Entrepreneurs' Diversification and Labor Income Risk

Jan Bena [*] Andrew Ellul [†] Marco Pagano [‡]

Valentina Rutigliano [§]

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Abstract

Entrepreneurs with better diversified portfolios provide more insurance to employees against labor income risk: in a sample of over 524,000 Canadian firms and 858,000 owners, firms owned by more diversified entrepreneurs offer more stable jobs and earnings to employees when faced by idiosyncratic shocks. A one standard deviation increase in owner's diversification reduces the shock's pass-through rate to labor layoffs by 13% and to workers' earnings by 41%. The data are consistent with such insurance being partly provided to retain valuable human capital and partly to avoid costly terminations. There is no evidence of insurance being priced in average wages.

[*]Sauder School of Business, University of British Columbia. Email: jan.bena@sauder.ubc.ca.
[†]Kelley School of Business, Indiana University; CSEF, CEPR and ECGI. Email: anellul@indiana.edu.
[‡]Università di Napoli Federico II, CSEF, ECGI and EIEF. E-mail: pagano56@gmail.com.
[§]Sauder School of Business, University of British Columbia. Email: valentina.rutigliano@sauder.ubc.ca.

1 Introduction

Labor income risk, which originates from the possibility of dismissal and earnings fluctuations, is key to social welfare, wages being the primary source of income for most people. The consequences of dismissals may extend far beyond the temporary income loss experienced during unemployment spells: displaced workers often suffer persistent scarring effects, in the form of permanent earnings losses, as well as physical and mental health harm.[1] Hence the provision of employment and wage insurance is key to mitigate these socially destructive consequences of unemployment. Firms can play a crucial role in providing implicit insurance to their employees (Azariadis, 1975; Baily, 1974), absorbing most of the risk arising from shocks hitting them rather than passing them to employees via wage cuts or dismissals (Guiso et al., 2005; Ellul et al., 2018)).

This paper investigates the role that the firm owner's diversification plays in the provision of such insurance in closely held firms. The idea is that entrepreneurs' ability to insulate workers from adverse shocks should depend on how badly their own wealth is hit by those shocks in the first place. Hence, their own level of portfolio diversification will determine their ability to honor the implicit contract with their employees. Past research has been silent on this channel of within-firm risk sharing.

Entrepreneurial households hold a substantial portion of their wealth in the form of equity in their firms: their wealth tends to be highly. concentrated, often in a single private company (Moskowitz and Vissing-Jørgensen, 2002). Their frequent lack of diversification may limit the extent to which they can insulate their employees from firm shocks: an undiversified entrepreneur may be more inclined to dismiss employees or cut wages in response to a shock hitting the firm she owns, to mitigate her loss. As the vast majority of

[1]Even upon re-joining the workforce, the unemployed frequently experience substantial, long-term earnings losses due to skill depreciation (Edin and Gustavsson, 2008), the loss of firm-specific human capital (Jacobson, LaLonde and Sullivan, 1993), and signalling-induced reputational damages (Gibbons and Katz, 1991). Unemployment is associated with a deterioration in physical and mental health conditions and increased mortality risk (Paul et al., 2018; Reeves et al., 2012; Roelfs et al., 2011). The harmful effects of job loss also extend to the households of displaced workers, whose families are more likely to experience financial hardship and divorce (McKee-Ryan and Maitoza, 2018). Youths are particularly vulnerable as parental job loss reduces children's educational attainments (Kalil and Wightman, 2011).

the private labor force is employed in closely held firms, most of which small and medium-size enterprises (SMEs),[2] owners' diversification may be a crucial driver of labor income insurance provision for a large share of the labor force. Yet, to this date there is no empirical evidence on the role played by shareholders' portfolio characteristics in firms' provision of implicit insurance to workers.

Shareholders' ability to provide insurance against labor income risk can be expected to be greatest when firm-level shocks are idiosyncratic and shareholders hold a well-diversified portfolio of private equity stakes. We test this prediction on a sample of 524,000 Canadian private firms and their 858,000 shareholders, for which the Canadian Employer-Employee Dynamics Database (CEEDD), a set of linkable administrative files comprising individual and corporate tax records, provides information on firm equity ownership. This enables us to identify which firms are owned by the same individual shareholder and thus measure the owners' portfolio diversification. We link CEEDD to export data, available for each firm between 2010 and 2017, so as to measure each firm's exposure to exchange rate shocks. Our sample consists of a firm-shareholder panel of 3.7 million observations with an average of 301,000 firms and 456,000 shareholders per year. To study the effect of diversification on employees' earnings, we augment our sample by linking workers to the firms in which they are employed. Thus we obtain a firm- shareholder-worker panel of 26 million observations with an average of 1.782 million workers per year.

To measure firm owners' portfolio diversification, we start by constructing firm-specific exchange rate shocks based on the firm's pre-existing export sales composition by country. Next, we define the firm owner's diversification as the extent to which her portfolio is insulated from the exchange rate fluctuations that hit the firm. Specifically, we measure diversification as the difference between the variance of exchange-rate-driven sales shocks at the firm level and the same variance at the level of the owner's portfolio.

[2]SMEs, defined as firms with fewer than 500 employees, comprised 89.6% of the Canadian labor force in 2017 and accounted for 85.3% of net employment growth in the years 2013- 2017 (Innovation, Science, and Economic Development Canada, 2019). In the EU, 67% of all workers were employed in firms with less than 250 employees in 2017 (Eurostat, 2020). In the United States, 47.1% of the private workforce was employed in firms with fewer than 500 employees in 2017 (U.S. Small Business Administration, 2020).

To gain intuition about this measure, consider a shareholder owning two firms that export to two different countries. As long as the exchange rates between these two countries' currencies and the Canadian dollar are not perfectly correlated, the return to the owner's portfolio will fluctuate less in response to exchange rate shocks than the returns to each of the two individual firms.

Our key finding is that diversification affects shareholders' propensity to protect their employees' jobs as well as their earnings. In our regression analysis, we estimate the extent to which firms transmit exchange rate shocks to employment and wages, and test whether this pass-through rate is reduced by diversification, in the sense that the firms owned by better diversified shareholders provide more insurance to their employees. The effect of diversification is economically and statistically significant. We first analyze the effect of diversification on the layoff rate and find that a one-standard-deviation increase in owner's diversification reduces the shock's pass-through rate to layoffs by 13%. Our results persist after controlling for firm and, importantly, owner characteristics, as well as upon including firm, industry-by-year, province-year, and owner fixed effects. This indicates that our results cannot be explained by, for example, owners' risk aversion or skills, ruling out these channels as potential alternative explanations.

To test the robustness of these results, we repeat the estimation for various subsamples. First, we focus on negative realizations of the exchange rate shocks, which obviously are those that may generate layoffs or wage cuts. While these shocks appear to strongly impact layoffs, their impact is substantially lower in firms held by diversified shareholders relative to their non-diversified counterparts, consistent with the hypothesis that owners' diversification enhances job stability in their portfolio firms. Next, we estimate our regression separately for cases in which an owner's portfolio mitigates firm's exposure to exchange rate shocks, a situation that we refer to as a "low-exposure portfolio". This reduction in exposure arises due to low correlation between the returns to the stakes held in exporting firms, or by holding stakes in non-exporting firms in addition to exporters. Finally, since a shareholder with a very large equity stake in a firm can be expected to exert greater influence on the firm's policies, we focus on the subsample of shareholders

owning at least one third of the firm's equity. Naturally, large shareholders tend to be less diversified than other shareholders of the same firms, so that focusing on them considerably reduces the variation in diversification. These two forces appear to offset each other in the estimation, as in this subsample the results are similar to those obtained in the main sample.

Turning to the provision of wage insurance, we find that the effect of owner diversification on the pass-through rate on wages is even larger than its effect on layoffs: shareholders who are one standard deviation more diversified than the average provide 41% more wage insurance to their employees. Our results are robust to controlling for worker, firm, and owner characteristics and to the inclusion of worker, firm, industry-year, province-year, and owner fixed effects. We find similar results for a sample of large shareholders who own at least one third of the firm's shares. Results are also unchanged when the analysis is restricted to "low-exposure" portfolios.

Estimating our regressions separately for negative shocks, we uncover an asymmetry: the baseline pass-through rate of the shock is not significantly different from zero, implying that a shareholder with average diversification completely insulates her employees from negative shocks. Consistent with cross-country evidence on downward wage rigidities (Holden and Wulfsberg, 2009), firms might be reluctant to cut their employees' wages in response to negative shocks. Another possible explanation is that cutting wages has undesirable effects on employee retention and morale, which owners wish to avoid because they would depress their portfolios' returns. They only reduce wages when their entire portfolio is exposed to the shock.

We investigate several mechanisms that could explain why diversified owners provide insurance to employees. First, insurance against labor income shocks might be priced in the form of lower average wages. Second, employees might resign to seek employment elsewhere if they expect to be dismissed or to suffer a pay cut when their firm suffers an adverse shock. Providing insurance may improve employee retention, reducing costly turnover. Third, terminations are costly: in Canada, workers are generally entitled to receive notice and severance pay. Age, tenure, job type, and availability of alternative employment

are factors that are generally taken into account to establish what constitutes reasonable notice and severance. We find support for the second and third mechanisms, while we do not find evidence that insurance is priced into wages. We show that turnover is lower in establishments owned by diversified owners. In addition, we examine heterogeneous effects and find that long-standing employees receive more employment insurance, consistent with these employees being harder to replace and costlier to fire.

Our work contributes to three strands of literature. The first is the recent empirical literature on risk sharing within the firm (see Pagano (2020) for a survey). Previous research has focused on possible explanations for heterogenous risk sharing: for instance, Ellul, Pagano and Schivardi (2018) document the substitutability between public employment insurance and private insurance provided by family firms; Ellul and Pagano (2019) find that highly leveraged firms place more risk on their employees, due to the higher exposure to financial distress and bankruptcy. We contribute to this strand of research by showing that shareholder diversification is a key determinant of a firm's ability to provide labor insurance that has been overlooked by previous research. We also innovate at the methodological level, by leveraging our export data to create a firm-specific, time-varying measure of exposure to exogenous exchange rate shocks, while past work has generally resorted to using macroeconomic or industry-level variables to instrument firm-level shocks.[3]

The second body of literature we contribute to is that on internal capital markets (see Almeida et al., 2015, for a review) and internal labor markets (Cestone et al., 2017; Faccio and O'Brien, 2021; Giroud and Mueller, 2015; Tate and Young, 2015) in business groups and conglomerates. This literature finds that business groups and diversified firms feature more employment stability than their standalone and focused counterparts in response to negative shocks, a result that is interpreted as evidence that firms exploit their internal labor markets to efficiently reallocate employees. Compared to this literature, we explore a novel mechanism – owners' diversification – that operates across firms with a common

[3]Example of shocks used in the literature include negative GDP growth (Faccio and O'Brien, 2021; Bena, Dinc and Erel , 2021), the introduction of new airline routes (Giroud and Mueller, 2015), or shocks to house prices (Giroud and Mueller, 2019).

owner; however, these network effects need not operate via the internal capital or labor market of a business group, with financial resources or workers being reshuffled within the group as its firms are hit by uncorrelated shocks. This is because, while the firms we study are connected by common ownership, they need not be part of a single corporate entity such as a business group: this is no minor difference, as insurance provision by a common individual shareholder need not imply either capital or labor flows across the firms concerned, and thus may go undetected if measured by these flows.

Finally, our paper complements previous work on the transmission of shocks through the economy. The literature has extensively studied financial contagion (e.g., Acemoglu, Ozdaglar and Tahbaz-Salehi, 2015; Gilje, Loutskina and Strahan, 2016) and intersectoral input– output linkages (e.g., Acemoglu et al., 2012; Caliendo et al., 2018), but the propagation of shocks through networks of firms owned by common ownership has been largely overlooked. Two exceptions are Giroud and Mueller (2019), who find that establishment-level employment is sensitive to shocks in other regions in which the firm operates, and Bena, Dinc and Erel (2021), who find that multinational companies transmit macroeconomic shocks to subsidiaries located in other countries. Both studies focus on large, listed multi-regional or multinational firms. Cross-ownership in these firm networks arises from the presence of large institutional investors, while in closely held firms the cross-ownership structure is characterized by the prevalence of individual and family shareholders, who have large stakes and are relatively undiversified. Thus, in these firms, differences in owner's diversification are likely a key driver of variation in the provision of insurance against labor income risk.

2 Diversification and Labor Income Insurance

Labor income risk is partly shared "within the firm", that is, between shareholders and employees, and partly borne by society at large through a plethora of welfare programs, among which public unemployment insurance (UI) features prominently. Government and firms act as partial substitutes in their role as insurance providers: when unemployment

benefits are more generous, firms are less reluctant to cut jobs (Ellul, Pagano and Schivardi, 2018). But the mechanisms through which public institutions and firms provide labor income insurance are different: While unemployment benefits provide ex-post financial support to displaced workers, the insurance provided by firms is an ex-ante mechanism, as firms partially insulate workers from shocks, protecting their wages and preventing them from becoming unemployed in the first place.

One may ask why labor income risk should be borne by firms or by the state rather than hedged by employees in financial markets: if workers could hedge against human capital risk by trading claims to labor income, firms would not need to shield employees from adverse shocks.[4] However, information asymmetries severely hinder financial markets' ability to provide insurance against involuntary unemployment and earnings volatility. Financial intermediaries cannot observe whether layoffs and pay cuts are caused by shirking or by firm shocks outside employees' control. In addition, workers who are aware of being at higher risk of losing their jobs or having their salary cut would be more likely to buy insurance. Since financial intermediaries cannot mandate enrolment in insurance programs, the well-established lemons argument predicts that the market would collapse. Governments partly address this market failure by sponsoring UI schemes. They are better suited to do so than financial intermediaries for at least two reasons. First, participation in public UI programs is typically mandatory, solving adverse selection. Second, the government can mitigate information frictions by mandating information disclosure, for example requiring that firms report the reason for an employee's termination.

Firms have another type of advantage vis-à-vis financial markets, namely, better information about their employees stemming from being close to them and thus capable of monitoring them, thus reducing (albeit not eliminating) the scope for moral hazard (Pagano, 2020). Indeed, with imperfect monitoring, full insurance is unviable because it would remove all incentives for employees to exert effort. Even though employees are left

[4]Workers have limited scope to hedge labor income risk via suitable portfolio choices: for instance, households rebalance their portfolio holdings when switching jobs (Betermier et al., 2012).

to bear some uncertainty related to labor income streams, much of the risk is shifted from wages to profits – that is, from employees to the firm's owners. Yet, the question remains as to why firms would tolerate increased profit volatility in order to smooth wages. The traditional view, dating back to Knight (1921), holds that insurance provision is the nature itself of the employment relationship, with agents sorting themselves into either side of this relationship depending on their attitude to risk. This idea was formalized by implicit labor contract theory, in which risk-neutral entrepreneurs hire risk-averse workers and implicitly, that is, non- contractually, commit to insulate their wages from "the vicissitudes of the business cycle" (Azariadis, 1975), in exchange for a lower wage (Baily, 1974). However, Baily emphasizes that the assumption of different risk preferences is meant to reflect a differential access to capital markets between wealthy shareholders and financially constrained workers. While workers cannot diversify their human capital risk, shareholders can diversify idiosyncratic risk, acting in the relationship with their employees as if they were risk-neutral entrepreneurs. Thus, differences in diversification are the main determinant of labor income insurance provision, which is exactly what we set to test in this paper.

3 Data

3.1 Data Sources

The main data source for this study is the Canadian Employer-Employee Dynamics Dataset (CEEDD), an administrative dataset compiled from tax records by Statistics Canada. CEEDD contains annual labor income received by each individual worker from each employer. It also reports the reason for employer-employee separations, allowing to precisely identify layoffs. This information comes from the Record of Employment (ROE), a document which employers are required to submit every time an employee experiences an interruption in earnings and is used to calculate unemployment benefits. At the individual level, CEEDD provides information on worker characteristics such as age, gender, and marital status; at the firm level, it contains financial data, location, and industry

classification.

We link CEEDD with T2 Schedule 50 (T2S50), a tax form containing information on firm ownership structure. Private firms are required to disclose the identity of all owners with a stake of 10% or more of common or preferred shares. We use this information to construct a precise measure of individual shareholders' diversification based on their ownership of different firms. The availability of ownership data in an employer-employee matched dataset is a unique feature of CEEDD and it allows us to overcome a common measurement issue in the literature, where owners are typically proxied by top earners.

Dating from 2010, CEEDD can be linked to detailed export data, reported at the firm-country-product-year level. We use these data to construct predetermined levels of export sales of firms to different countries, which we use as a measure the firms' exposure to different currencies. We then combine sales exposures of individual exporting firms to bilateral exchange rates together with exchange rate fluctuations to induce random variation in exporter-level terms of trade.

Canadian firms export to almost all countries around the world, generating large heterogeneity in the exposure to foreign currency prices. Canada's exports of goods to GDP ratios have been between 29% and 32% in our sample years (2010-17), suggesting that exchange rate movements are a major source of risk for many firms in the economy, though not for all of them. The availability of detailed data at the firm-product-country-year level allows us to capture firms' heterogeneity in exposure to exchange rate shocks.

3.2 Sample and Data Description

Our sample is comprised of Canadian-controlled for-profit private corporations and includes firm-years for which we observe at least one individual owner with a direct stake or an indirect one, i.e., a stake held via other firms. We exclude sole proprietorships and other unincorporated businesses, as well as corporations that operate in utilities, educational services, healthcare and social assistance, and public administration. In Canada, these sectors are mostly publicly funded, and thus their employment and wage policies

might be set according to social preferences rather than market forces. In addition, we require that firms appear in the sample for at least two years.

CEEDD's limitation is the lack of information on hours or weeks an employee worked. To minimize the effect of variation in hours worked and remove employees who are not strongly attached to the labor market (Song et al., 2019), we assign an employee to a firm only if the annual labor income the employee receives from that firm exceeds a threshold of one quarter (13 weeks) of full- time work at the lowest minimum wage across all provinces in that year.[5] We restrict our sample to firms with at least three employees who are not owners in one or more years.

Table 1 presents summary statistics for our sample, covering years from 2010 to 2017. Panel A tabulates firm characteristics for our panel of 3.6 million firm-shareholder-year observations with non-missing values of required variables. Since our measure of diversification is defined at the firm-shareholder-year level (as detailed in Section 4.1.2), for the sake of transparency we report firm descriptive statistics at this level of aggregation. Constructing our sample at the firm-shareholder level has the important advantage that it allows us to correctly estimate shareholder fixed effects, mitigating potential endogeneity concerns. The average firm in our sample is 18 years old, has $2.03 million worth of total assets, generates $3.04 million in sales per year, and has 2.4 owners. On average, it employs 24 workers, 14% of whom are laid off each year. The median firm is considerably smaller than the average firm in terms of assets ($0.55 million), sales ($0.94 million), and employment (7 employees). Layoff rate is also highly skewed: the median layoff rate is 0 but there are cases of massive layoffs, as shown by the fact that the 90^{th} percentile of the layoff rate is 53%.

Panel B presents descriptive statistics of worker characteristics for our sample of 27.2 million observations at the worker-firm-owner level. As in the previous panel, we choose this level of aggregation to reflect our measure of diversification, which is constructed at

[5]For example, in 2014, the Northwestern Territories had the lowest minimum wage across all provinces at 10 CAD/hour. Since a week of full- time work has 30 hours, the threshold is $10\times30\times13$=3,900. An individual who in 2014 earned more than 3,900 CAD in a firm is considered an employee of that firm.

the firm-shareholder level. The average worker is 44 years old, has been employed at the firm for 8 years (since 2001, the first year available in our employment data), and earns $51,100 per year. Earnings are, as expected, right skewed: the median employees makes $41,700 per year.

Panel C presents statistics on ownership. The firms in our sample are mostly closely held: the average shareholder owns slightly more than 50% of firm's equity, with a median of exactly 50%. Ownership structure is remarkably stable over time. Only 3.7% of firms have at least one additional owner not already present in the previous year, and only 0.8% have a new majority owner. Conversely, owners liquidate all of their shares in 4% of their firms in any given year; in 0.9% of cases, it is a majority owner who sells all of his or her shares. In the vast majority of firms, owners remain the same from one year to the next. They might still trade shares with each other and adjust their relative holdings (8.1% of firms in any given year). However, on average, the share change in the sample is very small, at 0.2%. Finally, Panel D tabulates our measure of diversification by the number of businesses owned by the shareholder. Intuitively, an owner with stakes in several firms is more diversified than an owner with a stake in a single firm only.

4 Empirical Methodology

4.1 Main Variables

4.1.1 Firm-level Export Shock

We construct our measure of idiosyncratic exogenous shock based on fluctuations in firm's exports driven by exchange rate movements. We focus on exports, rather than imports, for two reasons. First, imported goods may be inputs to the production process (affecting firms' costs) or final goods purchased for the direct consumption of domestic consumers (affecting firms' sales). Even though we have detailed data on imports, data on the use firms make of imported goods is not available. Since our diversification measure relies on sales shocks to the owner's portfolio, as detailed in Section 4.1.2, we only focus on export shocks that can affect sales.

The second reason why we abstract from import shocks is that foreign inputs may substitute for labor within the firm (Hummels et al., 2014). When the Canadian dollar depreciates, so that importing from abroad becomes more expensive for Canadian firms, firms might increase labor demand if labor and capital are substitutes in the production function. Thus, a negative import shock could actually be good news for workers, leading to wage increases and fewer layoffs. This is a concern especially in our context because Canada is a top importer of machinery (which is a good labor substitute) and a top exporter of raw materials such as oil, gas, wood, and ores (which are poor labor substitutes). Hence, we restrict our attention to exports because the effect of export shocks on labor demand is theoretically unambiguous. [6]

Our methodology is closest to Caggese, Cuñat and Metzger (2019), who use firm-specific export shocks driven by exchange rate movements as a source of exogenous variation to workers' risk of being fired. We define our shock Δe_{it} as the change in the average exchange rate faced by firm i's in its export markets: $\Delta e_{it} = \sum_c \eta_{ic\tau} \Delta E_{ct}$, where subscripts i, c, and t denote firm, country, and year, respectively.[7] The weight $\eta_{ic\tau}$ is the share of firm i's exports to country c over its total exports. To avoid endogeneity of export decisions, we use the predetermined export shares measured as the average of years $t-1$ and $t-2$ which we denote as τ.[8] Variable E_{ct} is the annual average exchange rate denoted in CAD per unit of foreign currency, so that an increase in E_{ct} represents an appreciation of country c's currency vis-à-vis the CAD. For an exporter, an appreciation of the CAD (a decrease in E_{ct}) constitutes a negative shock. Therefore, a negative shock to exporters amounts to a negative value of Δe_{it}; conversely, a positive Δe_{it} is a positive shock.

To clarify the intuition behind our strategy, consider the case of an oil producing company that exports to the U.S., such as Calgary-headquartered Canadian Natural Re-

[6] In a robustness test, we verify that our results based on export shocks are robust to controlling for import shocks.

[7] The export dataset we use reports the eight-digit commodity code (HS8) of the product and the country of destination. We aggregate exports at the firm-country-year level.

[8] Firms' export shares are stable over time. We compute the average of the previous two years to further reduce the impact of transitory year-to-year variations in firms' export shares.

sources Limited (CNRL). Fluctuations in USD/CAD exchange rate are among the major risk factors for CNRL and are included among the primary causes of net earnings volatility.[9] During our sample period, the USD/CAD exchange rate rose from below parity in 2011 to 1.3 in 2016 – a staggering 30% depreciation of the CAD, which was great news for CNLR. Between 2014 and 2015 alone, the CAD depreciated by almost 16% against the USD, but appreciated by more than 3% against the Euro, benefiting exporters to the United States and damaging exporters to countries that use the Euro as currency.

Our identification assumption is that Canadian firms are price takers in the foreign currency market and cannot readily redirect their exports across destination countries. If Canadian firms could affect currency prices or change the countries they are exporting to year-by-year at no cost, firms' owners would be able to offset each firm's exposure to exchange rate shocks and there would be no role for diversification of exchange rate shocks by holding multiple firms with different currency exposures or by holding firms that are not exporting and are thus not directly affected by such shocks.

This identification assumption is arguably satisfied. First, currency markets are large and competitive; the CAD being the 6th most traded currency in the world. Second, prior work shows that there are significant costs in terms of both time and investment for firms when they enter new export markets (Baldwin and Krugman, 1989; Das, Roberts and Tybout, 2007), suggesting that firms would not change export markets following transitory currency fluctuations that we use to construct our export shock measure.

4.1.2 Shareholders' Diversification

CEEDD does not contain complete data about individuals' financial portfolios, e.g., data about their securities and cash positions, but, via form T2S50, it includes equity investments in Canadian-controlled firms above a 10% equity ownership threshold. We therefore base our diversification measures on this firm ownership information.

[9]Page 27 of the 2017 Annual Report: https://www.cnrl.com/upload/report/93/01/cnq-2017-annual-report.pdf

In prior work on business groups, diversification has been typically measured as the number of companies under common ownership or on the basis of concentration measures such as the Herfindahl-Hirschman index and entropy. These measures are generally computed using the classification system of industry codes adopted by statistical agencies (e.g., SIC 2- or 3-digit codes).

This approach has several drawbacks (Iacobucci and Rosa, 2005), as (i) it assumes a constant distance between any two pairs of industry codes in terms of diversity, or any relevant metric that increases diversification, such as return covariance; (ii) it ignores vertical relatedness between industries (Fan and Lang, 2000); (iii) it abstracts from diversification "within" industry groups, mainly, the extent of a firm's activities in different market segments within the same product category—product differentiation and/or market segmentation strategies (Hitt, Hoskisson and Kim, 1997); and (iv) it also ignores geographical diversification (Davies, Rondi and Sembenelli, 2001).

We circumvent these shortcomings by focusing on a single precisely measurable source of risk that is relevant for many firms – foreign exchange rate risk – and measure firm-owners' diversification with respect to this risk. We should note that our definition of diversification differs from the standard definition shared by finance scholars and practitioners. Commonly, diversification is understood as a portfolio-level attribute: investors achieve portfolio diversification by allocating wealth to different asset classes, whose returns are not perfectly correlated. In general, the more assets are included in the portfolio, the more diversified the portfolio becomes.

In our setting, instead, diversification is defined at the firm-owner level, capturing the portfolio's exposure to the exchange-rate risk affecting a given firm. When the portfolio mitigates the firm's shocks, we say that the shareholder is diversified. To avoid pedantry, throughout the text we omit to specify that the shareholder is diversified *with respect to the shocks hitting the firm*, but the reader should bear this in mind. This distinction is important, because a portfolio could be composed of one exporting and one non-exporting firm. The presence of the non-exporter mitigates exchange rate shocks to the exporting firm, thus we would say that the shareholder is diversified (with respect to the exchange-

rate shocks hitting the exporter). However, from the point of view of the non-exporting firm, the portfolio increases exposure to exchange rate risk. With this caveat in mind, we proceed to detail the construction of our diversification measure.

To capture the extent to which firm i's owner j is diversified with respect to the foreign exchange rate shock affecting firm i in year t, we measure the exposure of owner j to exchange rate fluctuations through the portfolio of all the firms she owns. To this end, following the procedure described in Section 4.1.1, we first construct export shocks $\Delta e_{\iota t}$ for each firm ι that is part of the owner's portfolio. Next, we define sales shocks for firm ι as the product of the export shock and lagged sales in real terms: $\Delta \hat{s}_{\iota t} = \Delta e_{\iota t}\, sales_{\iota t-1}$.

Analogously, we construct owner's portfolio-level sales shocks $\Delta \hat{S}_{jt} = \sum_{\iota} \omega_{\iota jt}\, \Delta \hat{s}_{\iota t}$ as the weighted average of the sales shocks across firms in owner j's portfolio in year t. The weights are proportional to firm ι's importance in the owner's portfolio: $\omega_{\iota jt} = \frac{a_{\iota jt-1}}{\sum_{\iota} a_{\iota jt-1}}$, the lagged share of firm ι's assets that are owned by j over the assets owned by owner j in all firms ι in the portfolio. Finally, we compute the variance of firm ι's sales shocks and the variance of owner j's portfolio sales shocks using years from $t-4$ to t.

We define owner j's diversification as the difference between firm variance and portfolio variance: $DIV_{ijt} = VAR(\hat{s}_{it}) - VAR(\hat{S}_{jt})$. A positive (negative) difference indicates that the owner's portfolio mitigates (amplifies) the effect of an export shock to firm i. Diversification, i.e., a positive value of DIV_{ijt}, can be achieved when firms i and ι, which are part of the portfolio, export to different countries whose currencies pairs have a low or negative correlation. It can also be achieved by including in the portfolio firms that are not exporters and therefore are unaffected by exchange rates fluctuations.[10] In order to avoid scale issues, in all our empirical tests we standardize diversification to have zero mean and standard deviation of one.

An alternative measure of diversification that seems natural from an asset pricing perspective would be the correlation between firm i's sales shocks and owner j's portfolio

[10] In a robustness test, we alternatively define owner j's diversification as the ratio of one plus firm variance to one plus portfolio variance: $DIV_{ijt} = \frac{1+VAR(\hat{s}_{it})}{1+VAR(\hat{S}_{jt})}$.

sales shocks. However, such correlation does not adequately capture diversification in our context: the correlation is not defined when firm i is a non-exporter and one or more of the firms in the portfolio are exporters, because $VAR(\Delta\hat{S}_{it}) = 0$. Conversely, the correlation is equal to 1 when firm i is the only exporter in the portfolio (because firm and portfolio shocks move in tandem). The variance difference DIV_{ijt} is our preferred measure because it captures the diversification opportunity that non-exporting firms in owner j's portfolio provide for export shocks affecting firm i.

4.2 Regression Specifications

We start our analysis by examining the baseline effect of our export shock on firm outcomes, focusing on sales growth and profitability. We estimate the following firm-level regression:

$$y_{ijt} = \beta_1 \, \Delta e_{it} + X'_{it-1} \, \gamma_1 + Z'_{jt-1} \, \gamma_2 + \mu_i + \mu_j + \mu_{mt} + \mu_{pt} + \varepsilon_{ijt}, \tag{1}$$

where i, j, and t index firms, owners, and years, respectively. The dependent variable y_{it} denotes the logarithm of sales growth and profitability. The independent variable Δe_{it} is a firm's export shock described in Section 4.1.1. X_{it-1} and Z_{jt-1} are vectors of lagged firm- and owner specific time-varying control variables, respectively. μ_i denotes firm fixed effects. μ_j indicates owner fixed effects, which control for time-invariant owner's characteristics such as gender and risk aversion, as well as for corporate policies that are common to firm i and other firms in owner j's portfolio. μ_{pt} denotes province-year fixed effects which capture shocks common to all firms in a given province and year, e.g., province-specific business cycle or impacts of changes in regulatory framework in each province. μ_{mt} denotes industry-by-year fixed effects which capture industry-specific cycles. ε_{ijt} is the error term, clustered at the owner level.

After validating the export shock, we test the hypothesis that owner diversification affects a firm's propensity to provide insurance against layoffs. We estimate the following

firm-level employment regression:

$$\Delta \frac{n_{ijt}^{Layoff}}{n_{ijt}} = \beta_1 \, \Delta e_{it} + \beta_2 \, \Delta e_{it} \, DIV_{ijt} + \beta_3 \, DIV_{ijt} + X'_{it-1} \, \gamma_1 + Z'_{jt-1} \, \gamma_2 + \\ + \mu_i + \mu_j + \mu_{mt} + \mu_{pt} + \varepsilon_{ijt}. \tag{2}$$

The dependent variable is the change in the ratio of firm-initiated separations to total employment of firm i between years $t-1$ and t. We measure layoffs using the Record of Employment (ROE) filings. Specifically, we label a termination of the employer-employee relationship as "firm-initiated" when the firm reported Code A (Shortage of Work) as the reason for the separation. DIV_{ijt} is owner's diversification described in Section 4.1.2. All of the other variables are the same as in Equation (1). We cluster the error term ε_{ijt} at the owner level. Coefficient β_1 estimates the elasticity of the dismissal ratio to the export shock affecting firm i, and β_2 is the differential elasticity for a more or less diversified owner j. $\beta_2 < 0$ implies that diversification reduces the effect of the export shock on layoffs.

Next, we test whether owner diversification affects a firm's propensity to provide insurance against wage risk. We estimate the following employee-level wage regression:

$$\Delta w_{lijt} = \beta_1 \, \Delta e_{it} + \beta_2 \, \Delta e_{it} \, DIV_{ijt} + \beta_3 \, DIV_{ijt} + X'_{it-1} \, \gamma_1 + Z'_{jt-1} \, \gamma_2 + V'_{lt-1} \, \gamma_3 + \\ + \mu_i + \mu_l + \mu_{mt} + \mu_{pt} + \varepsilon_{lijt}, \tag{3}$$

where the dependent variable is the change in the log of real earnings of employee l in firm i between year $t-1$ and t. We require employees to be employed for the entire year in firm i without earnings interruptions in both $t-1$ and t. V'_{lt-1} is a vector of time-varying worker characteristics; μ_l denotes employee fixed effects; and ε_{lijt} is the stochastic component of earnings, clustered at the owner level. $\beta_2 > 0$ indicates that diversified owners reduce wages less than their undiversified counterparts in response to a negative export shock.

A skeptical reader might argue that endogeneity could arise due to omitted variables being correlated with both employment policies and shareholder's decisions to diversify her portfolio holdings across different firms. We address this concern in several ways. First, we note that ownership structure in our sample of private corporations is remarkably

stable (Table 1). Secondary markets for private company stocks are relatively illiquid; in addition, in multi-owner firms, restrictions and conditions to share transfers are common. Therefore, while we recognize that firm ownership is endogenous, in our context it is mostly a pre-determined decision as owners seldom adjust their portfolio holdings in response to idiosyncratic shocks.

Second, we include owner fixed effects so that our estimates only exploit within-owner variation, eliminating the concern that owner's time-invariant characteristics, such as her risk preferences, might drive our results. We can do so because our sample is constructed at the firm-shareholder level; therefore, we accurately measure variation driven by portfolio shocks for each shareholder over time.

Third, we control for variables that may jointly drive diversification and insurance provision. Since an owner with deep pockets might be more diversified and also in a better position to shield employees from shocks, we control for wealth using two proxies - income earned in the past 10 years and total assets owned in all firms. Similarly, a well-diversified owner may have greater ability to borrow than an undiversified one because she would be a more trustworthy borrower; this in turn would allow her to provide more insurance to the labor force. Thus, we also control for pre-existing owner's leverage, measured as the share of debts to assets owned in all firms, to account for the potential effect of borrowing capacity on risk sharing.

5 Results

We start our analysis by confirming that the idiosyncratic firm-level shocks as defined in Section 4.1.1 impact firm performance, as measured by sales growth and profitability. Panel A of Table 3 shows the results of sales growth regressions on these shocks, and Panel B and C show the results of profitability regressions. The estimates reported in Panel A indicate that sales growth respond positively and significantly to exchange rate shocks, after controlling for several firm observable characteristics that may affect sales growth, as well as for firm and industry-year fixed effects (Columns (1) - (3)) and owner

characteristics and fixed effects (Column (4)). Panels B and C show that similar results obtain for firm profitability.

5.1 Employment Insurance

The evidence in Table 3 validates our main premise that exchange rate fluctuations are exogenous shocks that firms cannot fully hedge. Absent any insurance provision by firms, these effects arising from shocks, especially negative ones, should be passed to the firm's employees. We now turn to investigate whether shareholders whose portfolios are more diversified with respect to these firm-level idiosyncratic shock provide more employment insurance.

Table 4 reports estimates of the specification in Equation (2). All regressions in the table include industry-year, firm effects and firm-level controls for company size and age, and size and age squared to control for any non-linearity effects. The specification in Column (4) also includes owner characteristics, namely, wealth measured by income in the previous 10 years and asset value (investments held in all Canadian firms), leverage (shareholders' total debt to total assets), and ownership share in the firm together with owner fixed effects. Standard errors are clustered at the owner level.

The results in Column (1) show that idiosyncratic shocks have a large impact on layoffs. The pass-through coefficient shown in the top row of Table 4 is invariably negative and significant: the baseline elasticity of employment layoffs to firm shocks ranges from 3.9% to 4.7%, depending on the specification. But in firms where the owner has high diversification the pass-through is considerably lower than in firms where the owner has a low diversification. To assess the economic significance of the estimated pass-through coefficient, we consider the most complete specification shown in column (4), which includes industry-year, firm, and owner fixed effects, as well as firm- and owner-level controls: a one-standard-deviation increase in diversification reduces the effect of the shock by 13.3%, consistent with our hypothesis that ownership diversification plays an important role in risk-sharing within firms.

The inclusion of industry-year, province-year, firm, and owner fixed effects help dispel a number of potential concerns regarding our estimates, as in principle results may be driven by unobserved firm characteristics, such as legal structure, business model or technology, impacting differentially their response to shocks. Firm fixed effects rule out this possibility. Moreover, the decision made by owners to establish their firms in certain industries that may be more exposed to idiosyncratic exchange rate shocks may also affect the results. The industry-year fixed effects rule out this possibility as well.

Finally, one could argue that owner-level characteristics, such as risk aversion and skills, could drive the results. But in so far as these characteristics are time-invariant they cannot explain the results since our specification also includes owner fixed effects. Finally, one can also rule out the possibility that shock mitigation is happening because the firm owners have access to debt markets that can be used to obtain financing during shocks and insulate workers. This is because the specification in Column (4) also controls for owners' leverage, which should proxy for her access to debt markets. The same counter-argument applies to the criticism that a deep-pocket owner may be in a better position to shield employees from shocks. Since we control for owner wealth (both at the income and the asset dimensions) we can rule out this explanation.

It is worth noting that the effects of portfolio diversification uncovered in Table 4 are not the same found by existing business group literature arising from the internal labor market, where workers are reshuffled across firms belonging to the same group. The firms in our sample need not even be part of a single legal entity.

In the Internet Appendix, we show that the main results in Table 4 are qualitatively unchanged when one relies on an alternative measure of portfolio diversification, specifically the ratio of firm variance to portfolio variance, and on alternative measures of the layoff rate. They are also robust controlling for import shocks, and to alternative clustering of the standard errors.

In Table 5, the previous analysis is repeated separately for negative and positive shocks: Columns (1)-(4) show results for positive shocks and Columns (5)-(8) for (the absolute value of) negative shocks. The effect on layoffs is, as expected, opposite in sign

in the two cases, and is much larger in absolute value for negative shocks than for positive ones: comparing the coefficient estimate in the first row of Column (4) with the respective estimate in Column (8) shows that layoffs increase in response to negative shocks over 3.2 times more than they drop in response to positive shocks. Consistent with our hypothesis, we find that the dampening effect of portfolio diversification on separations is also about twice as large for negative shocks as for positive ones.

So far we have looked at the owner's overall portfolio exposure to the shock, including both cases in which the portfolio mitigates firm shocks (i.e., firm variance is higher than portfolio variance) and cases in which the portfolio amplifies firm shocks (firm variance is lower than portfolio variance). The latter happens in the case of a non-exporting firm which gets exposed to exchange rate risk due to the inclusion of an exporter in the portfolio. In this robustness check, we focus on the former occurrence, thus isolating portfolios that provide "proper" diversification. We investigate the impact of these low-exposure portfolios in Table 6 and find results that are both statistically and economically similar to those reported in Table 4, confirming that diversification drives our results.

Next, we repeat the estimation for the subsample of shareholders with very large ownership stakes, as these can be expected to have a greater impact on firm's employment and wage policies than smaller shareholders. Table 7 shows results for owners who hold at least one third of the firm's equity in Columns (1) to (4), and for owners who hold at least one half of the firm's equity in Columns (5) to (8). The results are similar to those shown in Table 4. These results bring more precision to the mechanism at play since in these companies it is likely that the firm's employment policy is dictated either by a single owner or by a majority shareholder, without requiring coordination with other large shareholders (recall that the average firm has 2.4 shareholders).

Finally, the richness of the data in terms of workers characteristics enables us to investigate how the impact of firm-specific shocks and the mitigating influence of owners' diversification vary across workers by age, tenure, and earnings classes. Table 8 shows how the results vary across workers by age (Panel A), by tenure (Panel B), and by earnings classes (Panel C).

While the estimates in Panel A indicate that workers of all ages receive similar levels of employment insurance in response to shocks, Panel B shows that the shocks' pass-through rate on layoffs depends on their tenure in the firm. Specifically, workers who have been longer at the firm are less likely to lose their jobs and receive greater insurance relative to the shock magnitude. For example, the pass-through rate following a shock for workers that have been in the firm for less than 3 years is 4.5 times larger than that for workers with a tenure of 5 or more years. This finding squares with the fact that laying off long-standing workers is more costly for firms: they are entitled to more notice and severance, and replacing employees with a high level of firm-specific capital is more difficult. Panel C shows how the results vary across earnings classes: workers in the top tercile of the firm's earnings distribution receive the lowest amount of insurance. This may reflect the fact that these are high-skill workers for whom incentive issues are so important that it would be inefficient to give them much assurance of job stability. Alternatively, they may having valuable outside options and thus demand less insurance from their employers.

5.2 Wage Insurance

As workers are not only concerned with employment stability but also with wage stability, in this section we investigate the effect of owner's portfolio diversification on wage insurance. Table 9 reports estimates of Equation (3), where the dependent variable is the change in the logarithm of annual earnings. All regressions in the table include workers fixed effects, besides industry-year, firm effects and firm-level controls. The specifications shown in Columns (3) and (4) also include owner fixed effects. Standard errors are clustered at the owner level. Workers fixed effects are particularly important in these specifications because they absorb all worker-level unobserved characteristics, such as education, skills, etc. that may otherwise confound our effects.

The estimates in Table 9 show that foreign exchange shocks destabilize annual earnings, but owner diversification attenuates the pass-through of the shock to wages. The results in the second row shows that a one-standard-deviation increase in diversification

reduces the effect of the shock by 40.7%. Hence, the effect of owner diversification on the provision of wage insurance is greater than its effect on employment stability. Note that the inclusion of province-year fixed effects rules out that any legal or regulations requirements in the wage setting process across provinces may drive the results.

The Online Appendix reports robustness checks for the main results in Table 9, showing that its results hold when measuring diversification as the ratio of firm variance to portfolio variance, to controlling for import shocks, and to alternative clustering of the standard errors.

In Table 10 we investigate whether wages respond differently to positive and negative shocks, and whether owners' diversification affects the insurance provided by firms differently in the two cases. The baseline coefficient of the shock is not statistically different from zero in the case of negative shocks, consistent with downward wage rigidity, while it is positive and statistically significant in the case of positive shocks. Furthermore, negative shocks have zero effect on wage growth for a shareholder with average diversification, as our measure of diversification is standardized to have mean of 0 and standard deviation of 1: hence, a shareholder with average diversification completely insulates her employees from negative shocks, while owners only cut wages when their entire portfolio is sufficiently exposed to the shock. We also investigate whether our baseline results in Table 9 holds in the case of "low-exposure" portfolios. The results, shown in Table 11, are very similar to the baseline result in Table 9.

What is the effect of owner diversification on wage insurance in the case of shareholders with large stakes in the company? Table 12, where the estimation ir repeated for a subsample of large shareholders, reveals that in this subsample the mitigating effect of portfolio diversification is larger than in the estimates of Table 9: based on the most complete specification, shown in Column (4), the effect of diversification is more than 1.30 times larger when considering these owners with larger, sometimes controlling, stakes. This evidence suggests that, as expected, these dominant owners have a larger impact on wage setting.

Like employment insurance, also the provision of wage insurance by firms varies in

the cross-section of workers, depending on their age, tenure and earnings. Results in Panel A of Table 13 show that wage insurance increases with age: the coefficient estimates of the impact of the shock on wage insurance is about one third for workers in the oldest cohort (aged 51-65 years) than for those in the youngest cohort (18-34 years). Panel B shows that wage insurance decreases with tenure, so that for long-standing workers there appears to be some substitutability between employment and wage insurance: while their jobs are more protected, their earnings are not. Finally, the amount of insurance provided is similar across earnings terciles (Panel C) relative to the baseline effect of the shock, but the shock has a larger effect on wage growth for highly paid workers.

Finally, it is worth asking whether owners' portfolio diversification, by facilitating the provision of insurance against labor income risk, also translates in lower turnover rates of employees, as firms are find it easier to retain their workforce by offering them more insurance. The regression results shown in Table 14 show that indeed labor turnover is significantly lower in firms whose owners are more diversified. While this result should be taken with caution, as it could itself be affected by employment insurance provision, it is at least consistent with such provision acting as a workforce retention mechanism.

6 Conclusion

In this paper, we investigate the role that firm owners' portfolio diversification plays in the provision of insurance against labor income risk. Firm owners' ability to insulate workers from shocks depends on their own diversification. We investigate this channel using a sample of more than 524,000 Canadian private closely-held firms, documenting that owners who are more diversified due to their ownership stakes in multiple firms with uncorrelated risks provide more insurance to employees by both lowering layoffs and protecting wages during the realization of idiosyncratic shocks, especially negative ones. Our results is consistent with such insurance being provided to retain valuable human capital and avoid costly terminations. Overall, these results show the importance of owners' portfolio diversification for risk-sharing within firms.

The positive effect of diversification on insurance provision may also have a dark side, however, in the form of contagion via portfolio network effects: to absorb the adverse effect of a shock hitting one of her firms, its owners may draw resources from other firms they own – or curtail their expansion, thus spreading the adverse shock to employment and wages in these other firms. Hence, the diversified owner might make firms' wage and dismissal policies depend on idiosyncratic shocks hitting other firms in their portfolios. We leave the investigation of these potential drawbacks of diversification to future research.

References

Acemoglu, D., V. Carvalho, A. Ozdaglar, and A. Tahbaz-Salehi. 2012. Network Origins of Aggregate Fluctuations. , 1977–2016. *Econometrica 80(5)*, pp. 1977–2016.

Acemoglu, D., A. Ozdaglar, and A. Tahbaz-Salehi. 2015. Systemic risk and stability in financial networks. *American Economic Review 105(25)*, pp.564-608.

Almeida, H., C.S. Kim, and H.B. Kim. 2015. Internal capital markets in business groups: Evidence from the Asian financial crisis. *Journal of Finance 70(6)*, pp. 2539-2586.

Azariadis, C. 1975. Implicit contracts and underemployment equilibria. *Journal of political economy, 83(6)*, pp.1183-1202.

Baldwin, R. and P. Krugman. 1989. Persistent trade effects of large exchange rate shocks. The Quarterly Journal of Economics 104(4), 635-654.

Berzins, J., Ø. Bøhren, and B. Stacescu. 2019. Shareholder illiquidity and firm behavior: Financial and real effects of the personal wealth tax in private firms. ECGI Working Paper.

Betermier, S., T. Jansson, C. Parlour, and J. Walden. 2012. Hedging labor income risk. *Journal of Financial Economics 105(3)*, pp. 622-639.

Baily, M. N. 1974. Wages and employment under uncertain demand. *Review of Economic Studies 41*, p. 37–50.

Bena, J., S. Dinc, S., and I. Erel. 2021. The international propagation of economic downturns through multinational companies: The real economy channel. *Journal of Financial Economics*.

Caggese, A., V. Cuñat, and D. Metzger. 2019. Firing the wrong workers: Financing constraints and labor misallocation. *Journal of Financial Economics 133(3)*, pp. 589-607.

Caliendo, L., F. Parro, E. Rossi-Hansberg, and P.D. Sarte. 2018. The Impact of Regional and Sectoral Productivity Changes on the U.S. Economy. *Review of Economic Studies 85(4)*, pp. 2042-96.

Card, D., J. Heining, and P. Kline. 2013. Workplace heterogeneity and the rise of West German wage inequality. *Quarterly Journal of Economics 128(3)*, pp. 967-1015.

Cestone, G., C. Fumagalli, F. Kramarz, and G. Pica. 2017. Insurance between firms: the role of internal labor markets. CSEF Working Paper No. 386.

Das, S., M.J. Roberts, and J.R. Tybout. 2007. Market entry costs, producer heterogeneity, and export dynamics. *Econometrica 75(3)*, pp. 837-873.

Davies, S.W., L. Rondi, and A. Sembenelli. 2001. Are multinationality and diversification complementary or substitute strategies? An empirical analysis on European leading firms. *International Journal of Industrial Organization 19(8)*, pp. 1315-1346.

Edin, P.A. and M. Gustavsson. 2008. Time out of work and skill depreciation. *ILR Review 61(2)*, pp. 163-180.

Ellul, A. and M. Pagano. 2019. Corporate leverage and employee protection in bankruptcy. *Journal of Financial Economics 133(3)*, pp. 685-707.

Ellul, A., M. Pagano, and F. Schivardi. 2018. Employment and wage insurance within firms: worldwide evidence, *Review of Financial Studies 31(4)*, pp. 1298–1340.

Eurostat. 2020. Annual enterprise statistics by size class for special aggregates of activities (NACE Rev. 2).

Faccio, M., M.T Marchica, and R. Mura. 2011. Large shareholder diversification and corporate risk-taking. The Review of Financial Studies 24(11), 3601-3641.

Faccio M. and W. O'Brien. 2021. Business groups and employment. *Management Science 67(6)*, pp. 3468-3491.

Fan, J.P.H. and L.H.P. Lang. 2000. The measurement of relatedness: An application to corporate diversification. *The Journal of Business 73(4)*, pp. 629-660.

Gibbons, R. and L.F. Katz. 1991. Layoffs and lemons. *Journal of Labor Economics 9(4)*, 351-380.

Gilje, E.P., E. Loutskina, and P.E. Strahan. 2016. Exporting liquidity: Branch banking and financial integration. *The Journal of Finance 71(3)*, pp. 1159-1184.

Giroud, X. and H.M. Mueller. 2015. Capital and labor reallocation within firms. *Journal of Finance 70(4)*, pp. 1767-1804.

Giroud, X. and H.M. Mueller. 2019. Firms' internal networks and local economic shocks. *American Economic Review 109(10)*, pp. 3617-3649.

Guiso, L., L. Pistaferri, and F. Schivardi. 2005. Insurance within the firm. *Journal of Political Economy 113(5)*, pp. 1054-1087.

Hitt, M.A., R.E. Hoskisson, and H. Kim. 1997. International diversification: Effects on innovation and firm performance in product-diversified firms. *Academy of Management journal 40(4)*, pp. 767-798.

Holden, S. and Wulfsberg, F., 2009. How strong is the macroeconomic case for downward real wage rigidity?. *Journal of monetary Economics 56(4)*, pp. 605-615.

Hummels, D., R. Jørgensen, J. Munch, and C. Xiang. 2014. The wage effects of offshoring: Evidence from Danish matched worker-firm data. *American Economic Review 104(6)*, pp. 1597-1629.

Iacobucci, D. and P. Rosa. 2005. Growth, diversification, and business group formation in entrepreneurial firms. *Small Business Economics 25(1)*, pp. 65-82.

Innovation, Science, and Economic Development Canada. 2019. Key small business statistics.

Jacobson, L. S., R. J. LaLonde, and D. G. Sullivan. 1993. Earnings losses of displaced workers.*American Economic Review 83*, pp. 685–709.

Kalil, A. and P. Wightman. 2011. Parental job loss and children's educational attainment in black and white middle-class families. *Social Science Quarterly 92*, pp. 57–78.

Knight, F.H. 1921. Risk, uncertainty and profit. *Houghton Mifflin.*

McKee-Ryan, F.M. and R. Maitoza. 2018. Job Loss, unemployment, and families. *The Oxford handbook of job loss and job search*, pp. 259-274.

Moskowitz, T.J. and A. Vissing-Jørgensen. 2002. The returns to entrepreneurial investment: A private equity premium puzzle? *American Economic Review 92(4)*, pp. 745-778.

Pagano, M. 2020. Sharing Risk within the Firm: A Primer. *Foundations and Trends in Finance 12(2)*, pp. 117–198.

Paul, K.I., A. Hassel, and K. Moser. 2018. Individual consequences of job loss and unemployment. *Oxford handbook of job loss and job search*, pp. 57-85.

Reeves, A., D. Stuckler, M. McKee, D. Gunnell, S.S. Chang, and S. Basu. 2012. Increase in state suicide rates in the USA during economic recession. *The Lancet 380(9856)*, pp. 1813-1814.

Roelfs, D. J., E. Shor, K.W. Davidson, and J.E. Schwartz. 2011. Losing life and livelihood: A systematic review and meta-analysis of unemployment and all-cause mortality. *Social Science & Medicine 72*, pp. 840–854.

Song, J., D.J. Price, F. Guvenen, N. Bloom, and T. Von Wachter. 2019. Firming up inequality. *Quarterly journal of economics 134(1)*, pp. 1-50.

Tate, G. and L. Young. 2015. The bright side of corporate diversification: evidence from internal labor markets. *Review of Financial Studies 28(8)*, pp. 2203-2249.

U.S. Small Business Administration, Office of Advocacy. 2020. United States Small Business Profile.

Tables

Table 1: Variable Definition

Variable	Definition
Export shock Δe_{it}	Change in firm-specific average exchange rate. Specifically, $\Delta e_{it} = \sum_c \eta_{ic\tau}\, \Delta E_{ct}$, where E_ct is the annual average exchange rate between the CAD and the currency used in country c and $\eta_{ic\tau}$ is the average share of firm i's exports to country c over its total exports in years $t-1$ and $t-2$.
Owner diversification DIV_{ijt} (difference)	Difference between variance of firm sales shocks and variance of portfolio sales shocks, computed using years from $t-4$ to t: $DIV_{ijt} = VAR(\hat{s}_{it}) - VAR(\hat{S}_{jt})$. Firm i's sales shock is the product of its export shock and lagged sales: $\Delta\hat{s}_{it} = \Delta e_{it}\, sales_{it-1}$. Portfolio sales shock is the weighted average of the sales shocks of all the firms ι in owner j's portfolio: $\Delta\hat{S}_{jt} = \sum_\iota \omega_{\iota jt}\, \Delta\hat{s}_{\iota t}$. Weights are given by the lagged share of firm ι's assets that are owned by j over the assets owned by owner j in all the firms *iota*: $\omega_{\iota jt} = \frac{a_{\iota jt-1}}{\sum_\iota a_{\iota jt-1}}$. DIV_{ijt} is winsorized at 0.5% and 99.5% and standardized to have mean of zero and SD of one.
Owner diversification DIV_{ijt} (ratio)	Ratio of firm variance to portfolio variance: $DIV_{ijt} = \frac{1+VAR(\hat{s}_{\iota t})}{1+VAR(\hat{S}_{jt})}$. Portfolio variance and firm variance are defined as above. DIV_{ijt} is winsorized at 99.5% and standardized to have mean of zero and SD of one.
Layoff rate change $\Delta\frac{n_{ijt}^{Layoff}}{n_{ijt}}$	Change in the ratio of firm-initiated separations to total employment of firm i between year $t-1$ and t. Separations are firm-initiated if the employer indicated "shortage of work" as the reason for the separation.
Wage change Δw_{lijt}	Change in the logarithm of worker's real earnings between year t-1 and t. We require workers to be employed for the entire year without earnings interruptions in both years t-1 and t.
Firm size	Lagged logarithm of total assets.
Firm age	Logarithm of number of years since incorporation date. When incorporation date is missing, we use the first year in which the firm appears in the data since 2001.

Profitability	Ratio of EBITDA to total assets, winsorized at 1% and 99%. Alternatively, ratio of net income to total assets, winsorized at 1% and 99%
Sales growth	Logarithm of sales in year t minus logarithm of sales in year $t-1$, winsorized at 1% and 99%.
Wealth (income)	Lagged logarithm of total shareholder income in the previous 10 years.
Wealth (assets owned)	Lagged logarithm of total assets owned by the shareholder in all firms ι, where assets owned is the product of ownership share and firm assets.
Owner leverage	Lagged ratio of total debt to total assets owned by shareholders in all firms, winsorized at 1% and 99%.
Worker age	Logarithm of worker's age in years.
Tenure	Logarithm of number of years in which the worker has been an employee of the firm.
Import shock	Defined analogously to export shock. We use the average share of firm i's imports to country c over its total imports in years $t-1$ and $t-2$.
Ownership share	Ownership share held by the shareholder in the firm, directly or through an intermediary corporation. In the latter case, ultimate ownership is calculated as the product of shares along the ownership chain. For example, if individual A owns 50% of firm B and firm B owns 80% of firm C, then individual A owns 40% of firm C.
Turnover rate	Firm's rate of employee turnover, defined as $\frac{\text{new hires} + \text{quits} - \mid \Delta\text{employment} \mid}{\text{average employment in year } t}$, to capture hiring and quitting in excess of employment growth.

Table 2: Descriptive Statistics

This table presents descriptive statistics for our sample, comprising 3,852,904 firm-owner observations and 27,159,485 worker-firm-owner observations over years 2010-2017. Dollar values are rounded to the nearest hundred (as per Statistics Canada's rules) and expressed in 2012 dollars. Panel A tabulates summary statistics of firm characteristics at the firm-owner level. Panel B presents summary statistics of worker characteristics at the worker-firm-owner level. Panel C reports ownership characteristics, including equity shares, changes in share holding from year t to $t+1$, and dummies for shares being traded among existing owners, advent of a new owner, exit of an owner, advent of a new majority owner, and exit of a majority owner. Panel D tabulates our measure of diversification by number of firms owned; t-stat refers to the difference in diversification between owners of n and owners of $n-1$ firms.

Panel A: firm characteristics

	mean	**SD**	**p50**	**p10**	**p90**	**N**
Assets (000)	2,032.5	4,659	552.5	82.4	4,632.1	3,582,904
Sales (000)	3,044.5	6,078.4	943.7	163.3	7,294.6	3,582,904
Firm age	17.8	11.9	15	5	40	3,582,904
Number of employees	24.3	377.7	7	2	42	3,582,904
Layoff rate	0.14	0.26	0	0	0.53	3,582,904
Number of owners	2.4	2.7	2	1	4	3,582,904

Panel B: worker characteristics

	mean	**SD**	**p50**	**p10**	**p90**	**N**
Age	43.8	13.2	45	25	60	27,159,485
Tenure	7.7	4.1	7	3	14	27,159,485
Earnings (yearly, 000)	51.1	74.1	41.7	13.4	90.8	27,159,485

Panel C: ownership

	mean	**SD**	**p50**	**p10**	**p90**	**N**
Ownership share	0.53	0.32	0.5	0.125	1	3,582,904
Share change	-.002	8.2	0	0	0	4,260,127
		Frequency		**Percent**		**N**
Share transactions among owners		248,360		8.07		3,079,124
New owner entry		114,880		3.73		3,079,124
New majority owner entry		24,791		0.81		3,079,124
Old owner exit		122,628		3.98		3,079,124
Old majority owner exit		28,590		0.93		3,079,124

Panel D: diversification

Number of firms owned	**mean**	**SD**	**t-stat**	**N**
1	0.0957	54.17		1,566,016
2	9.999	203.12	46.38***	943,831
3	28.64	348.42	33.10***	443,927
4	47.08	494.61	15.72***	221,850
≥ 5	72.35	770.26	15.80***	407,280

Table 3: Effect of diversification on firm outcomes

This table examines the effect of the exchange rate export shocks on firm outcomes, reporting estimates of Equation (1). Panel A reports the effect on sales growth. Panel B and C report the effect on profitability, measured as the ratio of EBITDA to assets and net income to assets respectively. Firm control variables include lagged log of assets, lagged log of assets squared, log of age, and log of age squared. Owner control variables include lagged wealth (as proxied by the log of total income in the previous 10 years and log of assets owned in all firms), lagged owner's leverage, and ownership share. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Sales growth

	(1)	(2)	(3)	(4)
Shock	6.321***	4.185***	6.058***	5.560***
	(1.097)	(1.087)	(1.112)	(1.143)
Firm size	-23.33***	-23.50***	-22.76***	-26.18***
	(0.639)	(0.641)	(0.664)	(0.791)
Firm size squared	0.319***	0.332***	0.281***	0.422***
	(0.025)	(0.025)	(0.026)	(0.031)
Firm age	-207.2***	-209.1***	-210.1***	-205.8***
	(0.769)	(0.771)	(0.785)	(0.814)
Firm age squared	64.10***	65.33***	65.48***	64.55***
	(0.290)	(0.291)	(0.298)	(0.306)
Wealth (income)				-2.968***
				(0.117)
Wealth (assets owned)				-0.670***
				(0.055)
Owner leverage				-1.492***
				(0.050)
Ownership share				-0.238
				(0.253)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.445	0.449	0.445	0.444
Number of observations	4,591,092	4,590,898	4,536,205	4,184,170

Panel B: Profitability $\left(\frac{EBITDA}{assets}\right)$

	(1)	(2)	(3)	(4)
Shock	5.455***	5.698***	4.270**	4.736***
	(1.744)	(1.757)	(1.761)	(1.793)
Firm size	18.22***	18.29***	18.65***	23.70***
	(0.766)	(0.766)	(0.778)	(0.801)
Firm size squared	-2.238***	-2.242***	-2.229***	-2.258***
	(0.032)	(0.032)	(0.033)	(0.034)
Firm age	121.4***	121.2***	120.9***	111.0***
	(1.630)	(1.633)	(1.685)	(1.727)
Firm age squared	-34.01***	-33.85***	-34.06***	-31.30***
	(0.642)	(0.645)	(0.668)	(0.683)
Wealth (income)				0.886***
				(0.333)
Wealth (assets owned)				-2.146***
				(0.166)
Owner leverage				10.77***
				(0.263)
Ownership share				5.033***
				(0.763)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.834	0.835	0.839	0.844
Number of observations	5,024,007	5,023,775	4,970,861	4,591,972

Panel C: Profitability $\left(\frac{Net\ income}{assets}\right)$

	(1)	(2)	(3)	(4)
Shock	8.686***	8.189***	8.309***	8.361***
	(0.733)	(0.734)	(0.743)	(0.759)
Firm size	3.767***	3.793***	3.857***	4.966***
	(0.196)	(0.196)	(0.201)	(0.220)
Firm size squared	-0.345***	-0.347***	-0.353***	-0.359***
	(0.009)	(0.009)	(0.009)	(0.010)
Firm age	14.79***	13.85***	14.98***	12.92***
	(0.440)	(0.439)	(0.456)	(0.471)
Firm age squared	-4.989***	-4.359***	-5.045***	-4.264***
	(0.175)	(0.175)	(0.182)	(0.188)
Wealth (income)				-2.679***
				(0.100)
Wealth (assets owned)				-0.203***
				(0.044)
Owner leverage				2.801***
				(0.074)
Ownership share				-0.697***
				(0.211)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.599	0.601	0.606	0.615
Number of observations	5,024,013	5,023,781	4,970,867	4,591,977

Table 4: Effect of diversification on employment insurance

This table examines the effect of owner diversification on the layoff rate in response to firm-level exchange rate shocks, reporting estimates of Equation (2). The dependent variable is the change in the ratio of layoffs to total employment. Owner diversification is the difference between firm variance and owner's portfolio variance, standardized to have mean of zero and standard deviation of one. Firm control variables include size, size squared, age, and age squared. Firm size is measured as the lagged logarithm of total assets; firm age is measured as the logarithm of number of years since incorporation. Owner control variables include wealth, owner's leverage, and ownership share. Wealth is proxied by the lagged logarithm of total income reported by the owner in the previous 10 years and by the lagged logarithm of assets owned in all firms, where assets owned are calculated as the product of firm assets and ownership share. Owner's leverage is measured as the lagged ratio of total debt to total assets owned in all firms. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	-4.670***	-3.901***	-4.540***	-4.421***
	(0.639)	(0.636)	(0.652)	(0.674)
Shock × Diversification	0.614***	0.510***	0.610***	0.590***
	(0.092)	(0.091)	(0.095)	(0.098)
Diversification	-0.0647***	-0.0610***	-0.0728***	-0.0671***
	(0.008)	(0.008)	(0.010)	(0.010)
Firm size	-2.045***	-1.928***	-2.094***	-1.630***
	(0.244)	(0.243)	(0.255)	(0.274)
Firm size squared	0.110***	0.102***	0.113***	0.0960***
	(0.009)	(0.009)	(0.010)	(0.010)
Firm age	1.419***	1.743***	1.549***	1.338***
	(0.397)	(0.397)	(0.418)	(0.432)
Firm age squared	-0.313**	-0.490***	-0.359**	-0.314**
	(0.140)	(0.141)	(0.148)	(0.153)
Wealth (income)				-0.196***
				(0.058)
Wealth (assets owned)				0.140***
				(0.034)
Owner leverage				0.143***
				(0.029)
Ownership share				-0.367***
				(0.133)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.129	0.130	0.110	0.112
Number of observations	3,870,297	3,870,130	3,794,227	3,582,904

Table 5: Effect of diversification on employment insurance, positive vs. negative shocks

This table examines the effect of owner diversification on the layoff rate in response to firm-level positive and negative exchange rate shocks. The dependent variable is the change in the ratio of layoffs to total employment. A positive shock is equal to Δe_{it} if $\Delta e_{it} > 0$ and zero otherwise. A negative shock is equal to $\mid \Delta e_{it} \mid$ if $\Delta e_{it} < 0$ and zero otherwise.Columns (1) to (4) report the estimates of Equation (2) for positive shocks. Column (5) to (8) report the effect of negative shocks. Control variables are as described in Table 4. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Positive shocks				**Negative shocks**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Shock	-4.626***	-3.814***	-4.522***	-4.358***	14.51***	12.72***	13.88***	14.08***
	(0.711)	(0.707)	(0.726)	(0.751)	(2.637)	(2.635)	(2.705)	(2.776)
Shock × Diversification	0.669***	0.557***	0.665***	0.637***	-1.230***	-0.950**	-1.247**	-1.328***
	(0.103)	(0.102)	(0.107)	(0.110)	(0.476)	(0.472)	(0.502)	(0.511)
Diversification	-0.0721***	-0.0675***	-0.0802***	-0.0739***	-0.0409***	-0.0420***	-0.0502***	-0.0446***
	(0.009)	(0.009)	(0.011)	(0.011)	(0.008)	(0.008)	(0.009)	(0.009)
Firm size	-2.046***	-1.928***	-2.095***	-1.631***	-2.033***	-1.918***	-2.085***	-1.621***
	(0.244)	(0.243)	(0.255)	(0.274)	(0.243)	(0.243)	(0.255)	(0.274)
Firm size squared	0.110***	0.102***	0.113***	0.0960***	0.110***	0.102***	0.113***	0.0955***
	(0.009)	(0.009)	(0.010)	(0.010)	(0.009)	(0.009)	(0.010)	(0.010)
Firm age	1.416***	1.740***	1.545***	1.334***	1.405***	1.731***	1.534***	1.324***
	(0.397)	(0.397)	(0.418)	(0.432)	(0.397)	(0.397)	(0.418)	(0.432)
Firm age squared	-0.312**	-0.489***	-0.357**	-0.313**	-0.309**	-0.487***	-0.355**	-0.310**
	(0.140)	(0.141)	(0.148)	(0.153)	(0.140)	(0.141)	(0.148)	(0.153)
Wealth (income)				-0.195***				-0.196***
				(0.034)				(0.034)
Wealth (assets owned)				0.140***				0.140***
				(0.058)				(0.058)
Owner leverage				0.143***				0.143***
				(0.029)				(0.029)
Ownership share				-0.368***				-0.367***
				(0.133)				(0.133)
Industry × year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes	No	No	Yes	Yes
R^2	0.129	0.130	0.110	0.112	0.129	0.130	0.110	0.112
Number of observations	3,870,297	3,870,130	3,794,227	3,582,904	3,870,297	3,870,130	3,794,227	3,582,904

Table 6: Effect of diversification on employment insurance, low-exposure portolios

This table examines the effect of owner diversification on the layoff rate in response to firm-level exchange rate shocks, focusing on the case in which low exposure mitigates the effect of the shock. The dependent variable is the change in the ratio of layoffs to total employment. Diversification is equal to DIV_{ijt} if $DIV_{ijt} > 0$ and 0 otherwise. Control variables are as described in Table 4. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	-4.724***	-3.945***	-4.598***	-4.478***
	(0.643)	(0.640)	(0.656)	(0.677)
Shock × Diversification	0.640***	0.532***	0.639***	0.621***
	(0.092)	(0.091)	(0.095)	(0.098)
Diversification	-0.0691***	-0.0651***	-0.0781***	-0.0728***
	(0.008)	(0.008)	(0.010)	(0.010)
Firm size	-2.048***	-1.931***	-2.098***	-1.635***
	(0.244)	(0.243)	(0.255)	(0.274)
Firm size squared	0.110***	0.103***	0.114***	0.0962***
	(0.009)	(0.009)	(0.010)	(0.010)
Firm age	1.421***	1.744***	1.550***	1.340***
	(0.397)	(0.397)	(0.418)	(0.432)
Firm age squared	-0.314**	-0.491***	-0.360**	-0.315**
	(0.140)	(0.141)	(0.148)	(0.153)
Wealth (income)				-0.196***
				(0.058)
Wealth (assets owned)				0.141***
				(0.034)
Owner leverage				0.143***
				(0.029)
Ownership share				-0.368***
				(0.133)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.129	0.130	0.110	0.112
Number of observations	3,870,297	3,870,130	3,794,227	3,582,904

Table 7: Effect of diversification on employment insurance, large shareholders

This table examines the effect of owner diversification on the layoff rate in response to firm-level rate shocks for a subsample of large shareholders. The dependent variable is the change in the ratio of layoffs to total employment. Columns (1) to (4) report estimates for shareholders who own 33.3% or more of firm shares. Column (5) to (8) report estimates for shareholders who own 50% or more of firm shares. Control variables are as described in Table 4. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Ownership ≥ 33.3%				**Ownership ≥ 50%**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Shock	-4.361***	-3.299***	-4.267***	-4.252***	-3.890***	-2.853**	-3.815***	-3.896***
	(0.973)	(0.969)	(0.985)	(1.018)	(1.121)	(1.117)	(1.133)	(1.172)
Shock × Diversification	0.619***	0.569***	0.643***	0.681***	0.529***	0.491***	0.530***	0.579***
	(0.133)	(0.132)	(0.136)	(0.138)	(0.148)	(0.147)	(0.150)	(0.153)
Diversification	-0.0786***	-0.0768***	-0.0863***	-0.0847***	-0.0727***	-0.0694***	-0.0769***	-0.0770***
	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)
Firm size	-1.868***	-1.736***	-1.884***	-1.534***	-1.706***	-1.565***	-1.674***	-1.247***
	(0.332)	(0.332)	(0.341)	(0.381)	(0.353)	(0.352)	(0.360)	(0.399)
Firm size squared	0.103***	0.0939***	0.104***	0.0865***	0.0952***	0.0862***	0.0949***	0.0730***
	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)
Firm age	1.346**	1.708***	1.540***	1.459**	1.676***	2.016***	1.802***	1.709***
	(0.546)	(0.547)	(0.565)	(0.586)	(0.609)	(0.610)	(0.627)	(0.651)
Firm age squared	-0.281	-0.475**	-0.354*	-0.370*	-0.405*	-0.591***	-0.466**	-0.491**
	(0.196)	(0.196)	(0.203)	(0.210)	(0.219)	(0.220)	(0.226)	(0.235)
Wealth (income)				-0.210**				-0.184**
				(0.083)				(0.091)
Wealth (assets owned)				0.298***				0.337***
				(0.056)				(0.063)
Owner leverage				0.141***				0.154***
				(0.035)				(0.037)
Ownership share				-0.508**				-0.598**
				(0.221)				(0.262)
Industry × year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes	No	No	Yes	Yes
R^2	0.119	0.120	0.102	0.104	0.116	0.117	0.101	0.103
Number of observations	2,581,375	2,581,274	2,536,439	2,394,758	2,240,804	2,240,717	2,205,628	2,079,815

Table 8: Effect of diversification on employment insurance, heterogeneity

This table examines the effect of owner diversification on the layoff rate in response to firm-level exchange rate shocks, analyzing heterogeneous effects. The dependent variable is the change in the ratio of layoffs to total employment, calculated separately for each group. Panel A reports estimates for three separate age groups: workers who are between 18 and 34, 35 and 50, and 51 and 65 years of age. Panel B reports estimates for workers who have been at the firm for less than 3 years, between 3 and 5 years, and more than 5 years, respectively. Panel C reports estimates for workers who belong to the first, second, and third tercile of the firm's earnings distribution, respectively. Belonging to a given tercile is assigned based on previous year earnings, with the requirement that the worker did not experience any earnings interruption in the previous year. Control variables are as described in Table 4. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: age

	Age 18-34		**Age 35-50**		**Age 51-65**	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock	-4.375***	-4.303***	-2.756***	-2.644***	-3.666***	-3.022***
	(0.928)	(0.956)	(0.881)	(0.904)	(1.025)	(1.053)
Shock × Diversification	0.623***	0.643***	0.403***	0.356***	0.484***	0.430***
	(0.131)	(0.135)	(0.115)	(0.118)	(0.135)	(0.138)
Diversification	-0.0781***	-0.0771***	-0.0648***	-0.0565***	-0.0772***	-0.0768***
	(0.013)	(0.014)	(0.012)	(0.012)	(0.014)	(0.014)
Firm size	-2.835***	-2.419***	-2.245***	-1.999***	-2.894***	-2.288***
	(0.35)	(0.375)	(0.398)	(0.411)	(0.426)	(0.449)
Firm size squared	0.143***	0.128***	0.113***	0.103***	0.132***	0.109***
	(0.013)	(0.014)	(0.014)	(0.015)	(0.015)	(0.016)
Firm age	1.631***	1.279**	3.625***	3.516***	2.709***	2.471***
	(0.557)	(0.575)	(0.623)	(0.639)	(0.744)	(0.763)
Firm age squared	-0.362*	-0.268	-1.161***	-1.166***	-0.820***	-0.759***
	(0.203)	(0.209)	(0.217)	(0.223)	(0.254)	(0.260)
Wealth (income)		-0.173**		-0.0598		-0.034
		(0.078)		(0.082)		(0.099)
Wealth (assets owned)		0.0913**		0.111**		0.204***
		(0.045)		(0.047)		(0.054)
Owner leverage		0.124***		0.144***		0.226***
		(0.04)		(0.046)		(0.057)
Ownership share		-0.117		-0.139		-0.562***
		(0.182)		(0.189)		(0.217)
Industry × year effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Owner effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.119	0.120	0.133	0.135	0.134	0.136
Number of observations	2,932,598	2,773,337	2,701,752	2,561,686	2,279,649	2,168,459

Panel B: tenure

	Tenure < 3 years		**3 years ≤ Tenure ≤ 5 years**		**Tenure > 5 years**	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock	-6.332***	-6.353***	-3.896***	-3.450***	-1.688**	-1.417*
	(1.080)	(1.119)	(1.098)	(1.131)	(0.739)	(0.759)
Shock × Diversification	0.693***	0.706***	0.500***	0.439***	0.301***	0.290***
	(0.153)	(0.158)	(0.144)	(0.148)	(0.100)	(0.102)
Diversification	-0.0557***	-0.0481***	-0.0454***	-0.0414***	-0.0469***	-0.0455***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.010)	(0.010)
Firm size	-3.005***	-2.380***	-2.727***	-2.070***	-1.391***	-0.903**
	(0.334)	(0.350)	(0.404)	(0.417)	(0.333)	(0.352)
Firm size squared	0.165***	0.142***	0.152***	0.126***	0.0751***	0.0551***
	(0.012)	(0.013)	(0.015)	(0.015)	(0.012)	(0.013)
Firm age	2.801***	2.622***	3.744***	3.652***	1.963**	1.948**
	(0.584)	(0.608)	(0.899)	(0.922)	(0.827)	(0.850)
Firm age squared	-0.727***	-0.679***	-0.806***	-0.800***	-0.294	-0.319
	(0.221)	(0.229)	(0.299)	(0.306)	(0.235)	(0.242)
Wealth (income)		-0.209**		0.151		-0.130
		(0.082)		(0.094)		(0.082)
Wealth (assets owned)		0.164***		0.219***		0.217***
		(0.049)		(0.054)		(0.043)
Owner leverage		0.210***		0.222***		0.217***
		(0.044)		(0.053)		(0.043)
Ownership share		0.0922		-0.275		-0.889***
		(0.201)		(0.218)		(0.171)
Industry × year effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Owner effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.125	0.127	0.141	0.142	0.118	0.119
Number of observations	2,879,999	2,714,048	2,455,623	2,324,839	2,411,765	2,298,362

Panel C: earnings

	Bottom Tercile		**Middle Tercile**		**Top Tercile**	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock	-2.940***	-2.646**	-2.976***	-2.794***	-3.052***	-2.817***
	(1.028)	(1.060)	(0.916)	(0.941)	(0.747)	(0.758)
Shock × Diversification	0.568***	0.551***	0.388***	0.341***	0.173*	0.124
	(0.151)	(0.154)	(0.127)	(0.130)	(0.097)	(0.098)
Diversification	-0.0910***	-0.0879***	-0.0690***	-0.0608***	-0.0503***	-0.0471***
	(0.016)	(0.016)	(0.013)	(0.013)	(0.010)	(0.010)
Firm size	-4.674***	-4.159***	-4.629***	-3.870***	-3.756***	-3.040***
	(0.451)	(0.465)	(0.429)	(0.435)	(0.423)	(0.424)
Firm size squared	0.192***	0.174***	0.180***	0.156***	0.125***	0.103***
	(0.016)	(0.017)	(0.015)	(0.016)	(0.015)	(0.015)
Firm age	5.439***	4.912***	6.829***	6.475***	6.201***	5.795***
	(0.951)	(0.979)	(0.801)	(0.819)	(0.747)	(0.763)
Firm age squared	-1.290***	-1.119***	-1.700***	-1.583***	-1.370***	-1.258***
	(0.302)	(0.311)	(0.255)	(0.261)	(0.236)	(0.241)
Wealth (income)		-0.152		-0.071		-0.175**
		(0.095)		(0.084)		(0.077)
Wealth (assets owned)		0.130**		0.0469		-0.00907
		(0.052)		(0.048)		(0.043)
Owner leverage		0.279***		0.388***		0.367***
		(0.053)		(0.053)		(0.051)
Ownership share		-0.679***		-0.177		-0.414**
		(0.208)		(0.193)		(0.170)
Industry × year effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Owner effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.131	0.132	0.145	0.147	0.160	0.161
Number of observations	1,812,288	1,724,294	1,844,338	1,754,353	1,858,204	1,767,303

Table 9: Effect of diversification on wage insurance

This table examines the effect of owner diversification on wage growth in response to firm-level exchange rate shocks, reporting estimates of Equation (3). The dependent variable is the change in the logarithm of yearly earnings. Workers who were employed the entire year in t or $t-1$ are included in the sample. Owner diversification is the difference between firm variance and owner's portfolio variance, standardized to have mean of zero and standard deviation of one. Worker control variables includes age (logarithm of years), age squared, tenure (logarithm of years at the firm), and tenure squared. Firm control variables include size, size squared, age, and age squared. Size is measured as the lagged logarithm of total assets; age is measured as the logarithm of number of years since incorporation. Owner control variables include wealth, owner's leverage, and ownership share. Wealth is proxied by the lagged logarithm of total income reported by the owner in the previous 10 years and by the lagged logarithm of assets owned in all firms, where assets owned are calculated as the product of firm assets and ownership share. Owner's leverage is measured as the lagged ratio of total debt to total assets owned in all firms. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	4.150***	3.790***	4.379***	4.152***
	(0.753)	(0.746)	(0.717)	(0.722)
Shock × Diversification	-1.795***	-1.661***	-1.887***	-1.690***
	(0.296)	(0.292)	(0.322)	(0.296)
Diversification	0.191***	0.198***	0.206***	0.225***
	(0.032)	(0.031)	(0.042)	(0.041)
Tenure	-39.19***	-38.96***	-39.32***	-38.89***
	(0.760)	(0.756)	(0.768)	(0.793)
Tenure squared	8.656***	8.585***	8.683***	8.586***
	(0.226)	(0.225)	(0.228)	(0.236)
Age	-454.0***	-456.7***	-450.0***	-446.4***
	(16.501)	(16.451)	(16.515)	(16.763)
Age squared	80.27***	81.00***	79.60***	78.98***
	(3.114)	(3.105)	(3.115)	(3.165)
Firm size	0.532	1.449***	1.089**	0.658
	(0.389)	(0.385)	(0.543)	(0.516)
Firm size squared	-0.0201	-0.0520***	-0.0399**	-0.0271
	(0.014)	(0.014)	(0.020)	(0.019)
Firm age	7.651***	7.060***	8.092***	8.066***
	(0.841)	(0.777)	(0.859)	(0.877)
Firm age squared	-1.578***	-1.146***	-1.772***	-1.657***
	(0.267)	(0.248)	(0.274)	(0.279)
Wealth (income)				-1.156***
				(0.091)
Wealth (assets owned)				0.0279
				(0.051)
Owner leverage				-0.316***
				(0.049)
Ownership share				0.906***
				(0.255)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.468	0.469	0.469	0.469
Number of observations	28,448,358	28,446,663	28,407,689	27,159,485

Table 10: Effect of diversification on wage insurance, positive vs. negative shocks

This table examines the effect of owner diversification on wage growth in response to firm-level positive and negative exchange rate shocks. The dependent variable is the change in the logarithm of yearly earnings. A positive shock is equal to Δe_{it} if $\Delta e_{it} > 0$ and zero otherwise. A negative shock is equal to $\mid \Delta e_{it} \mid$ if $\Delta e_{it} < 0$ and zero otherwise.Columns (1) to (4) report the estimates of Equation (2) for positive shocks. Column (5) to (8) report the effect of negative shocks. Control variables are as described in Table 9. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Positive shocks			
	(1)	(2)	(3)	(4)
Shock	4.877***	4.435***	5.085***	4.840***
	(0.852)	(0.847)	(0.815)	(0.824)
Shock × Diversification	-2.001***	-1.838***	-2.118***	-1.904***
	(0.332)	(0.329)	(0.367)	(0.336)
Diversification	0.216***	0.220***	0.232***	0.249***
	(0.034)	(0.033)	(0.044)	(0.043)
Tenure	-39.19***	-38.96***	-39.33***	-38.89***
	(0.760)	(0.756)	(0.768)	(0.793)
Tenure squared	8.658***	8.587***	8.685***	8.587***
	(0.226)	(0.225)	(0.228)	(0.236)
Age	-453.9***	-456.7***	-450.0***	-446.4***
	(16.503)	(16.453)	(16.517)	(16.765)
Age squared	80.26***	81.00***	79.60***	78.98***
	(3.114)	(3.106)	(3.115)	(3.165)
Firm size	0.517	1.437***	1.086**	0.656
	(0.387)	(0.383)	(0.543)	(0.515)
Firm size squared	-0.0196	-0.0516***	-0.0398**	-0.0270
	(0.014)	(0.014)	(0.020)	(0.019)
Firm age	7.659***	7.067***	8.094***	8.067***
	(0.842)	(0.777)	(0.859)	(0.877)
Firm age squared	-1.581***	-1.148***	-1.773***	-1.657***
	(0.267)	(0.248)	(0.274)	(0.279)
Wealth (income)				-1.157***
				(0.091)
Wealth (assets owned)				0.0284
				(0.051)
Owner leverage				-0.316***
				(0.049)
Ownership share				0.905***
				(0.254)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.468	0.469	0.469	0.469
Number of observations	28,448,358	28,446,663	28,407,689	27,159,485

	Negative shocks			
	(5)	(6)	(7)	(8)
Shock	-2.763	-2.758	-3.748	-3.395
	(2.934)	(2.811)	(3.025)	(3.072)
Shock × Diversification	6.876***	6.772***	6.331***	5.470***
	(1.814)	(1.736)	(1.726)	(1.771)
Diversification	0.0237	0.0397	0.0362	0.0765*
	(0.034)	(0.033)	(0.050)	(0.045)
Tenure	-39.18***	38.94***	-39.31***	-38.88***
	(0.759)	(0.755)	(0.768)	(0.793)
Tenure squared	8.653***	8.582***	8.680***	8.583***
	(0.226)	(0.225)	(0.228)	(0.236)
Age	-455.1***	-457.7***	-451.1***	-447.4***
	(16.494)	(16.45)	(16.51)	(16.76)
Age squared	80.48***	81.19***	79.80***	79.16***
	(3.113)	(3.104)	(3.113)	(3.163)
Firm size	0.550	1.467***	1.050*	0.618
	(0.400)	(0.394)	(0.545)	(0.520)
Firm size squared	-0.021	-0.053***	-0.038*	-0.025
	(0.015)	(0.014)	(0.020)	(0.019)
Firm age	7.633***	7.046***	8.090***	8.064***
	(0.844)	(0.780)	(0.864)	(0.881)
Firm age squared	-1.566***	-1.136***	-1.773***	-1.657***
	(0.267)	(0.248)	(0.276)	(0.280)
Wealth (income)				-1.155***
				(0.092)
Wealth (assets owned)				0.025
				(0.051)
Owner leverage				-0.317***
				(0.049)
Ownership share				0.929***
				(0.262)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.468	0.469	0.469	0.469
Number of observations	28,448,358	28,446,663	28,407,689	27,159,485

Table 11: Effect of diversification on wage insurance, low-exposure portfolios
This table examines the effect of owner diversification on wage growth in response to firm-level exchange rate shocks, focusing on the case in which low exposure mitigates the effect of the shock. The dependent variable is the change in the logarithm of yearly earnings. Diversification is equal to DIV_{ijt} if $DIV_{ijt} > 0$ and 0 otherwise. All coefficients and standard errors are multiplied by 100 for the sake of readability. Control variables are as described in Table 9. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	4.306***	3.928***	4.498***	4.266***
	(0.747)	(0.741)	(0.711)	(0.718)
Shock × Diversification	-1.938***	-1.779***	-1.970***	-1.780***
	(0.296)	(0.292)	(0.316)	(0.293)
Diversification	0.216***	0.217***	0.213***	0.234***
	(0.034)	(0.032)	(0.043)	(0.042)
Tenure	-39.19***	-38.96***	-39.32***	-38.89***
	(0.760)	(0.755)	(0.768)	(0.793)
Tenure squared	8.657***	8.586***	8.684***	8.586***
	(0.226)	(0.225)	(0.228)	(0.236)
Age	-453.7***	-456.5***	-449.8***	-446.2***
	(16.499)	(16.450)	(16.510)	(16.757)
Age squared	80.21***	80.95***	79.57***	78.95***
	(3.113)	(3.105)	(3.114)	(3.164)
Firm size	0.569	1.483***	1.093**	0.659
	(0.390)	(0.386)	(0.544)	(0.519)
Firm size squared	-0.0215	-0.0533***	-0.0400**	-0.0271
	(0.014)	(0.014)	(0.020)	(0.019)
Firm age	7.660***	7.067***	8.099***	8.076***
	(0.839)	(0.776)	(0.858)	(0.876)
Firm age squared	-1.581***	-1.149***	-1.775***	-1.661***
	(0.266)	(0.247)	(0.274)	(0.279)
Wealth (income)				-1.157***
				(0.091)
Wealth (assets owned)				0.0268
				(0.051)
Owner leverage				-0.316***
				(0.049)
Ownership share				0.907***
				(0.254)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.468	0.469	0.469	0.469
Number of observations	28,448,358	28,446,663	28,407,689	27,159,485

Table 12: Effect of diversification on wage insurance, large shareholders

This table examines the effect of owner diversification on wage growth in response to firm-level exchange rate shocks, for a subsample of large shareholders. The dependent variable is the change in the logarithm of yearly earnings. Columns (1) to (4) report estimates for shareholders who own 33.3% or more of firm shares. Column (5) to (8) report estimates for shareholders who own 50% or more of firm shares. Control variables are as described in Table 9. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Ownership $\geq$ 33.3%			
	(1)	(2)	(3)	(4)
Shock	5.557***	4.468***	5.417***	4.733***
	(0.966)	(0.956)	(0.972)	(0.948)
Shock × Diversification	-2.814***	-2.685***	-2.698***	-2.270***
	(0.703)	(0.707)	(0.795)	(0.653)
Diversification	0.279***	0.271***	0.222***	0.258***
	(0.068)	(0.063)	(0.081)	(0.073)
Tenure	-43.70***	-43.50***	-43.69***	-43.14***
	(0.613)	(0.611)	(0.615)	(0.638)
Tenure squared	9.647***	9.598***	9.646***	9.518***
	(0.205)	(0.205)	(0.206)	(0.215)
Age	-291.9***	-292.8***	-289.3***	-288.8***
	(18.517)	(18.484)	(18.592)	(18.892)
Age squared	47.84***	48.27***	47.35***	47.38***
	(3.539)	(3.533)	(3.556)	(3.615)
Firm size	3.092***	3.114***	3.724***	2.922***
	(0.635)	(0.626)	(0.654)	(0.689)
Firm size squared	-0.108***	-0.107***	-0.131***	-0.0956***
	(0.025)	(0.024)	(0.025)	(0.027)
Firm age	8.184***	7.230***	8.170***	8.088***
	(1.220)	(1.104)	(1.241)	(1.275)
Firm age squared	-1.676***	-1.182***	-1.726***	-1.434***
	(0.404)	(0.370)	(0.417)	(0.428)
Wealth (income)				-1.916***
				(0.156)
Wealth (assets owned)				-0.388***
				(0.089)
Owner leverage				-0.368***
				(0.063)
Ownership share				0.474
				(0.405)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.427	0.427	0.426	0.425
Number of observations	11,450,169	11,449,944	11,424,611	10,856,676

	Ownership $\geq$ 50%			
	(5)	(6)	(7)	(8)
Shock	5.572***	4.233***	5.620***	4.851***
	(1.103)	(1.095)	(1.105)	(1.072)
Shock × Diversification	-2.432***	-2.213***	-2.362***	-2.287***
	(0.747)	(0.755)	(0.833)	(0.857)
Diversification	0.303***	0.271***	0.245***	0.222**
	(0.077)	(0.074)	(0.090)	(0.093)
Tenure	-44.68***	-44.50***	-44.70***	-44.12***
	(0.675)	(0.672)	(0.678)	(0.705)
Tenure squared	9.801***	9.757***	9.828***	9.696***
	(0.238)	(0.238)	(0.238)	(0.249)
Age	-244.8***	-245.4***	-243.3***	-241.7***
	(20.094)	(20.056)	(20.187)	(20.499)
Age squared	38.50***	38.90***	38.23***	38.08***
	(3.851)	(3.843)	(3.870)	(3.932)
Firm size	3.492***	3.460***	3.892***	3.021***
	(0.752)	(0.748)	(0.771)	(0.814)
Firm size squared	-0.119***	-0.115***	-0.133***	-0.0936***
	(0.030)	(0.029)	(0.030)	(0.032)
Firm age	9.529***	8.385***	8.858***	8.633***
	(1.337)	(1.272)	(1.353)	(1.375)
Firm age squared	-2.006***	-1.460***	-1.857***	-1.492***
	(0.449)	(0.430)	(0.462)	(0.471)
Wealth (income)				-2.098***
				(0.184)
Wealth (assets owned)				-0.377***
				(0.088)
Owner leverage				-0.338***
				(0.067)
Ownership share				0.172
				(0.567)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.407	0.408	0.406	0.405
Number of observations	8,946,224	8,946,022	8,926,478	8,465,577

Table 13: Effect of diversification on wage insurance, heterogeneity

This table examines the effect of owner diversification on wage growth in response to firm-level exchange rate shocks, analyzing heterogeneous effects. The dependent variable is the change in the logarithm of yearly earnings. Panel A reports estimates for three separate age groups: workers who are between 18 and 34, 35 and 50, and 51 and 65 years of age. Panel B reports estimates for workers who have been at the firm for 5 years or less or more than 5 years, respectively. Only workers who were employed the entire year in t and $t-1$ are included in the sample, thus the minimum tenure is 2. Panel C reports estimates for workers who belong to the first, second, and third tercile of the firm's earnings distribution, respectively. Belonging to a given tercile is assigned based on previous year earnings, with the requirement that the worker did not experience any earnings interruption in the previous year. Control variables are as described in Table 9. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: age

	Age 18-34		**Age 35-50**		**Age 51-65**	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock	6.158***	6.129***	4.279***	3.984***	2.286***	2.044**
	(1.140)	(1.173)	(0.837)	(0.842)	(0.791)	(0.799)
Shock × Diversification	-2.327***	-2.204***	-2.080***	-1.879***	-1.531***	-1.351***
	(0.411)	(0.421)	(0.375)	(0.347)	(0.347)	(0.328)
Diversification	0.423***	0.459***	0.204***	0.224***	0.140***	0.147***
	(0.07)	(0.071)	(0.048)	(0.048)	(0.049)	(0.046)
Tenure	-58.69***	-57.94***	-37.09***	-36.68***	-32.65***	-32.29***
	(1.199)	(1.235)	(0.812)	(0.841)	(0.956)	(0.989)
Tenure squared	12.94***	12.74***	8.582***	8.480***	8.067***	7.982***
	(0.41)	(0.425)	(0.267)	(0.278)	(0.33)	(0.342)
Age	-848.8***	-842.6***	-5196.8***	-5200.5***	-31241.7***	-31168.5***
	(99.777)	(100.697)	(200.513)	(204.794)	(811.398)	(830.963)
Age squared	175.4***	174.0***	925.5***	926.3***	5166.5***	5154.6***
	(21.522)	(21.722)	(36.559)	(37.341)	(133.319)	(136.534)
Firm size	-0.680	-1.298*	1.433**	1.203*	1.835***	1.305**
	(0.670)	(0.711)	(0.653)	(0.600)	(0.679)	(0.619)
Firm size squared	0.0231	0.0386	-0.0518**	-0.0456**	-0.0691***	-0.0513**
	(0.024)	(0.025)	(0.023)	(0.023)	(0.025)	(0.022)
Firm age	7.615***	7.590***	8.669***	8.546***	10.67***	10.64***
	(1.428)	(1.467)	(1.109)	(1.134)	(1.048)	(1.068)
Firm age squared	-2.788***	-2.570***	-2.042***	-1.929***	-2.506***	-2.423***
	(0.495)	(0.508)	(0.356)	(0.362)	(0.331)	(0.336)
Wealth (income)		-1.012***		-1.029***		-1.208***
		(0.134)		(0.111)		(0.105)
Wealth (assets owned)		0.0743*		0.0386		-0.0289
		(0.045)		(0.052)		(0.072)
Owner leverage		-0.353***		-0.260***		-0.341***
		(0.086)		(0.066)		(0.069)
Ownership share		0.773**		0.722**		1.091***
		(0.319)		(0.300)		(0.314)
Industry × year effects	Yes	Yes	Yes	Yes	Yes	Yes
Worker effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Owner effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.559	0.557	0.484	0.483	0.435	0.435
Number of observations	7,641,086	7,304,740	10,567,797	10,090,432	8,787,443	8,408,583

Panel B: tenure

	Tenure $\leq$ 5 years		**Tenure $>$ 5 years**	
	(1)	(2)	(3)	(4)
Shock	2.301*	2.307	3.836***	3.483***
	(1.384)	(1.405)	(0.703)	(0.698)
Shock × Diversification	-2.179***	-2.040***	-1.753***	-1.573***
	(0.465)	(0.465)	(0.342)	(0.304)
Diversification	0.504***	0.502***	0.121***	0.166***
	(0.086)	(0.079)	(0.042)	(0.041)
Tenure	-127.0***	-125.9***	21.13***	21.86***
	(3.164)	(3.265)	(1.571)	(1.603)
Tenure squared	39.03***	38.67***	-16.01***	-16.23***
	(1.163)	(1.202)	(0.589)	(0.600)
Age	336.6***	332.5***	-861.0***	-859.5***
	(29.357)	(30.014)	(20.258)	(20.486)
Age squared	-85.51***	-84.74***	154.9***	154.7***
	(5.947)	(6.088)	(3.727)	(3.769)
Firm size	-0.584	-1.045	1.678***	1.388**
	(0.946)	(0.899)	(0.578)	(0.554)
Firm size squared	-0.00157	0.0105	-0.0550***	-0.0473**
	(0.034)	(0.032)	(0.021)	(0.020)
Firm age	30.55***	29.95***	1.144	1.065
	(1.569)	(1.585)	(0.924)	(0.956)
Firm age squared	-12.24***	-11.84***	-0.27	-0.146
	(0.694)	(0.698)	(0.278)	(0.284)
Wealth (income)		-1.039***		-1.200***
		(0.127)		(0.101)
Wealth (assets owned)		-0.00336		0.0684*
		(0.115)		(0.040)
Owner leverage		-0.323***		-0.259***
		(0.084)		(0.057)
Ownership share		0.289		1.042***
		(0.332)		(0.282)
Industry × year effects	Yes	Yes	Yes	Yes
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	Yes	Yes	Yes	Yes
R^2	0.652	0.652	0.400	0.400
Number of observations	11,187,496	10,659,912	16,816,296	16,101,149

Panel C: earnings

	Bottom Tercile		**Middle Tercile**		**Top Tercile**	
	(1)	(2)	(3)	(4)	(5)	(6)
Shock	2.988***	2.781***	3.894***	3.988***	5.707***	5.068***
	(0.903)	(0.925)	(0.805)	(0.813)	(0.935)	(0.902)
Shock × Diversification	-1.112***	-1.019***	-1.630***	-1.484***	-1.944***	-1.699***
	(0.345)	(0.339)	(0.309)	(0.293)	(0.416)	(0.375)
Diversification	0.206***	0.267***	0.174***	0.171***	0.0884*	0.121**
	(0.058)	(0.052)	(0.040)	(0.039)	(0.051)	(0.051)
Tenure	-38.27***	-38.25***	-19.69***	-19.51***	-24.58***	-24.22***
	(0.803)	(0.830)	(0.860)	(0.889)	(0.634)	(0.645)
Tenure squared	9.827***	9.843***	4.932***	4.924***	6.013***	5.922***
	(0.291)	(0.300)	(0.316)	(0.327)	(0.235)	(0.236)
Age	-231.1***	-231.9***	-1275.8***	-1276.0***	-1584.1***	-1569.2***
	(20.898)	(21.411)	(25.371)	(25.92)	(34.054)	(34.745)
Age squared	48.32***	48.51***	238.8***	238.9***	288.9***	286.4***
	(4.049)	(4.149)	(4.695)	(4.798)	(6.220)	(6.348)
Firm size	-1.485	-1.461	0.879	0.417	2.675***	2.401***
	(0.971)	(0.906)	(0.566)	(0.540)	(0.605)	(0.593)
Firm size squared	0.0572*	0.0506	-0.026	-0.011	-0.0845***	-0.0762***
	(0.035)	(0.032)	(0.020)	(0.019)	(0.021)	(0.021)
Firm age	12.63***	12.44***	1.874**	1.936**	3.002***	2.952***
	(1.305)	(1.332)	(0.900)	(0.907)	(0.947)	(0.959)
Firm age squared	-2.735***	-2.581***	-0.810***	-0.789***	-1.326***	-1.187***
	(0.435)	(0.442)	(0.289)	(0.291)	(0.315)	(0.316)
Wealth (income)		-0.522***		-0.613***		-1.533***
		(0.101)		(0.084)		(0.118)
Wealth (assets owned)		0.157**		-0.0277		0.0512
		(0.068)		(0.037)		(0.049)
Owner leverage		-0.312***		-0.387***		-0.236***
		(0.084)		(0.068)		(0.066)
Ownership share		0.755***		0.854***		0.721***
		(0.287)		(0.310)		(0.268)
Industry × year effects	Yes	Yes	Yes	Yes	Yes	Yes
Worker effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes	Yes	Yes
Owner effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.676	0.675	0.68	0.679	0.526	0.525
Number of observations	8,099,383	7,732,724	8,989,775	8,588,732	9,452,570	9,042,733

Table 14: Effect of diversification on turnover

This table examines the effect of owner's diversification on firm's turnover rate. The dependent variable, turnover rate, is defined as $\frac{\text{new hires} + \text{quits} - \mid \Delta\text{employment} \mid}{\text{average employment in year } t}$, to capture hiring and quitting in excess of employment growth. Owner diversification is the difference between firm variance and owner's portfolio variance, standardized to have mean of zero and standard deviation of one. Firm control variables include size, size squared, age, and age squared. Size is measured as the lagged logarithm of total assets; age is measured as the logarithm of number of years since incorporation. Owner control variables include wealth, owner's leverage, and ownership share. Wealth is proxied by the lagged logarithm of total income reported by the owner in the previous 10 years and by the lagged logarithm of assets owned in all firms, where assets owned are calculated as the product of firm assets and ownership share. Owner's leverage is measured as the lagged ratio of total debt to total assets owned in all firms. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis. In columns (1) to (4), standard errors are clustered at the owner level. In column (5), standard errors are double clustered at the owner and firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)
Diversification	-1.118***	-1.089***	-1.221***	-1.218***	-1.218***
	(0.237)	(0.237)	(0.269)	(0.280)	(0.452)
Firm size	9.171*	9.277*	7.638	9.465	9.465
	(5.446)	(5.451)	(5.727)	(6.601)	(8.536)
Firm size squared	0.0102	0.00491	0.0765	0.109	0.109
	(0.230)	(0.230)	(0.242)	(0.275)	(0.358)
Firm age	-31.56***	-35.78***	-30.87***	-26.97***	-26.97***
	(3.193)	(3.224)	(3.349)	(3.474)	(4.737)
Firm age squared	2.973**	5.350***	2.480*	1.672	1.672
	(1.292)	(1.311)	(1.350)	(1.410)	(1.959)
Wealth (income)				-3.811***	-3.811***
				(0.535)	(0.625)
Wealth (assets owned)				-4.212***	-4.212*
				(1.218)	(2.193)
Owner leverage				-0.643**	-0.643*
				(0.260)	(0.333)
Ownership share				-1.477	-1.477
				(1.584)	(2.008)
Industry × year effects	Yes	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No	No
Firm effects	Yes	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes	Yes
R^2	0.389	0.390	0.404	0.412	0.410
Number of observations	3,805,717	3,805,548	3,729,180	3,518,934	3,518,934

Internet Appendix

Entrepreneurs' Diversification and Labor Income Risk

Jan Bena Marco Pagano Andrew Ellul

Valentina Rutigliano

February 5, 2023

Table A1: Effect of diversification on employment insurance, variance ratio

This table examines the effect of owner diversification on the layoff rate in response to firm-level exchange rate shocks, reporting estimates of Equation (2). The dependent variable is the change in the ratio of layoffs to total employment. Owner's diversification is defined as the ratio of one plus firm variance to one plus portfolio variance, standardized to have mean of zero and standard deviation of one. Control variables are as described in Table 4. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	-4.592***	-3.860***	-4.466***	-4.358***
	(0.631)	(0.628)	(0.646)	(0.668)
Shock × Diversification	0.580***	0.485***	0.577***	0.563***
	(0.100)	(0.099)	(0.106)	(0.109)
Diversification	-0.0456***	-0.0431***	-0.0555***	-0.0492******
	(0.008)	(0.008)	(0.011)	(0.011)
Firm size	-2.029***	-1.912***	-2.079***	-1.613***
	(0.243)	(0.243)	(0.254)	(0.274)
Firm size squared	0.110***	0.102***	0.113***	0.0953***
	(0.009)	(0.009)	(0.010)	(0.010)
Firm age	1.411***	1.735***	1.540***	1.329***
	(0.397)	(0.397)	(0.418)	(0.432)
Firm age squared	-0.309**	-0.486***	-0.354**	-0.309**
	(0.140)	(0.141)	(0.148)	(0.153)
Wealth (income)				-0.196***
				(0.058)
Wealth (assets owned)				0.140***
				(0.034)
Owner leverage				0.144***
				(0.029)
Ownership share				-0.366***
				(0.133)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.129	0.130	0.110	0.112
Number of observations	3,870,297	3,870,130	3,794,227	3,582,904

Table A2: Effect of diversification on employment insurance, alternative layoff measures

This table examines the effect of owner diversification on the layoff rate in response to firm-level exchange rate shocks, reporting estimates of Equation (2). In panel A, the dependent variable is the change in the ratio of layoffs to total employment, excluding workers who earned less than the threshold (equivalent to 13 weeks of full-time work at minimum wage) in a given year, summing earnings from all the jobs they held. In panel B, we exclude seasonal workers (i.e., those whose job spells lasted less than 120 days both in year t and $t-1$). In Panel C, the dependent variable is the ratio of lagged earnings of laid-off workers to lagged total wage bill. Control variables are as described in Table 4. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Workers above threshold

	(1)	(2)	(3)	(4)
Shock	-4.715***	-3.922***	-4.575***	-4.556***
	(0.617)	(0.615)	(0.631)	(0.652)
Shock × Diversification	0.573***	0.471***	0.580***	0.577***
	(0.091)	(0.090)	(0.094)	(0.097)
Diversification	-0.0543***	-0.0508***	-0.0637***	-0.0589***
	(0.008)	(0.008)	(0.010)	(0.010)
Firm size	-1.997***	-1.887***	-2.031***	-1.697***
	(0.227)	(0.227)	(0.237)	(0.254)
Firm size squared	0.111***	0.103***	0.114***	0.101***
	(0.009)	(0.009)	(0.009)	(0.009)
Firm age	0.450	0.769**	0.524	0.293
	(0.373)	(0.373)	(0.392)	(0.406)
Firm age squared	-0.0442	-0.216	-0.0742	-0.0133
	(0.133)	(0.133)	(0.140)	(0.144)
Wealth (income)				-0.190***
				(0.055)
Wealth (assets owned)				0.121***
				(0.032)
Owner leverage				0.111***
				(0.027)
Ownership share				-0.243*
				(0.126)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.122	0.123	0.106	0.108
Number of observations	3,931,489	3,931,316	3,855,987	3,640,541

Panel B: No seasonal workers

	(1)	(2)	(3)	(4)
Shock	-4.680***	-3.917***	-4.567***	-4.482***
	(0.643)	(0.640)	(0.657)	(0.678)
Shock × Diversification	0.616***	0.512***	0.612***	0.596***
	(0.092)	(0.091)	(0.096)	(0.098)
Diversification	-0.0654***	-0.0616***	-0.0732***	-0.0674***
	(0.008)	(0.008)	(0.010)	(0.010)
Firm size	-1.968***	-1.852***	-2.014***	-1.553***
	(0.245)	(0.245)	(0.256)	(0.276)
Firm size squared	0.106***	0.0984***	0.109***	0.0919***
	(0.009)	(0.009)	(0.010)	(0.010)
Firm age	1.529***	1.848***	1.674***	1.407***
	(0.399)	(0.399)	(0.420)	(0.434)
Firm age squared	-0.335**	-0.509***	-0.387***	-0.324**
	(0.141)	(0.141)	(0.149)	(0.154)
Wealth (income)				-0.203***
				(0.058)
Wealth (assets owned)				0.137***
				(0.034)
Owner leverage				0.140***
				(0.029)
Ownership share				-0.386***
				(0.133)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.128	0.129	0.110	0.112
Number of observations	3,864,409	3,864,242	3,788,232	3,577,135

Panel C: Dollar value

	(1)	(2)	(3)	(4)
Shock	-2.644***	-1.998***	-2.544***	-2.321***
	(0.676)	(0.674)	(0.689)	(0.705)
Shock × Diversification	0.450***	0.356***	0.468***	0.425***
	(0.091)	(0.090)	(0.095)	(0.097)
Diversification	-0.0806***	-0.0763***	-0.0958***	-0.0911***
	(0.008)	(0.008)	(0.010)	(0.010)
Firm size	-3.442***	-3.356***	-3.500***	-2.818***
	(0.276)	(0.276)	(0.287)	(0.305)
Firm size squared	0.134***	0.128***	0.137***	0.115***
	(0.010)	(0.010)	(0.011)	(0.011)
Firm age	10.83***	10.94***	12.04***	11.38***
	(0.622)	(0.624)	(0.659)	(0.675)
Firm age squared	-2.538***	-2.601***	-2.925***	-2.742***
	(0.199)	(0.200)	(0.211)	(0.216)
Wealth (income)				-0.228***
				(0.066)
Wealth (assets owned)				0.0131
				(0.038)
Owner leverage				0.195***
				(0.034)
Ownership share				-0.665***
				(0.150)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.198	0.199	0.152	0.154
Number of observations	3,112,023	3,111,904	3,037,843	2,878,440

Table A3: Effect of diversification on employment insurance, import shock

This table examines the effect of owner diversification on the layoff rate in response to firm-level exchange rate export shocks, controlling for import shocks. The dependent variable is the change in the ratio of layoffs to total employment. Import shock is defined analogously to export shock, using the average share of firm i's imports to country c over its total imports in years $t-1$ and $t-2$. Control variables are as described in Table 4. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	-4.948***	-3.944***	-4.795***	-4.672***
	(0.644)	(0.640)	(0.657)	(0.679)
Shock × Diversification	0.607***	0.509***	0.603***	0.583***
	(0.092)	(0.09)	(0.095)	(0.098)
Diversification	-0.0645***	-0.0610***	-0.0727***	-0.0670***
	(0.008)	(0.008)	(0.010)	(0.010)
Import shock	1.197***	0.188	1.103***	1.093***
	(0.397)	(0.396)	(0.404)	(0.415)
Firm size	-2.039***	-1.927***	-2.089***	-1.625***
	(0.244)	(0.243)	(0.255)	(0.274)
Firm size squared	0.110***	0.102***	0.113***	0.0957***
	(0.009)	(0.009)	(0.01)	(0.010)
Firm age	1.402***	1.740***	1.532***	1.322***
	(0.397)	(0.397)	(0.418)	(0.432)
Firm age squared	-0.307**	-0.489***	-0.353**	-0.309**
	(0.140)	(0.141)	(0.148)	(0.153)
Wealth (income)				-0.196***
				(0.058)
Wealth (assets owned)				0.140***
				(0.034)
Owner leverage				0.143***
				(0.029)
Ownership share				-0.367***
				(0.133)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.129	0.130	0.110	0.112
Number of observations	3,870,297	3,870,130	3,794,227	3,582,904

Table A4: Effect of diversification on employment insurance, alternative clustering

This table examines the effect of owner diversification on the layoff rate in response to firm-level exchange rate shocks, reporting estimates of Equation (2). The dependent variable is the change in the ratio of layoffs to total employment. Control variables are as described in Table 4. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are double clustered at the owner and firm level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	-4.670***	-3.901***	-4.540***	-4.421***
	(0.933)	(0.926)	(0.942)	(0.959)
Shock × Diversification	0.614***	0.510***	0.610***	0.590***
	(0.141)	(0.139)	(0.142)	(0.144)
Diversification	-0.0647***	-0.0610***	-0.0728***	-0.0671***
	(0.013)	(0.013)	(0.015)	(0.014)
Firm size	-2.045***	-1.928***	-2.094***	-1.630***
	(0.309)	(0.308)	(0.318)	(0.335)
Firm size squared	0.110***	0.102***	0.113***	0.0960***
	(0.012)	(0.012)	(0.012)	(0.013)
Firm age	1.419***	1.743***	1.549***	1.338***
	(0.537)	(0.538)	(0.550)	(0.560)
Firm age squared	-0.313	-0.490**	-0.359*	-0.314
	(0.191)	(0.191)	(0.195)	(0.199)
Wealth (income)				-0.196***
				(0.061)
Wealth (assets owned)				0.140***
				(0.037)
Owner leverage				0.143***
				(0.033)
Ownership share				-0.367***
				(0.126)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.129	0.130	0.110	0.112
Number of observations	3,870,297	3,870,130	3,794,227	3,582,904

Table A5: Effect of diversification on wage insurance, variance ratio

This table examines the effect of owner diversification on wage growth in response to firm-level exchange rate shocks, reporting estimates of Equation (3). The dependent variable is the change in the logarithm of yearly earnings. Owner's diversification is defined as the ratio of one plus firm variance to one plus portfolio variance, standardized to have mean of zero and standard deviation of one. Control variables are as described in Table 9. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	3.248***	2.977***	3.359***	3.318***
	(0.791)	(0.780)	(0.756)	(0.744)
Shock × Diversification	-1.209***	-1.071***	-1.290***	-1.103***
	(0.259)	(0.248)	(0.268)	(0.271)
Diversification	0.157***	0.157***	0.211***	0.208***
	(0.030)	(0.029)	(0.043)	(0.043)
Tenure	-39.19***	-38.95***	-39.32***	-38.89***
	(0.760)	(0.756)	(0.768)	(0.793)
Tenure squared	8.655***	8.584***	8.683***	8.586***
	(0.226)	(0.225)	(0.228)	(0.236)
Age	-454.6***	-457.4***	-450.3***	-446.9***
	(16.499)	(16.45)	(16.522)	(16.768)
Age squared	80.38***	81.12***	79.66***	79.07***
	(3.114)	(3.105)	(3.116)	(3.166)
Firm size	0.498	1.420***	1.048*	0.614
	(0.392)	(0.387)	(0.544)	(0.517)
Firm size squared	-0.0189	-0.0510***	-0.0384*	-0.0255
	(0.014)	(0.014)	(0.020)	(0.019)
Firm age	7.637***	7.045***	8.089***	8.065***
	(0.844)	(0.780)	(0.860)	(0.878)
Firm age squared	-1.576***	-1.144***	-1.771***	-1.659***
	(0.268)	(0.249)	(0.275)	(0.279)
Wealth (income)				-1.152***
				(0.091)
Wealth (assets owned)				0.0284
				(0.051)
Owner leverage				-0.315***
				(0.049)
Ownership share				0.916***
				(0.257)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.468	0.469	0.469	0.469
Number of observations	28,448,358	28,446,663	28,407,689	27,159,485

Table A6: Effect of diversification on wage insurance, import shock

This table examines the effect of owner diversification on wage growth in response to firm-level exchange rate export shocks, controlling for import shocks. The dependent variable is the change in the logarithm of yearly earnings. Import shock is defined analogously to export shock, using the average share of firm i's imports to country c over its total imports in years $t-1$ and $t-2$. Control variables are as described in Table 9. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	3.961***	3.590***	4.233***	4.026***
	(0.771)	(0.763)	(0.736)	(0.741)
Shock × Diversification	-1.799***	-1.665***	-1.890***	-1.693***
	(0.295)	(0.292)	(0.321)	(0.296)
Diversification	0.192***	0.199***	0.207***	0.226***
	(0.032)	(0.031)	(0.042)	(0.041)
Import shock	0.00917	0.00974	0.00709	0.00612
	(0.006)	(0.006)	(0.006)	(0.006)
Tenure	-39.19***	-38.96***	-39.32***	-38.89***
	(0.760)	(0.756)	(0.768)	(0.793)
Tenure squared	8.656***	8.585***	8.683***	8.586***
	(0.226)	(0.225)	(0.228)	(0.236)
Age	-453.9***	-456.6***	-449.9***	-446.3***
	(16.501)	(16.451)	(16.517)	(16.764)
Age squared	80.25***	80.98***	79.58***	78.97***
	(3.114)	(3.105)	(3.115)	(3.165)
Firm size	0.538	1.455***	1.093**	0.662
	(0.389)	(0.385)	(0.543)	(0.515)
Firm size squared	-0.0204	-0.0523***	-0.0401**	-0.0272
	(0.014)	(0.014)	(0.020)	(0.019)
Firm age	7.640***	7.048***	8.084***	8.060***
	(0.841)	(0.777)	(0.859)	(0.877)
Firm age squared	-1.573***	-1.141***	-1.769***	-1.655***
	(0.267)	(0.248)	(0.275)	(0.279)
Wealth (income)				-1.156***
				(0.091)
Wealth (assets owned)				0.0278
				(0.051)
Owner leverage				-0.316***
				(0.049)
Ownership share				0.906***
				(0.255)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.468	0.469	0.469	0.469
Number of observations	28,448,358	28,446,663	28,407,689	27,159,485

Table A7: Effect of diversification on wage insurance, alternative clustering

This table examines the effect of owner diversification on wage growth in response to firm-level exchange rate shocks, reporting estimates of Equation (3). The dependent variable is the change in the logarithm of yearly earnings. Control variables are as described in Table 9. All coefficients and standard errors are multiplied by 100 for the sake of readability. Standard errors are reported in parenthesis and are triple clustered at the owner, firm, and worker level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Shock	4.150***	3.790***	4.379***	4.152***
	(1.072)	(1.065)	(1.018)	(1.033)
Shock × Diversification	-1.795***	-1.661***	-1.887***	-1.690***
	(0.432)	(0.418)	(0.440)	(0.381)
Diversification	0.191***	0.198***	0.206***	0.225***
	(0.044)	(0.043)	(0.058)	(0.054)
Tenure	-39.19***	-38.96***	-39.32***	-38.89***
	(1.972)	(1.960)	(1.994)	(2.051)
Tenure squared	8.656***	8.585***	8.683***	8.586***
	(0.564)	(0.561)	(0.570)	(0.587)
Age	-454.0***	-456.7***	-450.0***	-446.4***
	(34.086)	(33.891)	(34.369)	(34.343)
Age squared	80.27***	81.00***	79.60***	78.98***
	(6.343)	(6.316)	(6.378)	(6.379)
Firm size	0.532	1.449**	1.089	0.658
	(0.615)	(0.593)	(0.704)	(0.610)
Firm size squared	-0.0201	-0.0520**	-0.0399	-0.0271
	(0.022)	(0.022)	(0.026)	(0.022)
Firm age	7.651***	7.060***	8.092***	8.066***
	(1.467)	(1.358)	(1.298)	(1.352)
Firm age squared	-1.578***	-1.146***	-1.772***	-1.657***
	(0.418)	(0.379)	(0.391)	(0.401)
Wealth (income)				-1.156***
				(0.099)
Wealth (assets owned)				0.0279
				(0.069)
Owner leverage				-0.316***
				(0.053)
Ownership share				0.906***
				(0.236)
Industry × year effects	Yes	Yes	Yes	Yes
Province × year effects	No	Yes	No	No
Worker effects	Yes	Yes	Yes	Yes
Firm effects	Yes	Yes	Yes	Yes
Owner effects	No	No	Yes	Yes
R^2	0.468	0.469	0.469	0.469
Number of observations	28,448,358	28,446,663	28,407,689	27,159,485