Exploring the Hiring, Pay, and Trading Patterns of U.S. Firms: The Dominance of Multinationals Engaged in Related-Party Trade*

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Abstract

We link U.S. job records with both firm-level business register and customs records to construct a novel set of summary statistics and descriptive regressions that highlight the central role of the small set of multinational firms (denoted RPXM firms) who engage in both importing and exporting with related parties in translating international trade shocks to shifts in labor demand.

We find that RPXM firms 1) dominate trade volumes; 2) account for very disproportionate shares of national employment and payroll; 3) employ greater shares of workers in higher pay deciles; 4) disproportionately poach other firms' high paid workers; 5) offer higher raises to their existing workers.

These hiring and pay patterns generally exist even among new RPXM firms, but strengthen with RPXM tenure, and continue to hold, albeit at smaller magnitudes, after conditioning on standard proxies for firm and worker productivity. Taken together, these findings reveal that RPXM status is a reliable proxy for the kind of firm that drives the initial labor market impacts of trade shocks, and that high paid workers are likely to be most directly exposed to such shocks.

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1 Introduction

International trade shocks can have sizable impacts on labor markets, with substantial heterogeneity in earnings and employment impact across workers from different industries and initial pay levels (Autor et al. 2014, Dix-Carneiro and Kovak 2017). However, better understanding how past and future changes in the international trade environment translate from product market shocks to labor market shocks requires assessing the types of firms that are most reliant on international trade and the kinds of workers they hire.

In this paper, we link U.S. job records with both establishment-level data and customs records to construct a novel set of summary statistics and descriptive regressions analyzing the relationship between firms' trading activities and their pay and hiring patterns.

We expand upon Handley et al. (2021), Kamal et al. (2022), and Setzler and Tintelnot (2021) by highlighting the particular need to distinguish multinational firms that both export to and import from related parties (foreign establishments of the same firm) from purely domestic importers and exporters as well as from multinationals whose related-party trade is unidirectional or nonexistent. We show that these particular kind of multinational firms (denoted by RPXM) are central to understanding which types of workers are likely to be directly exposed to trade wars, supply chain disruptions, and other trade shocks that target particular trading activities in specific industries.

Our first set of findings demonstrates that RPXM firms are outliers in both the labor and product markets. Even though only 0.24% of U.S. firms both export and import with related parties in a typical year, such firms account for 20% percent of U.S. employment, 28% percent of payroll, and 42% of revenue. They also disproportionately dominate international goods trade, accounting for 81.3% and 83.5% of U.S. goods exports and imports, respectively, including 75.0% and 68.3% of arms-length exports and imports. This reflects the fact that they trade much more intensively than firms that only import or export outside the firm. We also show that RPXM firms generally persist in related-party importing and exporting in subsequent years as well, while firms that only import or export often stop doing so or add the other activity. Collectively, these properties make RPXM status a reliable proxy for the kind of firm that drives the initial labor market impacts of trade shocks.

Our second set of findings reveals that annual earnings distributions at RPXM firms are quite left-skewed even relative to other importing and exporting firms, with considerably smaller shares of low-paid workers and much higher shares in the top U.S. earnings decile. This pattern holds in nearly every industry sector. We then show that RPXM status predicts over $8,000 in increased annual earnings (12% of their average per-worker pay) relative to other importing and exporting firms even when controlling flexibly for combinations of industry and firm revenue category and for firms' intensity of import-

ing and exporting. This suggests either that related-party trade captures an additional dimension of firm productivity beyond revenue and trade volume, or that related-party trade itself may directly affect firms' hiring and pay patterns.

Furthermore, by comparing specifications with and without worker fixed effects, we show that about 90% of RPXM, firms' excess pay per worker is due to superior worker which still leaves these firms paying a premium of about $750 on average and nearly $2,500 among the most export-intensive RPXMfirms.

In a third set of findings, we explore the mechanisms through which high-paid workers become concentrated at RPXM firms. We show that these firms disproportionately poach workers who were already paid in the highest decile, particularly those previously employed at other RPXM firms. To attract and retain such workers, RPXM firms offer new hires substantially higher pay than their previous positions and give existing employees substantially larger raises. Both sources of pay premia are particularly concentrated among the most export-intensive and experienced RPXM firms. This suggests that a very small group of highly productive multinationals are fiercely competing for the most talented workers, which in turn makes high-paid workers particularly exposed to trade shocks.

Taken together, our findings imply that a tiny and relatively consistent group of firms are disproportionately exposed to trade shocks. Hence, they likely mediate such shocks' short-run distributional impact on the labor market.[1] These insights demonstrate the need for quantitative models of trade that combine separate treatment of multinationals with worker skill heterogeneity, a la Setzler and Tintelnot (2021). They also illustrate the value of collecting related-party information as part of customs data in other countries.

Our paper relates most directly to three literatures. First, the mid-2000s arrival of firm-level administrative data spawned a wave of descriptive analyses examining the characteristics of exporting and importing firms (see, e.g., Bernard et al. 2007 and Bernard et al. 2012). These papers emphasize that manufacturing trading firms (particularly importers and exporters) tend to be larger, higher-paying, and more productive, and that a small share of firms accounts for a large share of total import and export volume. We contribute by showing that, even relative to firms that both import and export, the very few who do both activities with related parties are extreme in their employment, revenue, and reliance on international trade, and are quite stable over time. Furthermore, we show that RPXM firms display these patterns across a wide variety of industries beyond manufacturing.

Both Setzler and Tintelnot (2021) and Kamal et al. (2022) also document that multinationals typically feature greater employment, revenue, and average pay than purely do-

[1] As shown in Carballo and Mansfield (2025) and Pierce et al. (2024), the medium-run impact is also strongly shaped by labor market competition and product market spillovers, respectively.

mestic firms. However, they identify multinationals using foreign business tax payments rather than related-party trade transactions. Our trade-based classification isolates the subset of multinationals who are directly exposed to trade shocks. It also allows us to compare RPXM firms with arms-length importers and exporters, and to account for and assess the role of trade intensity and trade experience. Furthermore, we examine differences in pay across the entire distribution.

A second literature explores how and why trading firms exhibit higher average pay. Several theoretical papers emphasize that high-productivity firms are more likely to engage in international trade in general and related-party trade in particular (Melitz 2003, Halpern et al. 2015, Antras and Helpman 2004). Others hypothesize and provide evidence that more productive firms also benefit more from high-ability workers, and that labor market search frictions lead them to pay a premium to find their desired workers faster (e.g. Helpman et al. 2010, Lentz and Mortensen 2010, and Card et al. 2018). We show that even among trading firms, RPXM firms are distinct in both worker composition and pay premia, consistent with Setzler and Tintelnot (2021)'s comparisons of multinationals and non-multinationals. Moreover, we document that these firms' greater pay premia reflect both greater pay increases for new hires relative to these workers' outside options as well as higher raises.

Several papers in this literature have sought to establish that engaging in exporting causes higher pay (Araújo and Paz 2014, Macis and Schivardi 2016, Brambilla et al. 2017), perhaps because it generates additional rents that are partially shared with workers. Frías et al. (2022) show in the Mexican context that this causal effect operates via changes in both worker composition and pay premia for a given set of workers. While we do not seek to establish causality, our regression results are consistent with a causal effect on worker hiring and pay from establishing related- party trading relationships. In particular, we show that the differences in worker composition and pay premia extend to importing firms, are larger at importing and exporting firms, and are largest at RPXM firms.

Finally, a third literature highlights the growing power of a select group of "superstar" or "mega" firms. These firms have been classified as outliers using a variety of characteristics: employment, markups, productivity, worker composition, firm pay premia, digital capital, and innovation rate (Autor et al. 2020, Song et al. 2019, Tambe et al. 2020, Braguinsky et al. 2023). Our paper demonstrates that these firms also dominate international trade, both through arms-length and related-party transactions, which disproportionately exposes them to trade shocks even relative to their large size and justifies focusing primarily on their responses when evaluating shocks' initial labor market impact. We also show that RPXM status predicts pay and hiring patterns even conditional on other superstar-defining characteristics such as total employment and revenue.

2 Data

We construct a database that combines three large, restricted, administrative datasets from the U.S. Census Bureau: the Longitudinal Business Database (LBD), the Longitudinal Firm Trade Transactions Database (LFTTD), and the Longitudinal Employer-Household Dynamics database (LEHD). The LBD (U.S. Census Bureau, 2017a) leverages tax records from the universe of U.S. employing establishments to provide establishment-level data on annual employment, payroll, and industry. It also contains firm-level revenue for most firms. The LFTTD (U.S. Census Bureau, 2017b) consists of customs transaction data for all goods imports and exports indicating the importing or exporting U.S. firm, the value of the goods transacted, and whether the transaction was with a different firm (at arms-length) or a foreign establishment of the same firm (related-party). The LEHD (U.S. Census Bureau, 2014) reports quarterly earnings for each job (worker-firm) match for a sample of 25 states covering 60% of U.S. employment that approved our project.

We use this database to construct a firm-level sample and a worker-level sample. The former reflects all U.S. employing firms contained in the LBD-LFTTD merge from 2007-2017. The latter consists of a 30% random sample of the set of workers who appear in our 25-state LEHD in some year between 2007-2014 and whose firms are linked to the firm-level sample ($\sim$138M worker-years). This sample provides workers' detailed earnings and employment histories combined with their firms' characteristics from the LBD-LFTTD.

3 Trade Exposure Measures and Regression Specifications

We consider three ways to classify firms according to their trading patterns. Our primary classification, "trade engagement status", assigns each firm-year to one of the following categories: non-trading (NT), importer only (arms-length and/or related-party, denoted M), exporter only (arms-length and/or related-party, denoted X), exporter and importer with at most unidirectional related-party transactions (XM), and related-party importer and related-party exporter (RPXM). XM includes firms who import and export exclusively at arms-length along with firms whose imports *or* exports include related-party trade, but not both.[2] Regardless of how such firms are classified, one cannot cleanly compare RPXM and non-RPXM multinationals in our data, since multinationals that do not trade goods with their foreign affiliates cannot be distinguished from purely domestic firms.

We distinguish importers from exporters because exporting generally increases labor

[2]Unidirectional related-party traders exhibit pay patterns that more closely resemble XM firms than RPXM firms.

demand through increased output, while importing affects labor demand both through a similar scale effect (via lower unit costs) and a substitution effect that may reduce employment. Furthermore, exporting may alter worker composition by requiring employees who can arrange shipments and manage multiple product lines, while importing may cause offshoring of the production staff (Hummels et al., 2018). RPXM status may compound these effects by increasing firm productivity, requiring a broader set of managers to coordinate trade with foreign affiliates (Gumpert et al., 2021), and reorganizing supply chains in ways that may increase or decrease resilience to various trade disruptions.

Second, we also classify firms according to the total number of previous years in which they also featured the current year's status (0, 1, 2-3, or 4+). This allows us to analyze the persistence of firms' trade engagement and the rate at which the pay patterns of firms who change status converge to the norm in their new status.

Finally, our trade engagement categories focus on the extensive margin of whether a firm performs a particular trade activity, but are silent about how intensively they trade. The extent of firms' reliance on international trade is likely to determine the sensitivity of its costs and product demand, and therefore labor demand, to trade shocks. We measure import and export "intensity" via the ratio of a firm's total imports or exports to its total revenue, and assign import and export intensity quartiles based on these ratios' employment-weighted national distributions.

When analyzing firms' pay distributions, we assign each worker-year to one "dominant" firm that accounted for the largest share of the worker's earnings. To approximate full-year pay for workers who work fewer than four quarters at their dominant firms, we annualize earnings by multiplying by four their average quarterly earnings among "full" quarters that are preceded and followed by positive earnings.

We initially construct summary statistics to characterize the joint distribution of firms' pay policies and measures of trade engagement. These unconditional relationships are useful for forming prior beliefs about which workers are likely to be sensitive to trade shocks: workers disproportionately at the most heavily trading firms will, at least initially, be more exposed to trade shocks even if firms' trade activity and worker composition are jointly driven by other underlying factors such as firm productivity.

We then use several worker-level regression specifications to explore whether these unconditional relationships hold conditional on other firm and worker characteristics. Controlling for firm characteristics reveals whether trade engagement measures are valuable predictors of firms' labor market behavior above and beyond standard proxies for firm productivity and industry, while controlling for worker characteristics distinguishes differences in worker quality from composition-adjusted pay premia.

Let $j(i,t)$ capture worker i's dominant firm in year t. Our baseline regression specifi-

cation is:

$$Y_{it} = \sum_{e} 1(Trade\ Engagement_{j(i,t)t} = e)\beta^{e} + \mathbf{D}^{n \cdot fs}_{j(i,t)t}\boldsymbol{\omega}^{n \cdot fs} + \epsilon_{it} \tag{1}$$

We initially use annualized earnings as the outcome Y_{it}, but we also consider earnings growth between $t-1$ and t as well as indicators for whether worker i's earnings fall into a given national earnings decile.

$1(Trade\ Engagement_{j(i,t)t} = e)$ selects the worker's trade engagement status e, while β^{e} captures the outcome change associated with working in a status e firm rather than a non-trading firm (the omitted category). $\mathbf{D}^{n \cdot fs}_{j(i,t),t}$ represents a design matrix that selects combinations of 4-digit NAICS industry and firm-size decile, with $\boldsymbol{\omega}^{n \cdot fs}$ capturing the corresponding industry-by-size fixed effects. Firms are assigned to national employment-weighted size deciles based on employment or revenue, depending on specification. ϵ_{it} captures remaining determinants of Y_{it}, including measurement error.

Augmented specifications add worker fixed effects or initial earnings decile fixed effects (for the earnings growth outcome) or replace the trade engagement status indicators with indicators for combinations of trade engagement status and either status experience categories or import or export intensity quartiles.

4 Results

4.1 Trade Engagement, Intensity, and Experience Distributions

The top left panel of Table 1 shows a remarkable concentration of the U.S. economy among the mere 0.24% of firms engaging in related-party exporting and importing. These few firms generate 20% of employment, 28% of payroll, and 48% of U.S. revenue. They also dominate U.S. international trade, accounting for 81.4% of all exports and 83.5% of imports. Including other trade engagement forms, trading firms collectively hire 53.0% of workers, pay 62.6% of earnings, and generate 73.4% of revenue, consistent with Handley et al. (2021). The panel highlights that both organizational structure (arms-length versus related-party) and type of trade activity (imports, exports, or both) shape the interplay between trade and the labor market.

The second panel shows that substantial heterogeneity exists across industries in trade status' shares of employment, but that trading firms still account for a substantial share of employment, payroll and revenue even in less trade-oriented sectors such as education/health and leisure/hospitality.

Table 1's top right panel displays various quantiles of the worker-weighted distributions of export and import intensity by trade engagement status. Even though a large share of

X and M employment occurs in firms that rely very little on international trade, RPXM employment is much more concentrated among intensively trading firms. For example, the 75th and 95th export intensity quantiles are 8.0% and 30.6% for RPXM firms versus 1.0% and 12.8% for X firms. For import intensity, the 75th and 95th quantiles are 10.9% and 36.8% for RPXM firms versus 0.03% and 5.8% for M firms.

The third panel displays each trade status' share of employment among firms in each national export or import intensity quartile. M, X, and XM firms account for most of the employment in the bottom two quartiles of export and import intensity, while RPXM firms account for most employment in the top two quartiles. This contrast is even stronger for revenue (see Carballo et al. (2024)), with 23.2% (23.8%) of national revenue generated by RPXM firms in the top export (import) intensity quartiles. Thus, even among the small pool of RPXM firms, it is the tiny subset that most relies on trade that particularly influences both labor and product markets.

The rightmost columns in Table 1's third panel explore each engagement status' distribution of employment across categories of within-status experience. Firms with 4+ years of RPXM experience account for a very large share (82.5%) of RPXM employment, while firms with 4+ years of experience within their current trade engagement status only employ 35.9%, 20.7%, and 32.1% of workers in the M, X, and XM categories, respectively. This primarily reflects the fact that 87.9% of RPXM employment is concentrated at firms that persist in intrafirm importing and exporting the following year, while status-persisting firms employ only 58.3%, 46.9% and 69.2% of M, X, and XM workers, respectively. These patterns suggest that RPXM status is sufficiently stable to proxy for these firms' general trade engagement over several years, while the trade activities of firms in other engagement categories are far more volatile.

More generally, the fourth panel's first five columns show that trade status changes become less frequent as the firm gains experience within its current form(s) of trade activity. This increased stability is particularly pronounced among RPXM firms, so that 95% of employment at firms with 4+ years of RPXM experience is concentrated among firms that continue to export and import with related parties.

Table 1's fourth panel provides the employment-weighted breakdowns of the following year's trade engagement status. The negligible flows from NT, X, and M to RPXM reveal that most firms that begin related-party importing and exporting were already performing both activities at arms length in the previous year. Only 3.7% of all XM firms transition to RPXM status, but these firms are disproportionately large, so they account for nearly half of the XM employment at status-changing firms. By contrast, the bulk of M and X employment among firms that change status is roughly equally split between firms that stop trading internationally altogether and firms that start exporting or importing, respectively.

RPXM firms' size, persistence, and reliance on (and dominance of) international trade ensure that their responses to trade shocks will primarily determine how such shocks affect labor demand. Note, though, that if these firms' hiring and pay policies closely resembled those of non-traders and arms-length importers and/or exporters, then their disproportionate exposure to trade shocks would minimally impact these shocks' labor market incidence. However, the next section documents that RPXM firms actually exhibit pay distributions and hiring/retention patterns that differ dramatically even from other trading firms.

4.2 Relating Firm's Trade Activities and Pay Distributions

Figure 1's top panel plots the share of workers within each national earnings decile by trade engagement status. The concentration of employment within high-paying deciles is particularly striking for RPXM firms: only 6.6% of their workers come from the bottom decile, while top decile workers are particularly overrepresented (17%). Other kinds of trading firms generally have very slightly increasing shares as one moves toward higher deciles, while NT firms have a far less favorable earnings distribution, with employment shares that strictly decrease in earnings decile. In nearly every supersector, RPXM and NT feature the most and least generous pay distributions.

These patterns generally hold once we control for standard firm productivity proxies such as employment, revenue, and industry. The regression-adjusted annual earnings gaps presented in the narrow bars of Figure 2's top left panel show that RPXM workers earn \$20,590 more than NT workers even after introducing fixed effects for combinations of 4-digit industry and worker-weighted employment decile. The conditional earnings gap relative to NT is smaller but still sizable for other kinds of trading firms: \$3,647 for X, \$6,540 for M, and \$10,240 for XM. Using revenue rather than employment to assign size deciles (second panel) produces qualitatively similar patterns but significantly smaller magnitudes, with the adjusted earnings gap falling by 58% to \$8,648 for RPXM and by 70%-90% for the other trading statuses. Thus, trade engagement may capture a similar dimension of firm productivity as revenue, making it a useful proxy when trade data is available but revenue data is not. Nonetheless, RPXM status still strongly predicts firm pay even conditional on revenue as this smaller earning premia is 12.8% of their average LBD per-worker pay.

These earnings coefficients reflect both RPXM firms' tendency to hire and retain high-skilled workers as well as the premia they pay relative to workers' outside options. To isolate pay premia, the wide bars capture the parts of the original coefficients that remain after controlling for worker composition via worker fixed effects. Adding worker fixed effects generally reduces trade status coefficients by around 90%. Thus, disproportionate hiring of high-productivity workers accounts for the lion's share of trading firms' elevated

per-worker pay. Nonetheless, RPXM firms pay annual premia of $2,443 and $748 when employment-based and revenue-based size controls are used, respectively. The RPXM premia are statistically significantly higher than XM premia, even though both types export and import.

Next, we explore how these conditional premia contribute to the distributional differences in pay across trade engagement categories above. The right parts of Figure 2's first two panels display each trade status's effect on the probability that a worker's earnings falls into each earnings decile, conditional on other firm and worker characteristics. With employment-based size controls, RPXM status predicts a significantly more left-skewed firm earnings distribution than any other status. For example, it increases a worker's top decile probability by 8.4 percentage points and reduces the bottom decile probability by 5.0pp, relative to working in a NT firm. More generally, workers at trading firms are less frequently in each below-median decile and more frequently in each above-median decile than NT workers, with coefficients that grow in magnitude at the ends of the distribution, so that the coefficients on top (bottom) decile probabilities for XM, X, and M firms are 3.8pp (-3.5pp), 1.3pp (-1.6pp), and 2.4pp (-2.2pp), respectively.

Adding worker fixed effects does not change the shape of the pattern or the ordering of statuses, but dramatically reduces the magnitudes, indicating that skill composition differences explain the bulk of trade engagement status' predictive power throughout the earnings distribution. Nonetheless, with employment-based size controls, working in a RPXM firm still predicts a 3.8% (-2.3%) change in the top (bottom) decile probability, even when compared to that worker's samplewide average.

Using revenue-based controls (second panel) weakens these relationships, but still workers are more likely to be paid above the national median when working at any type of trading firm, and that RPXM firms pay in the bottom deciles infrequently. In particular, working at a RPXM firm still decreases the bottom decile probability by 1.5% (0.7%) when worker fixed effects are excluded (included).

We next examine whether greater trade intensity also contributes to more generous pay in the second and third panel of Figure 1. Among RPXM firms, high intensity is associated with a shift toward higher pay deciles, with the most export intensive RPXM firms paying 30% of employees in the top earnings decile compared to 9% and just 2% in the 5th and bottom deciles. By contrast, among X and XM firms the earnings distribution is slightly *less* generous for the top vs. bottom export intensity quartile. The same pattern emerges for import intensity (third panel): larger shares of high paid employees at the most import intensive RPXM firms and smaller shares of high paid employees at high intensity M and XM firms.

Figure 2's third panel confirms that these findings generally hold when industry $\times$ revenue decile controls are introduced. In particular, the positive relationship between

export intensity (first five histograms) and earnings is quite weak among X firms, stronger among XM firms, and extremely powerful for RPXM firms: predicted earnings are more than \$10,000 higher for RPXM workers at top export quartile firms than at bottom quartile firms, compared to gaps of $\sim$ \$5,000 and \$1,000 for XM and X workers. The results for import intensity (last five histograms in Figure 1) are qualitatively similar but more muted, with milder and less consistent increases in predicted pay with greater intensity. We also see clear, ascending pay gaps within each export (or import) intensity quartile as one moves from X (or M) to XM to RPXM firms. Thus, both the unconditional and conditional results indicate that the nature and intensity of trade both predict firm pay distributions, and that intensity more strongly predicts pay at RPXM firms than at other trading firms.

Consistent with the trade engagement results that pool intensities, adding worker fixed effects (wider bars) shrinks pay gaps by status and by intensity quartile within status by 80-90%, suggesting that both sources of pay differences are primarily driven by worker composition rather than pay premia. However, pay premia at RPXM firms in the top export intensity quartile remain quantitatively important - an additional \$2,500-\$3,000 in annual earnings relative to a worker's samplewide average when compared to bottom quartile RPXM firms or to X firms.

Figure 1's fourth panel shows that earnings distributions are fairly similar across low and high experience categories within most trade engagement statuses. Thus, either firms' pay distributions already resemble those of their new status before they transition or their pay distributions converge very quickly to the their new status' norm.

That said, there are subtle changes in pay with greater status-specific experience. RPXM firms with 4+ years of experience, who have a proven ability to operate successfully as multinationals, feature the most left-skewed pay distributions. In contrast, XM firms' pay distributions become less generous with experience, perhaps because high XM experience indicates insufficient productivity to become a full RPXM multinational.

To assess sensitivity to industry$\times$size controls, Figure 2's fourth panel reports separate earnings coefficients by experience category within each trade engagement status. Even firms who just attained RPXM status already pay \$2,735 more than non-trading firms conditional on industry and revenue-based firm-size. Additional RPXM experience predicts substantial further increases in pay per employee of \$6,577 after one year, \$7,983 after 2-3 years, and \$10,054 after 4+ years. Adding worker fixed effects reveals that the high pay of firms new to RPXM purely reflects the quality of workers they employ, as their annual earnings premium is actually lower than those of either new or experienced non-trading firms. Instead, the status' higher overall pay premium is driven by an estimated \$1,149 premium for firms with 4+ years of RPXM experience.

Our worker fixed effect results suggest that trading firms generally and RPXM firms

in particular attract and retain a disproportionate share of workers who command high pay regardless of their firm. The following section explores the mechanisms by which they do so.

4.3 How Do Multinational Firms Attract High-Skill Workers?

Figure 1's last panel displays the shares of new hires by each trade engagement category whose prior year pay fell into each earnings decile. Job movers' prior year earnings tend to be low regardless of destination, since low pay partly explains their willingness to incur job switching/search costs. However, new hires by trading firms and particularly RPXM firms show less negative selection on prior pay, and RPXM firms show a unique propensity to attract workers already in the top earnings decile.

This is partly driven by RPXM firms' disproportionate tendency to hire workers from other RPXM firms that we showed pay high earnings premia, particularly to their highest-paid workers. Workers coming from RPXM firms constitute 41.8% of RPXM hires, but no more than 21.4% of new hires for any other status. More generally, each trade status hires a disproportionate share of workers from other same-status firms. This is consistent with trading firms valuing workers with experience in coordinating relevant trade activities, though the pattern could also reflect match effects on other firm characteristics correlated with trade engagement status, such as experience in the hiring firm's industry.

However, the trade status composition of RPXM hires only partly explains their propensity to attract the highest-paid workers, since even among RPXM job leavers, RPXM destinations disproportionately poach those from the top decile (46% vs. 12% for XM destinations). By contrast, workers leaving NT, M, and X firms generally exhibit lower prior earnings among those going to RPXM firms than to other trade statuses. Thus, RPXM firms seem to be primarily targeting initially high-paid workers with RPXM experience.

Figure 3's top panel reinforces this point by presenting coefficients from regressions that allow the earnings impact of the hiring firm's trade engagement status to depend on the status of the worker's origin firm. The thin bars show that workers hired from other same-status firms generally enjoy higher pay. This is particularly true of RPXM firms, who pay $14,144 more to their hires from RPXM firms compared to those from XM firms even after accounting for revenue/industry differences. While this primarily reflects their selective poaching of the high-paid workers from such firms, the pattern remains, albeit at much lower magnitudes, when worker fixed effects are included (wide bars). This suggests a willingness by RPXM firms to pay a premium for existing RPXM workers above and beyond these workers' outside options, consistent with RPXM firms

disproportionately valuing prior multinational experience.

The cross-sectional premia paid by RPXM firms reflects a blend of higher initial pay for new hires and higher raises to retain valued employees after they arrive. To see this, Figure 3's second panel examines regressions capturing worker earnings growth rather than levels. All growth specifications control for workers' initial earnings deciles along with revenue decile × NAICS fixed effects. The left sets of bars report average percentage premiums paid to job stayers and new hires at firms of each trade engagement status relative to the corresponding pay premia at NT firms.

While job switchers generally enjoy much greater earnings growth than stayers regardless of trade status, both stayers and new hires' earnings grow faster at trading firms than at NT firms. However, the premia are about twice as large at RPXM firms as XM firms (0.67% vs. 0.35% extra growth for stayers, 6.5% vs. 3.3% for new hires compared to the non-trading average, with both differences statistically significant). Furthermore, RPXM firms' larger raises translate to lower worker turnover rates: 19.5% compared to 21.3% for XM and 26.8% for NT, with particularly low RPXM turnover rates among top decile workers (13.7%), consistent with the evidence that their pay policies are geared toward retaining their most skilled workers.

Figure 3's second panel also shows that workers leaving RPXM firms experience disproportionately large percentage earnings losses unless they get hired by another RPXM firm. This reinforces the idea that these workers have context-specific experience or skill that is not fully utilized at non-multinational firms, incentivizing them to stay within the RPXM sector.

Columns 1-4 of Table 2 display estimated growth premia for both new hires and stayers for combinations of trade status and intensity. Conditional on either export or import intensity, earnings gains for new hires and raises for job stayers are both consistently higher at RPXM firms than either X or XM. Among new RPXM hires, those joining firms in the top export quartile receive 5-7% larger initial earnings increases than those joining firms in lower intensity quartiles. Then such workers experience subsequent annual earnings growth that is 0.2%-0.5% faster. Both gaps reverse in sign for X, while for XM the earnings growth gaps are somewhat smaller for new hires and similarly sized for stayers. Few systematic differences exist in earnings growth by import intensity within trade engagement status for either hires or stayers for any status, suggesting that export intensity more strongly predicts pay policies than import intensity.

Columns 5 and 6 display growth premia for new hires and stayers by combinations of trade status and experience within a status. Among firms with 4+ years of experience within their current status, RPXM firms exhibit pay growth premia for new hires and for retained workers that are at least 3pp and 0.3pp higher than any other trade status.

Among RPXM firms, growth premia for new hires increase monotonically with status

experience, and are more than twice as large at the most experienced firms as at those first gaining RPXM status. The results for stayers show greater pay raises for RPXM firms with 4+ years of experience (1%) than those with 0 or 2-3 years (around 0.2%), although we find a noisily estimated 1.5% raise premium among the few workers at RPXM firms with 1 year of experience.

Synthesizing the earnings growth results from Figure 3 and Table 2, we find that among RPXM firms, the types with particularly left-skewed pay distributions generally lure new hires with considerably higher salaries than they previously received and induce them to stay with larger raises. Thus, the combination of long-lived RPXM status and high trading volume as a share of revenue may be a particularly accurate proxy for underlying firm productivity and for complementarity with worker skill. Overall, our results strongly suggest that it is the highest paid workers whose earnings are most exposed to international trade shocks, since they receive substantial pay premia that are concentrated among this small set of very large RPXM firms.

5 Conclusion

In this paper, we leverage linked data combining firm-level customs and revenue information with job-level records to investigate the relationship between firms' trade activities and their hiring and pay practices. We show that multinationals engaging in bi-directional related-party trade are far more reliant on international trade for both their inputs and their sales than other trading firms, including those importing and exporting at arms-length, and that they are far more likely to employ the highest-paid workers and far less likely to employ the lowest-paid workers in the U.S. economy. This primarily reflects a greater tendency to attract and retain the highest skilled workers. However, we also find that these firms pay both higher initial salaries and larger raises relative to what these same workers received at other firms, which may be a key mechanism by which they attract top talent. These relationships continue to hold, albeit with smaller magnitudes, when we control for a firm's industry, employment, and even revenue. This suggests that these trade engagement classifications are not merely duplicative proxies for unobserved total factor productivity, but instead provide independent predictive power. In addition, we show that firms who become related-party importers and exporters tend to remain so, and that their pay patterns very quickly converge to multinationals with considerable experience with such activities. These findings demonstrate the importance of obtaining information on the organizational structure of firms' trade, which is rarely collected outside the U.S.

Taken together, our results suggest that 1) these multinationals' responses to international trade shocks mediate the shocks' labor market impact, and 2) the workers most

immediately impacted by these adjustments are disproportionately highly paid. Thus, a complete understanding of the contribution of trade globalization to inequality and the incidence of particular trade shocks requires a greater focus on the responses of multinational firms. In particular, the equilibrium labor market impact of trade shocks also depends on the flexibility of $RPXM$ firms' supply chains, their ability to offshore particular kinds of workers, and the portability of those workers' skills to other job opportunities. We pursue the latter issue in parallel work (Carballo and Mansfield (2025)).

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6 Tables and Figures

Table 1: Characterizing Differences in Employment, Payroll, Revenue, and Trade Intensity, Experience and Persistence by Baseline Trade Engagement Status

	Shares by Trade Engagement						Trade Intensity Percentiles					
							Exports			Imports		
	Firms	Emp	Payroll	Rev	Exp	Imp	P50	P75	P95	P50	P75	P95
NT	0.927	0.474	0.375	0.269								
X	0.023	0.042	0.040	0.037	0.055		0.010	0.127	0.685			
M	0.029	0.110	0.112	0.086		0.035				0.003	0.058	0.496
XM	0.019	0.168	0.193	0.188	0.132	0.130	0.004	0.096	0.556	0.008	0.146	0.614
RPXM	0.002	0.207	0.280	0.421	0.813	0.835	0.080	0.306	0.663	0.109	0.368	0.715

	Employment Shares by Industry									
	NR	Cons	Man	TTU	Inf	FRE	PBS	EH	LH	Oth
NT	0.399	0.721	0.131	0.262	0.231	0.474	0.518	0.584	0.676	0.809
X	0.040	0.031	0.052	0.033	0.036	0.064	0.060	0.031	0.043	0.029
M	0.103	0.126	0.054	0.098	0.080	0.064	0.064	0.204	0.093	0.061
XM	0.201	0.073	0.228	0.229	0.183	0.234	0.151	0.149	0.110	0.050
RPXM	0.257	0.050	0.534	0.378	0.470	0.164	0.207	0.032	0.078	0.051

	Employment Shares by Intensity and Experience											
	Export Intensity				Import Intensity				Experience			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	0	1	2-3	4+
NT									0.045	0.060	0.134	0.761
X	0.098	0.125	0.113	0.056					0.333	0.203	0.251	0.213
M					0.328	0.257	0.119	0.043	0.203	0.158	0.264	0.375
XM	0.672	0.381	0.277	0.163	0.511	0.422	0.257	0.157	0.187	0.181	0.299	0.334
RPXM	0.230	0.494	0.610	0.781	0.160	0.322	0.624	0.800	0.038	0.042	0.093	0.827

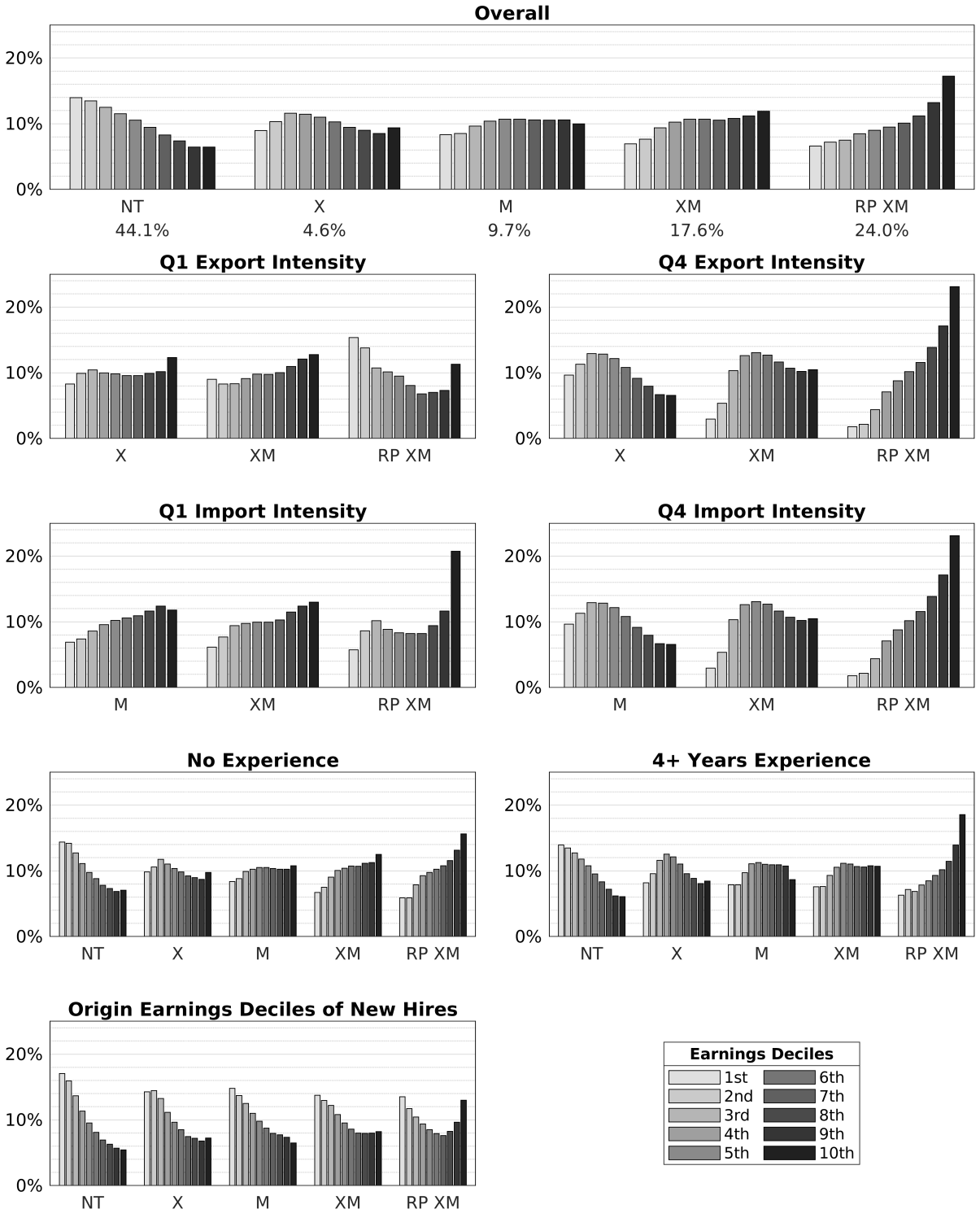
	Firms' Engagement Status Transition									
	Status Persistence					Destination				
	All	0	1	2-3	4+	NT	M	X	XM	RPXM
NT	0.912	0.777	0.857	0.840	0.937	0.912	0.055	0.025	0.007	0.000
X	0.462	0.320	0.413	0.525	0.660	0.278	0.057	0.469	0.184	0.012
M	0.583	0.383	0.496	0.579	0.738	0.237	0.583	0.020	0.155	0.005
XM	0.695	0.549	0.637	0.721	0.790	0.018	0.101	0.046	0.692	0.143
RPXM	0.887	0.430	0.493	0.708	0.949	0.001	0.003	0.002	0.116	0.879

	Average Pay Per Worker (000s)											
	Overall	Export Intensity				Import Intensity				Experience		
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	0-1	2-3	4+
NT	39.34									39.79	39.43	39.09
X	48.08	55.85	47.37	43.43	42.49					50.07	47.30	45.23
M	50.53					57.34	50.73	45.12	46.00	51.70	50.66	50.02
XM	56.97	58.69	56.98	56.15	59.07	62.72	58.56	51.99	49.45	60.88	58.99	53.00
RPXM	67.21	54.04	52.59	60.41	82.99	79.45	67.30	57.98	69.52	67.10	60.82	69.01

Source: LBD/LFTTD 2007-2014 - 77.7 million firm-year observations.

Notes: The top left panel shows the trade engagement status composition of U.S. firms, employment, payroll, revenue, goods imports, and goods exports, respectively. The top right panel show chosen percentiles of the distributions of export and import intensity by trade status. The next three panels display the trade status composition of employment by industry, export intensity quartile, and import intensity quartile, while the subsequent panel reports for each trade engagement status the shares of employment within firms category of cumulative experience within the chosen status. The fourth left panel reports the shares of employment accounted for by firms that stay within the same trade engagement status the following year, by initial status and prior experience within that status. The fourth right panel shows the employment-weighted distribution of subsequent year trade statuses among firms in each origin trade engagement status. The bottom panel shows the average per-worker pay in thousands by trade status, export intensity, import intensity, and by cumulative experience.

Figure 1: Annual Earnings Distributions by Trade Engagement Status: Overall and by Trade Intensity and Experience Category



Source: LEHD/LFTTD 2007-2014 - 138 million worker-year observations.
Notes: The top panel of Figure 1 displays the distribution of annualized earnings deciles among worker-years within firms in each trade engagement category. For engagement categories associated with importing and/or exporting, the next two rows of panels display their decile distributions separately by top vs. bottom export or import intensity quartile. The panels in the fourth row displays separate decile distributions for the top and bottom cumulative experience categories within each trade engagement status. The final panel displays the prior year earnings distribution among new hires made by firms in each trade engagement status.

Figure 2: Worker Composition or Earnings Premia: Sensitivity of Annual Earnings Gaps by Trade Engagement Status to the Inclusion of Worker Fixed Effects

Source: LEHD/LFTTD 2007-2014 - 138 million worker-year observations.
Notes: The narrow bars left of the vertical line in panels 1 and 2 of Figure 2 display coefficients capturing residual gaps in current earnings levels by trade engagement status relative to workers at non-trading firms after controlling for combinations of supersector and either firm employment category (panel 1) or revenue category (panel 2). The wide bars display updated coefficients after also conditioning on worker fixed effects. Panels 3 and 4 display corresponding residual earnings gaps (using revenue-based firm-size controls) by combination of trade engagement status and either export/import intensity quartile (panel 3) or cumulative experience within the status (panel 4). The line graphs right of the vertical line in panels 1 and 2 display coefficients capturing residual gaps in the probabilities of landing in different earnings deciles by trade engagement status after removing size×industry and worker fixed effects.

Figure 3: Annual Earnings and Earnings Growth Premia by Origin and Destination Trade Engagement Status

Source: LEHD/LFTTD 2007-2014 - 138 million worker-year observations.
Notes: Notes: The bars left of the vertical line in Figure 3 display coefficients capturing residual gaps in current earnings levels (first panel) or percentage growth (second panel) among retained workers (i.e. job stayers) and new hires by trade engagement status relative to those staying at or hired by non-trading firms. The bars right of the vertical line display coefficients capturing residual gaps in current earnings levels or earnings growth among newly hired workers by combination of origin (bars) and destination (labels) trade engagement status relative to newly hired non-trading workers coming from other non-trading firms. The thin bars in the first panel are based on a model that residualizes using only indicators for combinations of firm revenue decile and supersector, while the model underlying the wide bars also includes worker fixed effects in the conditioning set. The second panel controls for firm revenue decile × supersector combinations as well as indicators for earnings deciles in the prior year.

Table 2: Higher Initial Earnings or Faster Raises? Earnings Growth Premia among Stayers and New Hires by Trade Engagement Status and Trade Intensity or Experience

	Intensity	Export		Import			Trade Experience		
	Quartile	Stayers	Hires	Stayers	Hires		Years	Stayers	Hires
NT						**NT**	**0**	0.59%♦	3.6%♦
								(0.18)	(0.21)
							1	0.31%♦	2.3%♦
								(0.088)	(0.13)
							2 – 3	0.46%♦	0.76%♦
								(0.052)	(0.13)
							4+		
X	**1st**	0.33%▲	0.76%			**X**	**0**	0.29%▲	0.44%
		(0.16)	(1.2)					(0.15)	(0.41)
	2nd	-0.065%	0.056%				**1**	0.5%♦	1.2%♦
		(0.13)	(0.7)					(0.16)	(0.44)
	3rd	-0.015%	0.051%				**2 – 3**	0.14%	0.57%
		(0.088)	(0.54)					(0.18)	(0.38)
	4th	0.12%	-0.52%				**4+**	0.08%	-0.087%
		(0.08)	(0.57)					(0.17)	(0.52)
M	**1st**			0.32%♦	2.3%♦	**M**	**0**	0.74%♦	2.3%♦
				(0.12)	(0.66)			(0.16)	(0.27)
	2nd			0.19%▲	2.5%♦		**1**	0.23%	2.2%♦
				(0.085)	(0.51)			(0.16)	(0.42)
	3rd			0.54%♦	3.4%♦		**2 – 3**	0.18%	1.5%♦
				(0.12)	(0.55)			(0.13)	(0.36)
	4th			0.62%♦	3.4%♦		**4+**	0.68%♦	1.4%♦
				(0.15)	(0.79)			(0.16)	(0.36)
XM	**1st**	0.17%	2.1%▲	0.16%	2.3%♦	**XM**	**0**	0.56%♦	2.5%♦
		(0.14)	(0.82)	(0.13)	(0.8)			(0.14)	(0.36)
	2nd	0.29%△	2.5%♦	0.27%▲	2.8%♦		**1**	0.43%▲	2.6%♦
		(0.15)	(0.78)	(0.12)	(0.66)			(0.17)	(0.35)
	3rd	0.39%♦	4%♦	0.67%♦	4.9%♦		**2 – 3**	0.54%♦	2.6%♦
		(0.11)	(0.65)	(0.15)	(1)			(0.14)	(0.43)
	4th	0.82%♦	6.2%♦	0.43%▲	4.2%♦		**4+**	0.71%♦	1.5%♦
		(0.11)	(0.57)	(0.2)	(1.4)			(0.17)	(0.52)
RPXM	**1st**	0.74%	5%♦	0.72%▲	6.1%♦	**RPXM**	**0**	0.17%	2.2%♦
		(0.54)	(1.6)	(0.36)	(1.6)			(0.44)	(0.7)
	2nd	0.39%	3.2%▲	0.38%△	5.8%♦		**1**	1.5%▲	2.9%♦
		(0.35)	(1.3)	(0.2)	(1.3)			(0.61)	(0.69)
	3rd	0.46%	4.7%♦	0.96%♦	6%♦		**2 – 3**	0.2%	3.9%♦
		(0.28)	(1.2)	(0.22)	(1.1)			(0.32)	(0.65)
	4th	0.9%♦	10%♦	0.61%▲	7.4%♦		**4+**	1%♦	4.5%♦
		(0.16)	(1)	(0.24)	(1.1)			(0.19)	(0.53)

Source: LEHD/LFTTD 2007-2014 - 138 million worker-year observations.

Notes: ♦: p<0.01; ▲: p<0.05; △: p<0.1. Columns 1-2 of Table 2 display the estimated residual gap in expected annual percentage growth of earnings by combination of trade engagement status and export intensity quartile among retained workers (col. 1) and among new hires (col. 2) after controlling for the worker's prior year earnings decile along with firm revenue decile × industry supersector fixed effects. Columns 3-4 interact engagement status and import intensity rather than export intensity, while columns 5-6 interact trade engagement status with categories of firm cumulative experience within the current status. The coefficients from each pair of columns are generated by the same earnings growth regression.