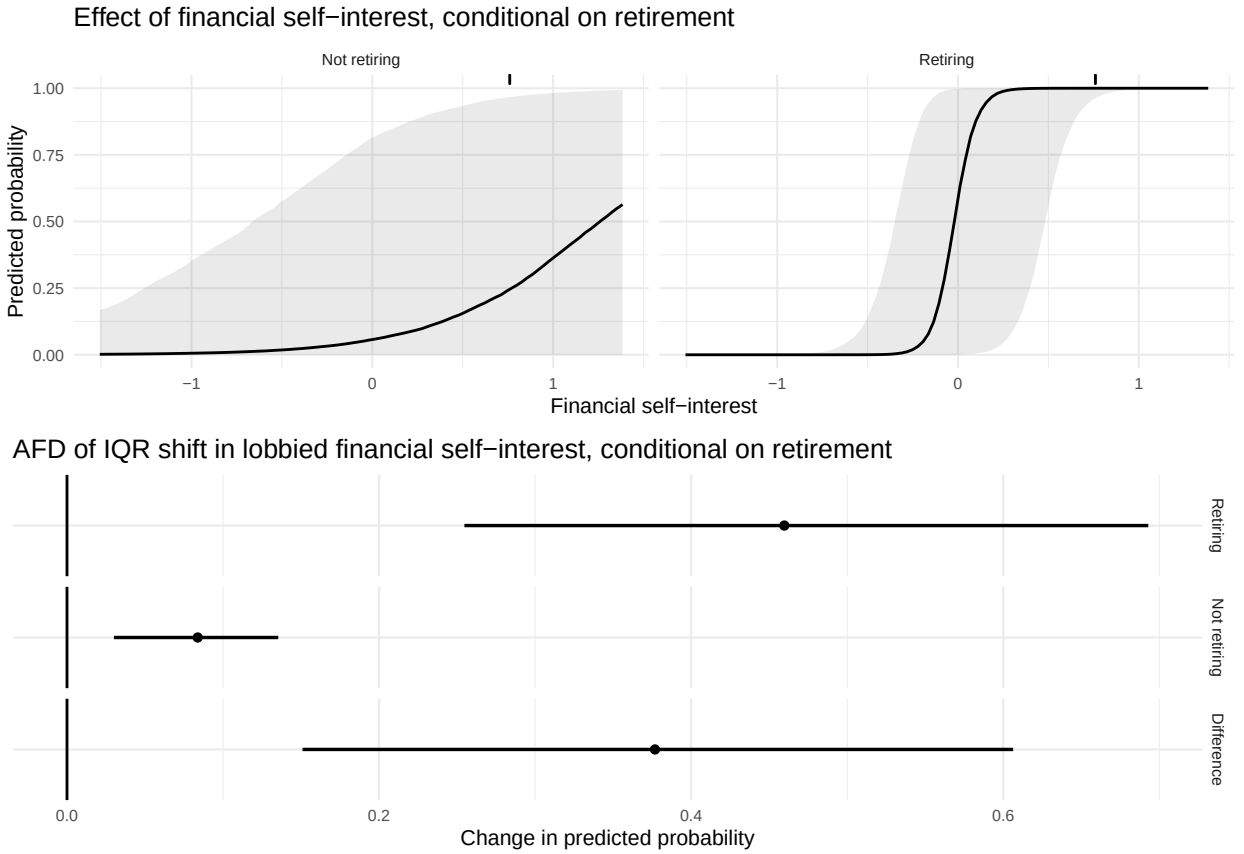

Figure 19: The effect of financial self-interest increases when politicians retire. 95% Bayesian high-density credible intervals based on 4000 draws from the posterior distribution. *Top panel:* Predicted probabilities for Jeff Bingaman—Democrat from NM—supporting the Colombia PTA (H.R. 3078, 112th) as lobbied financial self-interest increases, conditional on retirement. Bingaman was retiring and voted "Yea." *Bottom panel:* The average change in the predicted probability of voting in favor of PTAs that results from moving from the third quartile to the first quartile in lobbied financial self-interest, conditional on having announced retirement.

lobbied financial self-interest in Figure 19. I choose Jeff Bingaman's vote on the Colombia PTA in 2011 to show the typical effect of changing financial self-interest for a retiring Democrat. The difference between the counterfactuals is striking. The AFD confirms that the Bingaman example is not an extreme outlier—examing the effect across all observations shows that senators are about 38 percentage points more likely to support a PTA after an IQR shift in lobbied financial self-interest when they are retired than when they are not. An effect of this size is only possible if the combination of retirement and lobbied financial self-interest has nearly perfect predictive power over PTA support within senator pairs.

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