# Entrepreneurs' Diversification and Labor Income Risk

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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 hit by 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.

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# 1 Introduction

Labor income risk refers to the uncertainty associated with the potential loss of employment or fluctuations in wages that can affect a person's ability to earn a consistent income. This type of risk is significant because most individuals rely on employment as their primary source of income. 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] Firms play a crucial role in providing implicit insurance to their employees (Azariadis, 1975; Baily, 1974) as they absorb most shocks that hit them rather than passing the shocks directly to employees via wage cuts or dismissals (Guiso et al., 2005; Ellul et al., 2018). The provision of labor income insurance positions firms as key contributors to social welfare and economic stability.

This paper examines the role of owners in the provision of labor income insurance in closely held firms. An entrepreneur's ability to insulate employees from adverse shocks should primarily depend on the extent to which the entrepreneur's own income is exposed to these shocks in the first place. The diversification of an entrepreneur's sources of income should thus be a key determinant of her risk capacity and thereby her ability to honor the implicit contracts with their employees. Entrepreneur' ability to provide insurance against labor income risk can be expected to be the greatest when the firms they own have different exposures to aggregate shocks, that is, when their wealth consists of a diversified portfolio of equity stakes. For example, a negative shock affecting one of the entrepreneur's firms may less likely translate into layoffs and wage cuts in this firm, if the other firms owned by the same entrepreneur are not affected by the shock or are affected by the shock in the

[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).

opposite way. Such diversification across multiple firms adds to the risk capacity of the entrepreneur, and allows her to provide labor income insurance to employees of the affected firm. Prior work provides little empirical evidence on the role played by entrepreneurs' diversification in their firms' provision of such insurance.

The setting of closely held firms is highly relevant to study this question. First, entrepreneurs typically hold most 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). Entrepreneurs' frequent lack of diversification may thus limit the extent to which they can insulate their employees from firm shocks. Second, the vast majority of the private sector labor force is employed in closely held firms, most of which are small and medium-size enterprises (SMEs).[2] Entrepreneurs' diversification may thus be a crucial driver of labor income insurance provision for a large share of the labor force in the economy.

For our analyses, we create a sample of 524,000 Canadian private firms, their employees, and the firms' 858,000 individual shareholders, drawn from the administrative Canadian Employer-Employee Dynamics Database (CEEDD). This dataset enables to identify which firms are owned by the same individual shareholder and thus trace owners' income and wealth from multiple firms. 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, and a firm-shareholder-employee panel of 26 million observations with an average of 1.8 million employees per year.

To construct our key measure that captures an owner's ability to provide labor income insurance to employees of a specific firm due to her diversificaton, we link CEEDD to firm-level export data and define firm-specific exchange rate shocks based on the firm's pre-existing export sales composition by country. Next, we define the risk absorption capacity

[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).

that each owner can provide to each firm in which she invests as the extent to which her portfolio is insulated from the exchange rate fluctuations that hit the firm. Specifically, we measure her risk capacity 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. 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. By the same token, the portfolio of the owner of both an exporting firm and a non-exporting one will be less sensitive to exchange rate shocks than the exporting firm. This example also underscores that, while the portfolio of such an owner can absorb the exporting firm's risk, it tends to transmit such risk to the non-exporting firm. Indeed, the risk bearing capacity that the owner can offer the exporting firm is the flipside of her ability to offload risk on the non-exporting firm, i.e. rests on the risk-bearing capacity offered by this firm to its owner. In other words, diversification places firm owners in the position to intermediate risk across firms featuring different exposure to risk, like insurance companies; they have the capacity of offering protection to firms more exposed against some risks by drawing upon firms less exposed (or not exposed) to those risks.

Our key finding is that shareholders deploy the risk bearing capacity that diversification confers to them: employees' jobs and earnings are significantly more stable in firms whose owners have the capacity to absorb their risk. In our regression analysis, we estimate the extent to which exchange rate shocks affecting firm sales are passed to their employees, and test whether firms owned by better diversified shareholders provide more insurance to their employees. The effect of diversification is economically and statistically significant. We first analyze its effect 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 can provide risk absorption capacity to a firm exposed to exchange rate shocks, a situation that we characterize as a "low-exposure portfolio". This reduction in exposure arises due to low correlation between the returns to the stakes held in different exporting firms, or due to stakes in non-exporting firms. 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 investing in 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, imply-

ing 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 and high-skill workers are less likely to quit in firms owned by diversified shareholders. 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. Finally, we find that owners cut their own pay and increase firm leverage to provide insurance to their workers.

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 Yang, 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 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-

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

level employment is sensitive to shocks in other regions in which the firm operates, and Bena, Dinc and Erel (2022), 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. Fi-

[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).

nancial 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 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 deter-

minant of labor income insurance provision, which is exactly what we set to test in this paper.

# 3 Data

## 3.1 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 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.

[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 10×30×13=3,900. An individual who in 2014 earned more than 3,900 CAD in a firm is considered an employee of that firm. In Table A5 check that results are robust to alternative definitions of being an employee of a given firm: first, we only exclude employees who earn below the threshold across all employers in a given year; second, we exclude workers whom we identify as seasonal. One might conjecture that temporary workers are the first to be laid off when the firm is hit by a negative shock, while the "core" employees receive insurance. We show that results are unchanged when excluding those workers.

Table 2 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 risk absorption capacity is defined at the firm-shareholder-year level (as will be explained 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.[6] 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 ($0.94 million), and employment (7 employees). The layoff rate is also highly skewed: the median layoff rate is 0 but there are cases of massive layoffs, as shown by the fact that the 90$^{\text{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 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

[6] We check that results are robust to assigning the firm to the shareholder with the largest equity share, obtaining a firm-year panel for our analysis of layoffs and a firm-year-worker panel for our analysis of earnings (Tables A1 and A7).

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%.

Next, in Panel D we show that our measure of diversification is positively correlated with straightforward measures such as the number of businesses owned by the shareholder and the number of unique industries represented in the portfolio. Intuitively, an owner with stakes in several firms is more diversified than an owner with a stake in a single firm only. Similarly, owning businesses in different industries, rather than the same number of businesses in a single industry, increases the level of diversification.

Finally, Figure 1 depicts the intensity of bilateral trading relationships (focusing on exports exclusively) between Canada and other countries, aggregated by currency bloc. Unsurprisingly, the United States is the first export destination for Canadian firms, accounting for 31% of trading relationships observed in our sample. Countries using the euro collectively represent Canada's second largest trading partner, making up 14.6% of trading relationships. In terms of individual countries, Germany, France, and the Netherlands are the most important within the eurozone (2.6%, 2.5%, and 1.6%, respectively. Next among the largest trading partners are Great Britain (3.5%), China (3.2%), and Australia (2.8%); fluctuations between the Canadian dollar and the sterling pound, the renminbi, and the Australian dollar represent a source of risk for a large number of Canadian firms. Even though exposure to the US dollar and - to a lesser extent - to the euro is predominant, Canadian firms export to 246 countries and are exposed to many different currencies. The average exporter has 2.76 destination countries per year.

# 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 may 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. [7]

Our methodology is closest to Bertrand (2004) and Caggese et al. (2019). We define our shock $\Delta e_{it}$ as the change in the average exchange rate faced by firm $i$'s in its export

[7] We verify that our results based on export shocks are robust to controlling for import shocks in Tables A2 and A2.

markets between year $t-1$ and $t$. Formally,

$$\Delta e_{it} = \Delta \sum_{c} \eta_{ic\tau} E_{ct},$$

where subscripts $i$, $c$, and $t$ denote firm, country, and year, respectively. We construct our exchange rate index as the weighted average of the natural logarithm of the real exchange rates of export destination countries. Real exchange rates are defined as nominal exchange rates (denoted in CAD per unit of foreign currency) multiplied by the foreign country's consumer price index and divided by the domestic consumer price index. The weights $\eta_{ic\tau}$ are given by 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 $\tau$.[8] An increase in $E_{ct}$ represents an appreciation (in real terms) of country $c$'s currency vis-à-vis the Canadian dollar, which makes Canadian goods cheaper to purchase for foreign buyers. Therefore, a positive $\Delta e_{it}$ amounts to a positive shock for exporters; conversely, a negative $\Delta e_{it}$ is a negative shock.

To clarify the intuition behind our strategy, consider the case of a Canadian company that exports to the United States. Fluctuations in USD/CAD exchange rate represent a risk factor for such firm. 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 our exporter. 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

[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.

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 6$^{th}$ 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 Risk Bearing and Risk Transmission Capacity

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.

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 the risk absorption capacity that diversification enables owners to offer to (some of the) firms in their portfolio with respect to this risk. We should note that we focus on the risk absorption capacity made possible by a diversified portfolio, rather than on diversification per se, defined as allocating wealth to assets with less than perfectly correlated returns. Importantly, in our setting, such risk absorption capacity is defined at the firm-owner level, capturing the firm's exposure to exchange-rate risk relative to that of the portfolio of the firm's owner. When the owner's portfolio is less exposed to exchange rate shocks than the firm, we say that she has capacity to absorb the risk to which the firm is exposed. Conversely, if the owner's portfolio is more exposed to exchange rate shocks than the firm, the owner is in the position to offload exchange rate risk on the firm's employees. In the first case, the owner's portfolio features risk absorption capacity vis-à-vis the firm: she can provide insurance to its employees. In the second case, her portfolio features risk transmission capacity vis-à-vis the firm: she can obtain insurance from its employees, and make their employment and/or wages less stable than they would otherwise be. This is particularly clear if the portfolio is composed of one exporting and one non-exporting firm: shareholdings in the non-exporter enable the owner to mitigates exchange rate shocks to the exporting firm, but from the point of view of the non-exporting firm, shareholdings in the exporting firm may increase its exposure to exchange rate risk.

To capture the extent to which a firm owner can provide labor income insurance against exchange rate shocks affecting the firm, we measure the owner's exposure 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 $\Delta e_{it}$ for each firm $i$ that is part of the owner's portfolio. Next, we define sales shocks for firm $i$ as the product of the export shock and lagged sales: $\Delta \hat{s}_{it} = \Delta e_{it}\, sales_{it-1}$.

Analogously, we construct owner's portfolio-level sales shocks $\Delta \hat{S}_{jt} = \sum_i \omega_{ijt}\, \Delta \hat{s}_{it}$ as the sum of the sales shocks across firms in owner $j$'s portfolio in year $t$, where the weights $\omega_{ijt}$ are proportional to firm $i$'s importance in the owner's portfolio. Finally, we compute the variance of firm $i$'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 distance from full exposure to the shock in firm $i$ as the difference between firm $i$'s variance and owner $j$'s portfolio variance as of time $t$: $RBC_{ijt} = \text{Var}(\Delta \hat{s}_{it}) - \text{Var}(\Delta \hat{S}_{jt})$. This measure captures the distance between full exposure to the shock hitting firm $i$ and actual exposure due to the mitigating (or amplifying) effect given by the owner's portfolio, from the point of view of workers employed in the firm. A positive difference of $RBC_{ijt}$ indicates that the owner's portfolio can mitigate the effect of an export shock to firm $i$. This can be achieved when portfolio firms export to countries whose currencies pairs have a low or negative correlation or when the portfolio also includes non-exporting firms, which are unaffected by exchange rates fluctuations. Conversely, a negative difference indicates that the portfolio can transmit or amplify the effect of an export shock to firm $i$.

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 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 $\text{Var}(\Delta \hat{S}_{it}) = 0$. 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 $RBC_{ijt}$ 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 $\Delta e_{it}$ 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. $\mu_i$ denotes firm fixed effects. $\mu_j$ 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. $\mu_{pt}$ 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. $\mu_{mt}$ denotes industry-by-year fixed effects which capture industry-specific cycles. $\varepsilon_{ijt}$ 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:

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

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. $RBC_{ijt}$ 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 $\varepsilon_{ijt}$ at the owner level. Coefficient $\beta_1$ estimates the elasticity of the dismissal ratio to the export shock affecting firm i, and $\beta_2$ 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:

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

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; $\mu_l$ denotes employee fixed effects; and $\varepsilon_{lijt}$ 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 Online Appendix, we show that the main results in Table 4 are qualitatively unchanged when we convert our shareholder-firm-year panel to a firm-year panel, by restricting the sample to the shareholder with the largest equity share. We also show that results are robust to controlling for import shocks and to an alternative definition of the export shock. In addition, we show that results are similar when one relies on an alternative definition of portfolio diversification, specifically the ratio of firm variance to portfolio variance, and on alternative measures of the layoff rate. Finally, we show that results are robust to alternative clustering of the standard errors.

Table A3 in the Online Appendix is of particular interest. In this table we use the percentage of total sales that is accounted for by exports to construct an alternative measure of the shock. We do not adopt this specification as our preferred one because the share of exports to sales is endogenous and affected by exchange rate fluctuations, while the composition of exports across countries is more stable; however, this exercise allows us to gain better understanding of the economic magnitude of our results. Assume, for a moment, that the economy is composed by firms which export their entire output. We make this assumption to illustrate what would happen if the economy was hit by a large shock, corresponding to a 10 cents appreciation of the Canadian dollar. Firms would increase the layoff rate by 4.4%: in the entire economy, consisting of approximately 18 million workers, 793,000 workers would lose their jobs. This is equivalent to the effect of a severe recession, comparable to the Great Recession or Covid-19. What if shareholders each owned two businesses instead of one? In our sample, this change in the portfolio corresponds to an increase in diversification of about 0.8 standard deviations. In our fictional economy, 45,000 jobs would be preserved as a result.

Getting back to our main results, in Table 5, the 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 7 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 6 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 we restrict the sample to the shareholder with the largest equity holding, to controlling for import shocks, and to defining the export shock in an alternative way. In addition, results are robust to measuring diversification as the ratio of firm variance to portfolio variance 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 12, 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 11, where the estimation is 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, the provision of wage insurance by firms alsovaries 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.

## 5.3 Mechanisms

The results presented so far provided arguably convincing evidence that owner's diversification has a sizeable effect on the provision of insurance against labor income risk. But why do shareholders accept to take on additional risk on behalf of workers? What do they get out of the deal, and where do they draw the necessary resources to provide insurance when a negative shock hits?

To answer these questions, we first examine what happens to owner's pay in response to a shock. Recall that our sample excludes workers who are also equity holders; instead, we now estimate Equation (3) exclusively for owners. In Panel A of Table 14 we show that diversification amplifies the effect of the shock on owner's compensation. This is the opposite of the attenuation effect that diversification has on workers' wages: owners provide insurance to workers by increasing the exposure of their own pay to firm shocks, while

reducing the exposure of workers' pay. This result provides direct evidence of the insurance mechanism being at play. In addition to adjusting their own compensation, shareholders might also borrow to fund the additional expenses related to insurance provision. In Panel B, we show that firms respond to shocks by adjusting financial leverage, and more so when owners are diversified, consistent with diversification increasing debt capacity.

Finally, it is worth asking whether owners' portfolio diversification, by facilitating the provision of insurance against labor income risk, also translates into better employee retention and lower costs of turnover, ultimately affecting firm profitability. We find several pieces of evidence consistent with this motive for insurance provision. The regression results in Panel A of Table 15 shows that indeed labor turnover is significantly lower in firms whose owners are more diversified. The retention motive should be stronger for highly skilled workers; therefore, we focus on employee-initiated separations (recall that the Record of Employment reports the reason for the breaking of an employment relationship) for workers in the top tercile of the earnings distribution. In Panel B, we show that the quitting rate of high-skill employees is lower in firms owned by diversified shareholders.

To further corroborate these results, we examine how the length of workers' employment spells varies depending on the level of shareholder's diversification. We compute the length of an employment spell as the maximum tenure reached by an employee in a firm. In Panel C, we show cross-sectional evidence that workers in firms with diversified owners have higher employment spell durations; the effect is stronger for high-skill workers. These results are broadly consistent with insurance provision acting as a workforce retention mechanism. In addition, we find evidence that insurance provision does not come at the expense of profitability. On the contrary, Panel D shows that firms with more diversified owners are more profitable, which we attribute to the labor retention channel.

Finally, we do not find any evidence of insurance being priced in average wages. Table 16 shows that workers in firms owned by diversified shareholders earn higher average wages, after accounting for firm and workers time-varying and invariant characteristics. It should be noted that the effect is estimated precisely, but it is not economically significant. Therefore, reducing the wage bill is not likely to be an important motive for insurance

provision.

# 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.

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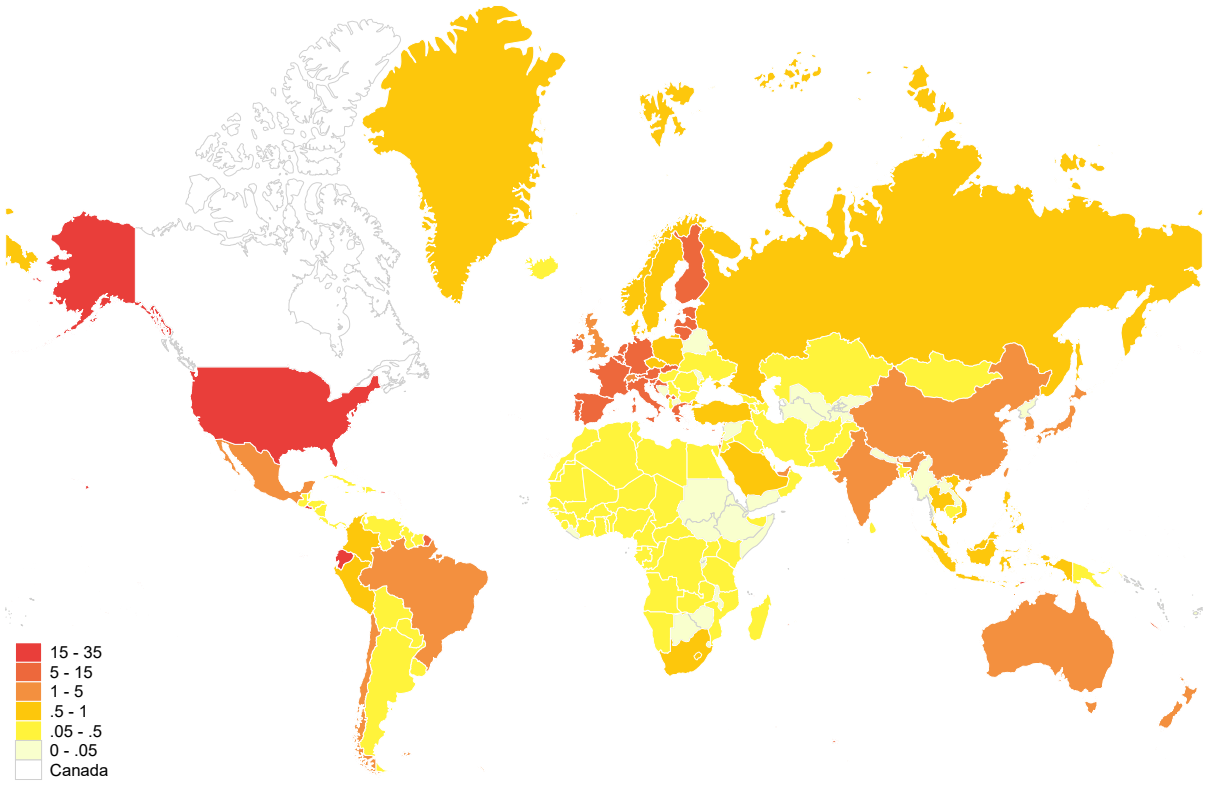
# Figures

**Figure 1: Destination of Canadian exports**
This figure depicts trading relationships between Canada and other countries, aggregated by currency blocs and expressed in percentage terms.



# Tables

**Table 1: Variable Definition**

| Variable | Definition |
|---|---|
| Export shock $\Delta e_{it}$ | 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's risk bearing capacity $RBC_{ijt}$ (difference) | Difference between variance of firm sales shocks and variance of portfolio sales shocks, computed using years from $t-4$ to $t$: $RBC_{ijt} = \mathrm{Var}(\Delta \hat{s}_{it}) - \mathrm{Var}(\Delta \hat{S}_{jt})$. 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 $\iota$ 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 $\iota$'s assets that are owned by $j$ over the assets owned by owner $j$ in all the firms *iota*: $\omega_{\iota jt} = \frac{a_{\iota jt-1}}{\sum_\iota a_{\iota jt-1}}$. $RBC_{ijt}$ is winsorized at 0.5% and 99.5% and standardized to have mean of zero and SD of one. |
| Owner's risk bearing capacity $RBC_{ijt}$ (ratio) | Ratio of firm variance to portfolio variance: $RBC_{ijt} = \frac{1+\mathrm{Var}(\Delta \hat{s}_{\iota t})}{1+\mathrm{Var}(\Delta \hat{S}_{jt})}$. Portfolio variance and firm variance are defined as above. $RBC_{ijt}$ 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 $\Delta w_{lijt}$ | 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 $\iota$, 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. The first table of Panel D tabulates our measure of risk capacity by number of firms owned; t-stat refers to the difference in risk capacity between owners of $n$ and owners of $n-1$ firms. The second table of Panel D tabulates our measure of risk capacity by number of firms owned (down) and number of industries represented in the portfolio (across). Risk capacity is multiplied by 100 for the sake of readibilitiy.

*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: risk capacity*

| **Number of firms owned** | **mean** | **t-stat** | **N** |
|---|---|---|---|
| 1 | 0.0096 | | 1,566,016 |
| 2 | 0.9999 | 46.38*** | 943,831 |
| 3 | 2.864 | 33.10*** | 443,927 |
| 4 | 4.708 | 15.72*** | 221,850 |
| $\geq 5$ | 7.235 | 15.80*** | 407,280 |

| **Number of firms / industries** | 1 | 2 | $\geq 3$ |
|---|---|---|---|
| 1 | 0.0096 | | |
| 2 | 0.5305 | 1.283 | |
| $\geq 3$ | 1.203 | 3.130 | 6.373 |

**Table 3: Effect of exchange rate shock 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: Operating ROA*

| | (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: ROA*

| | (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 risk capacity on employment insurance**

This table examines the effect of owner's risk capacity 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 risk capacity 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 × Risk Capacity | 0.614*** | 0.510*** | 0.610*** | 0.590*** |
| | (0.092) | (0.091) | (0.095) | (0.098) |
| Risk Capacity | -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 risk capacity on employment insurance, positive vs. negative shocks**

This table examines the effect of owner's risk capacity 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 $\Delta e_{it}$ 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 × Risk Capacity | 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) |
| Risk Capacity | -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 risk capacity on employment insurance, large shareholders**

This table examines the effect of owner's risk capacity 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 $\geq$ 33.3%** | | | | **Ownership $\geq$ 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 × Risk Capacity | 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) |
| Risk Capacity | -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 7: Effect of risk capacity on employment insurance, low-exposure portolios**

This table examines the effect of owner's risk capacity 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. Risk Capacity is equal to $RBC_{ijt}$ if $RBC_{ijt} > 0$ 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 × Risk Capacity | 0.640*** | 0.532*** | 0.639*** | 0.621*** |
| | (0.092) | (0.091) | (0.095) | (0.098) |
| Risk Capacity | -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 8: Effect of risk capacity on employment insurance, heterogeneity**

This table examines the effect of owner's risk capacity 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 × Risk Capacity | 0.623*** | 0.643*** | 0.403*** | 0.356*** | 0.484*** | 0.430*** |
| | (0.131) | (0.135) | (0.115) | (0.118) | (0.135) | (0.138) |
| Risk Capacity | -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 × Risk Capacity | 0.693*** | 0.706*** | 0.500*** | 0.439*** | 0.301*** | 0.290*** |
| | (0.153) | (0.158) | (0.144) | (0.148) | (0.100) | (0.102) |
| Risk Capacity | -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 × Risk Capacity | 0.568*** | 0.551*** | 0.388*** | 0.341*** | 0.173* | 0.124 |
| | (0.151) | (0.154) | (0.127) | (0.130) | (0.097) | (0.098) |
| Risk Capacity | -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 risk capacity on wage insurance**

This table examines the effect of owner's risk capacity 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's risk capacity 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 × Risk Capacity | -1.795*** | -1.661*** | -1.887*** | -1.690*** |
| | (0.296) | (0.292) | (0.322) | (0.296) |
| Risk Capacity | 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 risk capacity on wage insurance, positive vs. negative shocks**
This table examines the effect of owner's risk capacity 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 $\Delta e_{it}$ 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 × Risk Capacity | -2.001*** | -1.838*** | -2.118*** | -1.904*** |
| | (0.332) | (0.329) | (0.367) | (0.336) |
| Risk Capacity | 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 × Risk Capacity | 6.876*** | 6.772*** | 6.331*** | 5.470*** |
| | (1.814) | (1.736) | (1.726) | (1.771) |
| Risk Capacity | 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 risk capacity on wage insurance, large shareholders**

This table examines the effect of owner's risk capacity 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 × Risk Capacity | -2.814*** | -2.685*** | -2.698*** | -2.270*** |
| | (0.703) | (0.707) | (0.795) | (0.653) |
| Risk Capacity | 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 × Risk Capacity | -2.432*** | -2.213*** | -2.362*** | -2.287*** |
| | (0.747) | (0.755) | (0.833) | (0.857) |
| Risk Capacity | 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 12: Effect of risk capacity on wage insurance, low-exposure portfolios**
This table examines the effect of owner's risk capacity 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. Risk capacity is equal to $RBC_{ijt}$ if $RBC_{ijt} > 0$ 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 × Risk Capacity | -1.938*** | -1.779*** | -1.970*** | -1.780*** |
| | (0.296) | (0.292) | (0.316) | (0.293) |
| Risk Capacity | 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 13: Effect of risk capacity on wage insurance, heterogeneity**

This table examines the effect of owner's risk capacity 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 × Risk Capacity | -2.327*** | -2.204*** | -2.080*** | -1.879*** | -1.531*** | -1.351*** |
| | (0.411) | (0.421) | (0.375) | (0.347) | (0.347) | (0.328) |
| Risk Capacity | 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 × Risk Capacity | -2.179*** | -2.040*** | -1.753*** | -1.573*** |
| | (0.465) | (0.465) | (0.342) | (0.304) |
| Risk Capacity | 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 × Risk Capacity | -1.112*** | -1.019*** | -1.630*** | -1.484*** | -1.944*** | -1.699*** |
| | (0.345) | (0.339) | (0.309) | (0.293) | (0.416) | (0.375) |
| Risk Capacity | 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: Mechanisms for insurance provision**

This table examines the effect of owner's risk capacity on shareholder's pay (Panel A) and firm leverage (Panel B). In Panel A, the dependent variable is the change in the logarithm of yearly earnings received by the shareholder for work in the firm. In Panel B, the dependent variable is the change in leverage, measured as the ratio of total debt to total assets. Owner's risk capacity 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.

*Panel A: owner's compensation*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Shock | 3.046 | 1.245 | 1.618 | -0.624 |
| | (3.008) | (3.012) | (3.032) | (3.064) |
| Shock × Risk Capacity | 2.146*** | 2.232*** | 2.015** | 1.739** |
| | (0.804) | (0.803) | (0.823) | (0.822) |
| Risk Capacity | -0.152 | -0.133 | -0.0966 | 0.0577 |
| | (0.103) | (0.103) | (0.123) | (0.121) |
| Firm size | 7.336*** | 7.280*** | 8.626*** | 3.311** |
| | (1.225) | (1.221) | (1.287) | (1.413) |
| Firm size squared | -0.123** | -0.122** | -0.175*** | 0.197*** |
| | (0.048) | (0.048) | (0.051) | (0.054) |
| Firm age | -56.63*** | -59.63*** | -73.92*** | -64.83*** |
| | (2.116) | (2.130) | (2.160) | (2.158) |
| Firm age squared | 11.61*** | 13.13*** | 17.79*** | 19.65*** |
| | (0.749) | (0.754) | (0.766) | (0.766) |
| Wealth (income) | | | | -41.08*** |
| | | | | (0.418) |
| Wealth (assets owned) | | | | -2.928*** |
| | | | | (0.216) |
| Owner leverage | | | | -0.791*** |
| | | | | (0.132) |
| Ownership share | | | | 26.29*** |
| | | | | (0.838) |
| 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 |
| $R^2$ | 0.173 | 0.174 | 0.196 | 0.206 |
| Number of observations | 2241894 | 2,241,847 | 2,192,834 | 2,110,509 |

*Panel B: leverage*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Shock | -2.010** | -1.690* | -1.883* | -1.718* |
| | (0.952) | (0.954) | (0.966) | (0.968) |
| Shock × Risk Capacity | -0.780*** | -0.794*** | -0.788*** | -0.550*** |
| | (0.140) | (0.140) | (0.144) | (0.143) |
| Risk Capacity | 0.177*** | 0.166*** | 0.181*** | 0.00677 |
| | (0.019) | (0.019) | (0.023) | (0.021) |
| Firm size | 60.25*** | 60.20*** | 62.60*** | 31.60*** |
| | (1.710) | (1.713) | (1.812) | (1.390) |
| Firm size squared | -2.056*** | -2.052*** | -2.136*** | -1.023*** |
| | (0.065) | (0.065) | (0.069) | (0.052) |
| Firm age | 1.942*** | 3.204*** | 2.735*** | 5.270*** |
| | (0.735) | (0.736) | (0.774) | (0.776) |
| Firm age squared | 0.289 | -0.389 | -0.0494 | -0.327 |
| | (0.261) | (0.262) | (0.276) | (0.278) |
| Wealth (income) | | | | 1.049*** |
| | | | | (0.111) |
| Wealth (assets owned) | | | | -2.169 |
| | | | | (0.083) |
| Owner leverage | | | | -8.119*** |
| | | | | (0.125) |
| Ownership share | | | | -0.209 |
| | | | | (0.236) |
| 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 |
| $R^2$ | 0.380 | 0.381 | 0.366 | 0.386 |
| Number of observations | 3,913,512 | 3,913,341 | 3,838,043 | 3,627,305 |

**Table 15: The benefits of risk capacity for shareholders**

This table examines the effect of owner's risk capacity on firm outcomes to understand mechanisms behind insurance provision. Panel A examines the effect of risk capacity on the rate of turnover. The dependent variable is defined as $\frac{\text{new hires + quits} - \mid \Delta\text{employment} \mid}{\text{average employment in year } t}$, to capture hiring and quitting in excess of employment growth. Panel B examines the effect of risk capacity on the rate of employee-initiated (voluntary) separations for workers belonging to the top tercile of earnings, based on total earnings reported in the previous year. Panel C examines the effect of risk capacity on firm profitability, defined as the ratio of net income to assets. Owner risk capacity 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.

*Panel A: turnover*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Risk Capacity | -1.118*** | -1.089*** | -1.221*** | -1.218*** |
| | (0.237) | (0.237) | (0.269) | (0.280) |
| Firm size | 9.171* | 9.277* | 7.638 | 9.465 |
| | (5.446) | (5.451) | (5.727) | (6.601) |
| Firm size squared | 0.0102 | 0.00491 | 0.0765 | 0.109 |
| | (0.230) | (0.230) | (0.242) | (0.275) |
| Firm age | -31.56*** | -35.78*** | -30.87*** | -26.97*** |
| | (3.193) | (3.224) | (3.349) | (3.474) |
| Firm age squared | 2.973** | 5.350*** | 2.480* | 1.672 |
| | (1.292) | (1.311) | (1.350) | (1.410) |
| Wealth (income) | | | | -3.811*** |
| | | | | (0.535) |
| Wealth (assets owned) | | | | -4.212*** |
| | | | | (1.218) |
| Owner leverage | | | | -0.643** |
| | | | | (0.260) |
| Ownership share | | | | -1.477 |
| | | | | (1.584) |
| 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 |
| $R^2$ | 0.389 | 0.390 | 0.404 | 0.412 |
| Number of observations | 3,805,717 | 3,805,548 | 3,729,180 | 3,518,934 |

*Panel B: voluntary separations*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Risk Capacity | -0.0306*** | -0.0287*** | -0.0383*** | -0.0380*** |
| | (0.006) | (0.006) | (0.008) | (0.008) |
| Firm size | -0.630* | -0.547* | -0.696** | -0.483 |
| | (0.323) | (0.323) | (0.332) | (0.342) |
| Firm size squared | 0.0452*** | 0.0413*** | 0.0470*** | 0.0364*** |
| | (0.012) | (0.012) | (0.012) | (0.012) |
| Firm age | 1.895*** | 1.095** | 1.939*** | 1.594*** |
| | (0.465) | (0.464) | (0.495) | (0.509) |
| Firm age squared | -0.551*** | -0.0806 | -0.560*** | -0.444** |
| | (0.160) | (0.160) | (0.170) | (0.174) |
| Wealth (income) | | | | -0.153** |
| | | | | (0.062) |
| Wealth (assets owned) | | | | 0.109*** |
| | | | | (0.033) |
| Owner leverage | | | | 0.0843*** |
| | | | | (0.031) |
| Ownership share | | | | -0.877*** |
| | | | | (0.132) |
| 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 |
| $R^2$ | 0.409 | 0.410 | 0.376 | 0.377 |
| Number of observations | 2,356,378 | 2,356,265 | 2,272,979 | 2,155,177 |

*Panel C: employees' tenure*

| | **All employees** | | **Top tercile** | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Risk Capacity | 11.561*** | 5.830*** | 19.938*** | 8.514*** |
| | (0.267) | (0.257) | (0.573) | (0.562) |
| Industry effects | No | Yes | No | Yes |
| Province effects | No | Yes | No | Yes |
| $R^2$ | 0.004 | 0.105 | 0.003 | 0.105 |
| Number of observations | 479,119 | 459,684 | 366,787 | 356,386 |

*Panel D: profitability*

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Risk capacity | 0.0673*** | 0.0902*** | 0.0819*** | 0.161*** |
| | (0.017) | (0.017) | (0.021) | (0.021) |
| Firm size | -21.96*** | -21.88*** | -23.02*** | -10.02*** |
| | (1.003) | (1.005) | (1.060) | (1.001) |
| Firm size squared | 0.560*** | 0.553*** | 0.594*** | 0.164*** |
| | (0.038) | (0.038) | (0.040) | (0.037) |
| Firm age | 4.613*** | 2.162*** | 4.635*** | 3.813*** |
| | (0.729) | (0.726) | (0.771) | (0.780) |
| Firm age squared | -1.668*** | -0.335 | -1.624*** | -1.310*** |
| | (0.266) | (0.265) | (0.282) | (0.285) |
| Wealth (income) | | | | -3.334*** |
| | | | | (0.125) |
| Wealth (assets owned) | | | | -0.488*** |
| | | | | (0.075) |
| Owner leverage | | | | 3.448*** |
| | | | | (0.111) |
| Ownership share | | | | -0.570** |
| | | | | (0.239) |
| 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 |
| $R^2$ | 0.626 | 0.629 | 0.623 | 0.633 |
| Number of observations | 3,947,833 | 3,947,657 | 3,873,302 | 3,656,510 |

**Table 16: Is insurance priced into lower average wages?**

This table examines the effect of owner's risk capacity's on earnings level. The dependent variable is 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 clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Risk Capacity | 0.163*** | 0.147*** | 0.184*** | 0.216*** |
| | (0.035) | (0.033) | (0.050) | (0.046) |
| Tenure | 23.62*** | 23.90*** | 23.75*** | 23.77*** |
| | (0.281) | (0.280) | (0.282) | (0.292) |
| Tenure squared | -5.799*** | -5.895*** | -5.837*** | -5.815*** |
| | (0.129) | (0.128) | (0.129) | (0.134) |
| Age | -32.86** | -42.77*** | -31.06** | -37.12** |
| | (14.595) | (14.418) | (14.646) | (14.930) |
| Age squared | 56.17*** | 58.46*** | 55.85*** | 57.03*** |
| | (2.859) | (2.825) | (2.872) | (2.927) |
| Firm size | 7.369*** | 7.384*** | 6.774*** | 6.164*** |
| | (0.889) | (0.871) | (0.915) | (0.953) |
| Firm size squared | -0.0862*** | -0.0936*** | -0.0611** | -0.0434 |
| | (0.028) | (0.027) | (0.029) | (0.030) |
| Firm age | -15.81*** | -17.06*** | -15.81*** | -15.64*** |
| | (0.806) | (0.802) | (0.812) | (0.816) |
| Firm age squared | 1.679*** | 2.482*** | 1.725*** | 1.775*** |
| | (0.295) | (0.288) | (0.295) | (0.297) |
| Wealth (income) | | | | -0.166* |
| | | | | (0.089) |
| Wealth (assets owned) | | | | 0.0447 |
| | | | | (0.038) |
| Owner leverage | | | | -0.397*** |
| | | | | (0.056) |
| Ownership share | | | | 0.960*** |
| | | | | (0.283) |
| 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 |
| $R^2$ | 0.911 | 0.911 | 0.911 | 0.912 |
| Number of observations | 40,997,274 | 40,994,996 | 40,964,081 | 39,114,880 |

# Internet Appendix

# Entrepreneurs' Diversification and Labor Income Risk

**Table A1: Effect of risk capacity on employment insurance, firm-year panel**

This table examines the effect of owner's risk capacity on the layoff rate in response to firm-level exchange rate shocks, reporting estimates of Equation (2). We restrict the sample to the shareholder with the largest share, obtaining a firm-year panel. 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 clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Shock | -4.234*** | -3.386*** | -3.888*** | -3.654*** |
| | (0.974) | (0.970) | (1.031) | (1.064) |
| Shock × Risk Capacity | 0.648*** | 0.578*** | 0.691*** | 0.699*** |
| | (0.133) | (0.131) | (0.143) | (0.146) |
| Risk Capacity | -0.0753*** | -0.0726*** | -0.0837*** | -0.0878*** |
| | (0.013) | (0.013) | (0.014) | (0.015) |
| Firm size | -2.016*** | -1.901*** | -2.035*** | -1.804*** |
| | (0.327) | (0.327) | (0.358) | (0.399) |
| Firm size squared | 0.107*** | 0.0996*** | 0.109*** | 0.0963*** |
| | (0.012) | (0.012) | (0.014) | (0.015) |
| Firm age | 1.412** | 1.719*** | 1.688*** | 1.812*** |
| | (0.575) | (0.575) | (0.643) | (0.665) |
| Firm age squared | -0.297 | -0.461** | -0.412* | -0.496** |
| | (0.206) | (0.206) | (0.230) | (0.238) |
| Wealth (income) | | | | -0.141 |
| | | | | (0.091) |
| Wealth (assets owned) | | | | 0.268*** |
| | | | | (0.058) |
| Owner leverage | | | | 0.129** |
| | | | | (0.040) |
| Ownership share | | | | -0.484** |
| | | | | (0.214) |
| 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 |
| $R^2$ | 0.093 | 0.094 | 0.132 | 0.133 |
| Number of observations | 2,190,587 | 2,190,485 | 2,123,549 | 2,002,153 |

**Table A2: Effect of risk capacity on employment insurance, import shock**

This table examines the effect of owner's risk capacity 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 × Risk Capacity | 0.607*** | 0.509*** | 0.603*** | 0.583*** |
| | (0.092) | (0.09) | (0.095) | (0.098) |
| Risk Capacity | -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 A3: Effect of risk capacity on employment insurance, alternative shock**

This table examines the effect of owner's risk capacity on the layoff rate in response to firm-level exchange rate shocks, reporting estimates of Equation (2). We define the shock as $\Delta e_{it} = \sum_c \eta_{ic\tau} \Delta E_{ct}$, where the weight $\eta_{ic\tau}$ is the share of firm $i$'s exports to country $c$ over total sales. 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 clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Shock | -43.02*** | -35.59*** | -40.64*** | -44.04*** |
| | (6.668) | (6.651) | (6.843) | (7.090) |
| Shock × Risk Capacity | 3.022*** | 2.973*** | 2.835*** | 3.140*** |
| | (0.695) | (0.693) | (0.720) | (0.743) |
| Risk Capacity | -0.0438*** | -0.0404*** | -0.0454*** | -0.0463*** |
| | (0.012) | (0.012) | (0.015) | (0.015) |
| Firm size | -2.014*** | -1.898*** | -2.062*** | -1.598*** |
| | (0.243) | (0.243) | (0.254) | (0.274) |
| Firm size squared | 0.109*** | 0.101*** | 0.112*** | 0.0946*** |
| | (0.009) | (0.009) | (0.010) | (0.010) |
| Firm age | 1.399*** | 1.721*** | 1.526*** | 1.319*** |
| | (0.397) | (0.397) | (0.417) | (0.432) |
| Firm age squared | -0.302** | -0.478*** | -0.346** | -0.303** |
| | (0.140) | (0.141) | (0.148) | (0.153) |
| Wealth (income) | | | | -0.198*** |
| | | | | (0.058) |
| Wealth (assets owned) | | | | 0.140*** |
| | | | | (0.034) |
| Owner leverage | | | | 0.144*** |
| | | | | (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 risk capacity on employment insurance, variance ratio**

This table examines the effect of owner's risk capacity 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 risk capacity 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 × Risk capacity | 0.580*** | 0.485*** | 0.577*** | 0.563*** |
| | (0.100) | (0.099) | (0.106) | (0.109) |
| Risk capacity | -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 A5: Effect of risk capacity on employment insurance, alternative layoff measures

This table examines the effect of owner's risk capacity 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 × Risk Capacity | 0.573*** | 0.471*** | 0.580*** | 0.577*** |
| | (0.091) | (0.090) | (0.094) | (0.097) |
| Risk Capacity | -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 × Risk Capacity | 0.616*** | 0.512*** | 0.612*** | 0.596*** |
| | (0.092) | (0.091) | (0.096) | (0.098) |
| Risk Capacity | -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 × Risk Capacity | 0.450*** | 0.356*** | 0.468*** | 0.425*** |
| | (0.091) | (0.090) | (0.095) | (0.097) |
| Risk Capacity | -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 A6: Effect of risk capacity on employment insurance, alternative clustering**

This table examines the effect of owner's risk capacity 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 × Risk Capacity | 0.614*** | 0.510*** | 0.610*** | 0.590*** |
| | (0.141) | (0.139) | (0.142) | (0.144) |
| Risk Capacity | -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 A7: Effect of risk capacity on wage insurance, firm-year-worker panel**

This table examines the effect of owner's risk capacity on wage growth in response to firm-level exchange rate shocks, reporting estimates of Equation (3). We restrict the sample to the shareholder with the largest share, obtaining a firm-year-worker panel. 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 clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Shock | 4.753*** | 3.962*** | 5.506*** | 5.006*** |
| | (1.203) | (1.204) | (1.174) | (1.174) |
| Shock × Risk Capacity | -2.315*** | -2.167*** | -1.996*** | -1.776*** |
| | (0.503) | (0.495) | (0.476) | (0.490) |
| Risk Capacity | 0.308*** | 0.322*** | 0.307*** | 0.291*** |
| | (0.068) | (0.064) | (0.071) | (0.074) |
| Tenure | -40.37*** | -40.12*** | -40.18*** | -39.68*** |
| | (0.824) | (0.820) | (0.833) | (0.860) |
| Tenure squared | 8.716*** | 8.639*** | 8.655*** | 8.556*** |
| | (0.247) | (0.246) | (0.249) | (0.259) |
| Age | -392.5*** | -394.8*** | -393.5*** | -390.3*** |
| | (22.554) | (22.467) | (23.002) | (23.491) |
| Age squared | 68.42*** | 69.06*** | 68.70*** | 68.17*** |
| | (4.297) | (4.279) | (4.382) | (4.480) |
| Firm size | 1.711*** | 2.166*** | 2.611*** | 1.970*** |
| | (0.556) | (0.544) | (0.561) | (0.583) |
| Firm size squared | -0.0578*** | -0.0733*** | -0.0903*** | -0.0668*** |
| | (0.021) | (0.020) | (0.021) | (0.022) |
| Firm age | 8.212*** | 7.406*** | 7.982*** | 8.008*** |
| | (1.199) | (1.100) | (1.258) | (1.297) |
| Firm age squared | -1.635*** | -1.175*** | -1.652*** | -1.455*** |
| | (0.388) | (0.360) | (0.409) | (0.423) |
| Wealth (income) | | | | -1.708*** |
| | | | | (0.176) |
| Wealth (assets owned) | | | | -0.128* |
| | | | | (0.072) |
| Owner leverage | | | | -0.378*** |
| | | | | (0.072) |
| Ownership share | | | | 0.468 |
| | | | | (0.361) |
| 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 |
| $R^2$ | 0.332 | 0.333 | 0.348 | 0.348 |
| Number of observations | 12,156,424 | 12,156,095 | 12,125,311 | 11,522,677 |

**Table A8: Effect of risk capacity on wage insurance, import shock**

This table examines the effect of owner's risk capacity 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 × Risk Capacity | -1.799*** | -1.665*** | -1.890*** | -1.693*** |
| | (0.295) | (0.292) | (0.321) | (0.296) |
| Risk Capacity | 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 A9: Effect of risk capacity on wage insurance, alternative shock**

This table examines the effect of owner's risk capacity on wage growth in response to firm-level exchange rate shocks, reporting estimates of Equation (3). We define the shock as $\Delta e_{it} = \sum_c \eta_{ic\tau} \Delta E_{ct}$, where the weight $\eta_{ic\tau}$ is the share of firm $i$'s exports to country $c$ over total sales. 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 clustered at the owner level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Shock | 10.69*** | 7.273*** | 13.24*** | 14.05*** |
| | (2.839) | (2.775) | (2.714) | (2.654) |
| Shock × Risk Capacity | -2.138*** | -2.053** | -2.340** | -1.983** |
| | (0.820) | (0.818) | (0.938) | (0.791) |
| Risk Capacity | 0.0501 | 0.0328 | -0.0133 | 0.0366 |
| | (0.032) | (0.031) | (0.057) | (0.052) |
| Tenure | -39.18*** | -38.95*** | -39.32*** | -38.88*** |
| | (0.760) | (0.756) | (0.768) | (0.793) |
| Tenure squared | 8.654*** | 8.583*** | 8.682*** | 8.584*** |
| | (0.226) | (0.225) | (0.228) | (0.236) |
| Age | -455.9*** | -458.8*** | -452.0*** | -448.3*** |
| | (16.485) | (16.439) | (16.510) | (16.758) |
| Age squared | 80.63*** | 81.40*** | 79.98*** | 79.34*** |
| | (3.111) | (3.103) | (3.114) | (3.164) |
| Firm size | 0.480 | 1.413*** | 0.945* | 0.482 |
| | (0.405) | (0.399) | (0.540) | (0.514) |
| Firm size squared | -0.0181 | -0.0505*** | -0.0343* | -0.0202 |
| | (0.015) | (0.015) | (0.020) | (0.019) |
| Firm age | 7.624*** | 7.032*** | 8.110*** | 8.093*** |
| | (0.851) | (0.787) | (0.865) | (0.881) |
| Firm age squared | -1.564*** | -1.134*** | -1.794*** | -1.683*** |
| | (0.271) | (0.252) | (0.276) | (0.280) |
| Wealth (income) | | | | -1.133*** |
| | | | | (0.093) |
| Wealth (assets owned) | | | | 0.0152 |
| | | | | (0.052) |
| Owner leverage | | | | -0.322*** |
| | | | | (0.049) |
| Ownership share | | | | 0.943*** |
| | | | | (0.261) |
| 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 A10: Effect of risk capacity on wage insurance, variance ratio**

This table examines the effect of owner's risk capacity 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 risk capacity 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 × Risk Capacity | -1.209*** | -1.071*** | -1.290*** | -1.103*** |
| | (0.259) | (0.248) | (0.268) | (0.271) |
| Risk Capacity | 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 A11: Effect of risk capacity on wage insurance, alternative clustering**

This table examines the effect of owner risk capacity 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 × Risk Capacity | -1.795*** | -1.661*** | -1.887*** | -1.690*** |
| | (0.432) | (0.418) | (0.440) | (0.381) |
| Risk Capacity | 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 |