LUISS Guido Carli
LIBERA UNIVERSITÀ INTERNAZIONALE DEGLI STUDI SOCIALI

CeLEG Working Paper Series

EMPLOYMENT AND WAGE INSURANCE WITHIN FIRMS: WORLDWIDE EVIDENCE

Andrew Ellul, Marco Pagano and Fabiano Schivardi

Working Paper No. 06/15
October 2015

Center for Labor and Economic Growth
Department of Economics and Finance
LUISS Guido Carli
Viale Romania 32, 00197, Rome -- Italy
http://www.luiss.edu/celeg

Dipartimento di
ECONOMIA E FINANZA

Employment and Wage Insurance within Firms: Worldwide Evidence

Andrew Ellul
Kelley School of Business, Indiana University, CSEF and ECGI

Marco Pagano
University of Naples Federico II, CSEF, EIEF, CEPR and ECGI

Fabiano Schivardi
Bocconi University, EIEF, IGIER and CEPR

1 July 2015

Abstract

We investigate the determinants of firms' implicit employment and wage insurance to employees, using a difference-in-difference approach: we rely on differences between family and non-family firms to identify the supply of insurance, and exploit variation in unemployment insurance programs across and within countries to gauge workers' demand for insurance. Using a firm-level panel from 41 countries, we find that family firms provide more stable employment than non-family ones, and in exchange they obtain both greater wage flexibility and lower labor cost: on average, their real wages are 5 percent lower, controlling for country, industry and time effects. The additional employment security provided by family firms is greater, and the wage discount larger, the less generous is public unemployment insurance: private and public provision of employment insurance appear to be substitutes.

JEL classification: G31, G32, G38, H25, H26, M40.

Keywords: risk-sharing, insurance, social security, unemployment, wages, family firms.

Acknowledgements: We are grateful to Ernst Maug, Tarun Ramadorai, David Sraer and Oren Sussman for insightful remarks and suggestions. Useful comments were also provided by Alon Brav, Yaniv Grinstein, Nandini Gupta, Beni Lauterbach, Amir Licht, David Matsa, Colin Mayer, Arzu Ozoguz, Merih Sevilir, David Thesmar, Vikrant Vig, Yishay Yafeh, David Yermack, and participants at the 2012 Ackerman Conference on Corporate Governance (Bar-Ilan University), 2014 AFA Annual Meeting, CSEF 1st Conference on Finance and Labor, Hebrew University Finance Conference, the 21st Mitsui Finance Symposium on Labor and Finance, the 2015 FIRS Annual Meeting, and at seminars at Chinese University of Hong Kong, HEC Paris, Hong Kong University of Science and Technology, Indiana University, Queen Mary College, Universidade Catolica Portuguesa, University of Oxford, Università della Svizzera Italiana (USI), and University of Houston. This research has been sponsored by grants from the ERC (FINLAB project no. 295709), the Italian Ministry for University and Research and the Sardinian Region (Law 7 CUP F71J09000300002).

"The family business in Warroad, Minnesota, that didn't lay off a single one of their four thousand employees during this recession, even when their competitors shut down dozens of plants, even when it meant the owners gave up some perks and pay … understood their biggest asset was the community and the workers who helped build that business…" (President Obama, 2012)[1]

"In 1976 I faced Gianni Agnelli with a drastic choice: here at FIAT we must lay off 25,000 employees, I told him. He thought about it for two days, then replied: it cannot be done. That reply contained the moral heritage of his grandfather, his Savoy spirit, a sense of a commitment towards the country and Turin and also his respect for workers' dignity. I could not remain at FIAT and watch the company's coffers bleed empty, so I quit. In retrospect, I was right from the company's viewpoint, but from a broader, historical and social viewpoint, he was right." (Carlo De Benedetti, former CEO of FIAT, 2013)[2]

The idea that entrepreneurs insure workers against risk by giving them a stable income dates back at least to Knight (1921): "The system under which the confident and venturesome assume the risk and insure the doubtful and timid by guaranteeing to the latter a specified income in return for an assignment of the actual results ... is the enterprise and wage system of industry" (p. 269-70). This idea was formalized in the *implicit contract* model of Baily (1974) and Azariadis (1975), where risk-neutral entrepreneurs provide insurance to risk-averse workers by insulating their salaries and (under more restrictive conditions) employment from adverse shocks to production, in exchange for a lower average salary.[3] Entrepreneurs' lesser risk-aversion may not be rooted in their preferences but in differential access to capital markets: if entrepreneurs can diversify idiosyncratic risk away better than workers, they behave "as if" they were less risk-averse, and therefore insure workers. Indeed, as Berk and Walden (2013) observe, capital markets enable firms to offload the risk they assume from workers with firm-specific human capital by giving them a lifetime wage that is totally insensitive to firm-specific risk.

[1] *Baltimore Sun*, "Obama's full remarks", 6 September 2012.

[2] *La Repubblica*, "Agnelli, Intervista a De Benedetti", 13 February 2013.

[3] Azariadis (1975) shows that firms offer full employment insurance only if the product price is not too variable and economy-wide labor demand is above average.

Implicit contract theory rests on two basic assumptions. First, since the contract is implicit it must be self-enforcing: in particular, the firm must be able to commit to honor its promises even in the event of a bad shock. This can be viewed as a *supply-side* determinant of insurance provision. Second, workers must value the insurance provided: this is a *demand-side* determinant of firm-level insurance. We exploit heterogeneity along these two dimensions to study the role of firms as providers of insurance to their employees in a 25-years panel of firms from 41 countries. On the supply side, we follow the literature that views family firms as better positioned than non-family firms to sustain implicit insurance contracts, due to their greater ability to commit not to breach them. On the demand side, we rely on differences *across* and *within* countries in public insurance programs: where and when the government provides more unemployment insurance, workers can be expected to demand less from firms. This substitutability relationship is reminiscent of Agarwal and Matsa (2013), who find that US firms take more risk by pursuing less conservative financial policies in states that increase unemployment insurance benefits. Accordingly our evidence addresses two main questions: Do family firms actually provide more insurance? And does the difference depend on the amount of public insurance?

There is a good deal of anecdotal evidence that family and non-family firms differ in their credibility as providers of insurance, as the two epigraphs above illustrate. Family firms are less likely to breach implicit contracts with their employees, because the reputation of the controlling family is at stake. Long-term ownership and control, possibly over generations, enable them to win the trust of their employees, giving them a strong incentive, in order to retain it, to keep their promises. Their credibility is also buttressed by their characteristic invulnerability to hostile takeovers, and hence to unforeseen changes in control, as argued by Shleifer and Summers (1988).[4] In the context of implicit contract theory, this "commitment hypothesis" implies that family firms can credibly offer both more secure employment and more stable wages than non-family firms. Of course, to deliver on this commitment they must be able to access financial markets in order to smooth shocks. Therefore, when they are not threatened by financial distress they should

[4] A firm's implicit contracts with its employees lack credibility where control is contestable, because the firm may be taken over by an entrepreneur who is not bound by this commitment. Shleifer and Summers (1988) argue that a corporate raider may be attracted precisely by the potential short-run gain from breaching such contracts, such as by firing workers when sales diminish or cutting wages once employees' investment in firm-specific human capital is sunk.

be able to provide more insurance. In exchange for this security, they will be able to pay lower wages, effectively earning an "insurance premium".

Family firms are also known to feature more "paternalistic" and less confrontational labor relations, as Charles Heinz, vice-president of the Heinz company testifies: "I think the fact that I'm in the Heinz family helps make for a better climate in labor negotiations" (Mueller and Philippon, 2011, p. 218). Hence they may offer greater employment stability not only because of their commitment ability, but also because they can persuade their employees to accept wage reductions in the case of adverse events. In other words, insofar as they face less friction in ex-post wage bargaining, family firms can retain their employees even in bad times when this is efficient (as their marginal product still exceeds their reservation wage) by negotiating wage reductions. Under this "renegotiation hypothesis", family firms should be expected to provide more employment insurance at the cost of less wage insurance. This implication differs from the pure implicit contract model, which predicts that wages too are stabilized. By examining how wages react to shocks, therefore, one can assess the relative importance of these two mechanisms.

A second reason why firms may differ in the provision of insurance to employees has to do with the extent of substitute social arrangements, which limit employees' *demand* for insurance from their employers. Workers are less likely to demand insurance from firms in countries where its value is diminished by the ample availability of public social security arrangements, such as unemployment insurance. The existing literature has shown that unemployment insurance provides significant consumption smoothing benefits to unemployed workers (Gruber, 1997) and affects both unemployment risk and the wage differentials that compensate workers for such risk (e.g., Topel and Welch, 1980; Topel, 1983, 1984). Empirically, we proxy the differences in workers' demand for insurance with differences across countries in the income replacement rate (the ratio of unemployment benefits to previous salary). In addition to the cross-country heterogeneity, we exploit within-country changes in public insurance provision due to reforms of national social security systems: since workers' demand for employment stability can only be affected by a persistent change in the provision of public insurance against unemployment risk, we filter out changes in the replacement rate at business-cycle frequencies arising from automatic stabilizers in the social security system, and focus on changes in the replacement rate due to changes in national laws.

Clearly, where unemployment programs provide substantial insurance to workers, the potential advantage of family firms should vanish, whereas in countries and periods in which the government provides limited unemployment benefits it should be substantial. This leads naturally to a differences-in-differences strategy, based on the interaction between family-firm status and national social security provision, to investigate whether family firms and social security are substitutes. Since workers are also less likely to demand insurance against the loss of employment in countries and periods in which they expect to find a new job relatively quickly, we also explore whether the employment stability provided by family firms depends on the tightness of the labor market.

Our tests rely on a firm-level panel comprising 7,710 firms in 41 countries from 1988 to 2012, which allows us to exploit cross-country differences in social security arrangements and in legal reforms of these arrangements, as well as in labor market characteristics. We measure shocks to firms as fluctuations in industry-level sales or as the unanticipated component of the change in firm-level sales. These two different measures of shocks capture different aspects of firms' insurance provision to their employees, and each has its own merits and shortcomings, as explained in Section 2. We further decompose shocks into temporary and permanent components and assess employment and wage insurance by estimating the elasticity of employment changes to the shocks and to their temporary and permanent components.

The evidence from our international panel data is that family firms do in fact stabilize employment more than non-family firms, and that their insurance provision is greater in countries and periods where that of the public sector is less extensive, and therefore firm-level insurance is more valuable to workers. There is also some evidence that family firms provide less employment insurance in situations where it is easy to get another job, i.e. where the long-term unemployment rate is low. Moreover, as predicted by Gamber (1988), family firms appear to be better able to provide employment insurance in response to transitory than to permanent shocks. Finally, their insurance capability depends on their financial soundness: family firms with very low *z*-scores are virtually indistinguishable from equally distressed non-family firms in providing insurance to their employees. In other words, if a family firm lacks access to the financial market, as distressed companies typically do, its superior ability to commit to insurance becomes irrelevant.

We also inquire whether firms differ in their provision of wage insurance. The evidence shows that family firms actually provide *less* wage insurance than non-family firms. Since they also provide more employment insurance, this finding is consistent with the "renegotiation hypothesis" outlined above; with the idea, that is, that greater trust in industrial relations enables family firms to provide job security in exchange for wage flexibility. Further, the data suggest that the unemployment insurance provided by the government does not affect the provision of wage insurance by firms, and by family firms in particular.[5]

Besides accepting greater wage flexibility, family firms' employees also appear to be willing to accept lower wage levels. In our data, wages in family firms are 5 percent lower on average, controlling for country, industry and time effects. The wage discount obtained by family firms accords with the predictions of the implicit contract theory of Baily (1974) and Azariadis (1975) jointly with the "commitment hypothesis"; namely, with the idea that family firms are more credible in the provision of insurance.

Admittedly, this result should be taken cautiously because our data do not allow us to control for unobservable skill differentials between employees of family and non-family firms, which could affect their respective wages. However, the idea that employment stability is priced in family firms' wages squares also with the fact that the wage discount is larger in countries and periods in which public unemployment insurance is less generous: when a reform of the social security system reduces the safety net for the unemployed, workers place greater value on the additional job security provided by family firms, hence are willing to accept a larger wage discount to work there. Even so, implicit contract theory alone cannot fully explain our empirical findings. Under that theory, workers should accept a lower average wage in exchange for wage stability, while our data suggest that their greater job stability comes together with less wage stability, not just lower wages.

One might argue that family firms provide more stable employment because they belong to industries with more stable demand or technology, or that they have a better match with their employees, and therefore stronger incentive to retain their workers. However, differences between family and non-family firms can hardly explain the fact that the supply of employment insurance by family firms tends to substitute for the

[5]These results are obtained on a considerably smaller sample than those regarding employment insurance, since our international dataset excludes wage indications for over 50 percent of the firms for which we have employment data.

shortfall in public employment insurance. Suppose for instance that family firms were particularly good at producing good matches with employees, and therefore were more inclined to preserve these valuable matches by engaging in labor hoarding when faced by a drop in sales. Then, it would be hard to explain why such labor hoarding behavior should be systematically correlated with social security arrangements across countries or over time. In contrast, it is natural to explain this correlation as arising from the variation in the demand for insurance by employees across countries with different social security systems or following legal reforms of these systems.

Nevertheless, we perform a number of robustness checks to address alternative explanations of our results: the outcome of these checks strengthen the provision of employment insurance hypothesis.

First, we repeat the estimation on a sample of family firms matched with non-family firms with similar capitalization and cash flow volatility in the same industry and country, and obtain results that are qualitatively similar to those found with panel estimation on the full sample. Hence, our findings cannot be explained by industry-related, size-related or country-related characteristics affecting family and non-family firms differentially.

Second, to address the concern that our results may be affected by unobserved differences between family and non-family firms, we re-estimate our regressions separately on the two subsamples. We find again that family firms mitigate more the impact of sales shocks when public unemployment insurance is less generous: these firms respond to social security reforms behaving as substitutes for public unemployment insurance. In contrast, when the regression is estimated on the subsample of non-family firms, employment stabilization does not respond significantly to public insurance.

Third, the results are also robust to the inclusion of country-time effects, which control for any country-specific aggregate variable, including country-level business cycle fluctuations: in this specification, firm-level employment changes – our dependent variable – is purged of all aggregate country-level variation, thereby eliminating any potential reverse causality from aggregate employment changes to the extent of public unemployment insurance.

Finally, our results are robust to several other modifications of the empirical design, such as the inclusion of the degree of financial development, and to alternative definitions

of the variables, such as the measurement of public unemployment insurance and the definition of family firms.

Our study differs from previous works on risk-sharing within firms, which focus on single countries and accordingly cannot explore how differences in public unemployment insurance influence risk-sharing or disentangle demand from supply considerations. The previous literature focuses only on the firms' characteristics (ownership, control or capital structure) and the types of shock that affect risk-sharing with employees.

Several papers examine the difference between family and non-family firms in France, where family firms appear to provide more employment insurance: Sraer and Thesmar (2007) and Bassanini et al. (2013) demonstrate that in heir-managed firms employment is less sensitive to industry-wide sales shocks, average wages are lower and profits higher, as implicit contract theory maintains. Employment insurance also seems to buy social peace: family firms not only have lower layoff risk (Bach and Serrano-Velarde, 2010), but also fewer strikes and a less unionized work force, inflict sanctions less commonly and undergo litigation less frequently (Müller and Philippon, 2007; Waxin, 2009). For Italy, D'Aurizio and Romano (2013) show that family firms reacted to the 2008 crisis by safeguarding more than non-family firms workplaces close to the firm's headquarters, compared to other, more distant plants. For U.S. listed companies, the evidence is weaker: in family-managed firms downsizing is less likely, but more severe; in family-owned firms, job cuts exceeding 6 percent of the workforce are less common (Block, 2008).

Kim, Maug and Schneider (2011) investigate whether risk-sharing within firms is affected by workers' role in corporate governance. Using establishment-level panel data for German companies, they seek to determine whether Germany's mandated 50 percent labor representation on supervisory boards is associated with greater employment and wage insurance against industry shocks. They find that white-collar and skilled blue-collar workers in firms with parity codetermination are protected against layoffs and wage cuts, but not unskilled workers. And white collar workers alone pay for this benefit with a 3 percent lower wage.

There is also evidence that firms' ability to access credit affects their ability to provide risk-sharing benefits. Sharpe (1994) documents that, in the United States, employment responds more sharply to fluctuations in aggregate output in the more highly leveraged firms. Caggese and Cuñat (2008) build and calibrate a dynamic model in which financially constrained firms tend to employ more temporary workers, who absorb a

larger portion of overall employment volatility than in unconstrained firms. These predictions are confirmed by their empirical estimates for a panel of small and medium-sized Italian manufacturing firms in 1995-2000.

Another strand of research investigates firms' wage insurance against temporary and permanent shocks. Guiso, Pistaferri and Schivardi (2005) show that Italian workers' earnings are consistent with full insurance against transitory shocks to the firm's value added, and considerable insurance even against permanent shocks: the standard deviation of wage growth shocks is 12 percent, compared with a hypothetical value of 40 percent in the case of no insurance. Broadly similar results are reported for Portugal by Cardoso and Portela (2009), for Hungary by Kàtai, and for Germany by Guertzgen (2013).

The paper is organized as follows. Section 1 lays out the empirical methodology. Section 2 describes the data. Sections 3 presents the results on employment insurance, Section 4 those on wage insurance, and Section 5 investigates whether employment stability is priced in real wages. Section 6 concludes.

1. Empirical methodology

Our main aim is to gauge how the extent of risk-sharing within firms depends on firms' ownership structure and other characteristics, and on relevant country characteristics, namely the extent of public social security insurance, the severity of unemployment hardship and the degree of financial development. Firms may offer insurance to their employees by stabilizing jobs and/or their wages in the face of falling demand – for example, by not dismissing workers or requiring wage cuts when the industry's or the firm's sales decline. Our methodology is to estimate the elasticity of employment or wages to "shocks" in sales and explore how it varies with the above factors– especially how it differs between family and non-family firms, and how it varies with social security arrangements, unemployment hardship and country-level financial development. In different specifications of our regressions, we adopt different definitions of a "shock" in sales: in some specifications, it is the percentage change in the industry's sales; in others, it is an idiosyncratic firm-level shock, measured as the unexpected component of the change in the firm's sales. In yet other specifications, we break down the change in sales into positive and negative, or transitory and persistent components.

Our methodology is best illustrated by considering the baseline specification of the employment regression that we use to investigate how the provision of employment insurance differs between family and non-family firms:

$$n_{it} = \beta_1 \varepsilon_{it} + \beta_2 \varepsilon_{it} F_{it} + \beta_3 \varepsilon_{it} S_{ct} + \beta_4 \varepsilon_{it} F_{it} S_{ct} + \beta_5 F_{it} + \beta_6 S_{ct} + \beta_7 F_{it} S_{ct} + \gamma' X_{it-1} + \mu_{cj} + \mu_t + u_{it}, \quad (1)$$

where the subscripts *i*, *j*, *c* and *t* index firms, industries, countries and years respectively, n_{it} is the log of the growth rate in employment of firm *i* in year *t*, ε_{it} is either an idiosyncratic shock to the sales of firm *i* or to the sales of its industry *j* (less firm *i* itself) in year *t*, F_{it} is a family-firm dummy equal to 1 for family-owned firms and 0 for non-family firms, S_{ct} is a measure of public unemployment insurance (based on the income replacement rate) provided in country *c* and year t, and X_{it-1} is a vector of company-specific variables measured in year $t-1$: firm size (measured as the log of market capitalization), asset tangibility (ratio of plant, property and equipment to total assets), profitability (return on total assets), and leverage (ratio of total debt to total assets). Finally, μ_{cj} is a country-industry effect, μ_t is a year effect, and u_{it} is the error term. In some specifications we use firm fixed effects instead of country-industry effects.

The coefficient β_1 measures the elasticity of employment to the sales shock in non-family firms, β_2 measures the difference in that elasticity between family and non-family firms, β_3 captures the baseline effect of public insurance on risk-sharing in firms, β_4 captures the differential effect of public insurance on risk-sharing in family firms, β_5 controls for potential differences in the rate of employment growth between family and non-family firms, β_6 controls for the baseline effect of public insurance on employment growth, and β_7 allows for family-owned firms to have different employment growth rates in countries with different public insurance systems. This means, for instance, that $\beta_2 < 0$ indicates that employment responds less to shocks in family than in non-family firms ($\beta_2 = -\beta_1$ being the case of full insurance by family firms), $\beta_3 > 0$ that more public insurance is associated with a greater response of employment to shocks (i.e. less employment insurance provision by both family and non-family firms), and $\beta_4 > 0$ that this effect is stronger for family firms (i.e., that the provision of employment insurance by non-family firms shrinks more than that non-family firms as public insurance increases).

A possible concern about specification (1) is reverse causality from firm-level employment growth n_{it} to the provision of public unemployment insurance S_{ct} in the corresponding country: governments may expand the provision of employment insurance in recessions and reduce it in expansions. We mitigate this endogeneity concern also by purging our measure of public unemployment insurance of any automatic business-cycle variation: as explained in detail in Section 2.1, the variable S_{ct} varies by construction only when legal reforms change either the unemployment replacement rate or the length of the benefits' eligibility period, and therefore is unaffected by the operation of automatic stabilizers built into existing social security rules. Moreover, in one variant of specification (1) we address the potential endogeneity of public unemployment insurance more drastically, by replacing the time effect μ_t with a country-time effect μ_{ct}: the inclusion of this variable absorbs any country-level aggregate variation from the firm-level employment growth n_{it} and therefore any possible feedback from aggregate employment growth to unemployment insurance S_{ct}. Of course, in this variant of specification (1) the term in the level of S_{ct} must be dropped due to perfect collinearity with the country-time effect μ_{ct}.

In other specifications of the employment equation, we replace or complement the S_{ct} variable with a measure of labor market tightness and a measure of financial development. A tight labor market, where dismissed workers are unlikely to remain unemployed for long, should lower the demand for employment insurance from firms and so intensify the response of employment to shocks. Therefore, the interaction of labor market tightness with the shock (and possibly also that with the shock and the family-firm dummy) should have a positive coefficient. The coefficient of the interaction between financial development and the shock ε_{it} is ambivalent: a more developed financial system should allow firms to supply more insurance to workers (by enabling them to better diversify the implied risk) but may also allow workers to deal with job loss either by borrowing or through private insurance, and therefore demand less insurance from their employer. Hence, the coefficient of the interacted variable should be negative if financial development mainly increases firms' supply of insurance; positive if, instead, it mainly decreases workers' demand for insurance from their employers. Finally, the coefficient of the triple interaction between financial development, the shock ε_{it} and the family-firm

dummy should capture the differential effect of financial development on the insurance provided by family firms: a positive coefficient here would indicate that less developed financial markets are associated with a comparative disadvantage of family firms in insurance provision.

Firms should be better positioned to insure their employees against transitory than persistent shocks. This prediction was first tested and corroborated by Gamber (1988) with reference to wage insurance, and then with more sophisticated empirical methodologies by Guiso, Pistaferri and Schivardi (2005) for Italy, by Cardoso and Portela (2009) for Portugal, by Kàtai (2008) for Hungary, and by Guertzgen (2013) for Germany. As far as we know, however, the prediction has not been tested for employment insurance. In one of our specifications, we investigate whether employment responds differently to persistent and to transitory shocks to sales, and whether the extent of the difference varies between family and non-family firms. To this end we adapt the approach taken by Guiso, Pistaferri and Schivardi (2005) to the case of employment insurance, simplifying some of their assumptions (see Appendix B for details).

We also test whether firms differ in the propensity to stabilize wages, and specifically whether this type of insurance differs between family and non-family firms and across different levels of public employment insurance, labor market tightness and/or financial development. To do so, we estimate an equation analogous to (1), the only difference being that the dependent variable is the growth rate of the average real wage:

$$w_{it} = \delta_1 \varepsilon_{it} + \delta_2 \varepsilon_{it} F_{it} + \delta_3 \varepsilon_{it} S_{ct} + \delta_4 \varepsilon_{it} F_{it} S_{ct} + \delta_5 F_{it} + \delta_6 S_{ct} + \delta_7 F_{it} S_{ct} + \phi' X_{it-1} + \mu_{cj} + \mu_t + u_{it}, \quad (2)$$

Unfortunately, as explained below, the sample for estimating this regression is considerably smaller than for employment equation (1), as wage data are available for only about 43 percent of the firms for which we have employment data, since reporting wages in accounting data is at the firm's discretion.

Finally, we can test an important prediction of implicit contract theory, namely that the employment or wage insurance provided by companies to their employees will be "priced" in their wages, in the sense that companies that offer more stable employment or wages can pay less for their workers' services. We test this hypothesis in two ways. First, since the estimates of equation (1) and its variants indicate that family firms offer more job security, we test whether the average wage at family firms is lower than at non-family

firms, controlling for various firm and country characteristics. We also check if the difference is related to the degree of public insurance provision. Second, we test whether the average wage at firm level is correlated with the elasticity of employment to sales shocks (an inverse measure of employment insurance), estimated as the coefficient θ_{1i} in the following regression for each firm *i*:

$$n_{it} = \theta_{0i} + \theta_{1i}\varepsilon_{it} + \gamma_i' X_{it-1} + \mu_t + \xi_{it}, \quad (3)$$

where θ_{0i} is the firm-specific constant, ε_{it} is a measure of firm-specific unexpected sales shock, X_{it-1} is a vector of firm-specific variables measured in year $t-1$, μ_t is a year effect, and ξ_{it} is the error term.

2. Data and variables

To gauge the differential ability of firms to provide employment and wage insurance in countries with different unemployment insurance systems, we bring together three types of data: (i) firm-level measures of employment, wages and sales and other characteristics such as total assets, leverage, asset tangibility and profitability; (ii) firm ownership, to classify firms as family or non-family firms; and (iii) country-level measures of public unemployment insurance, labor market tightness and financial development.

2.1 Sources and definitions

Employment, wage and financial data for firms outside the U.S. are drawn from Worldscope and Osiris and for U.S. firms from Compustat, which contains historical data from the financial reports of listed companies. We collect data for firms incorporated and listed in 41 countries in the period 1988-2012, with two screens: we eliminate financial institutions and firms that do not have employment data (total number of employees at firm level) for at least seven consecutive years, so that we can compute employment insurance over a reasonably long period. This leaves 7,710 firms and 115,827 firm-year observations. Wage data (total staff costs at the firm level) for at least seven consecutive years are available for a subset of 3,290 firms; however, we check that our results about employment insurance continue to hold in this subset of firms.

Family firms are defined as those where a family blockholder is the ultimate largest shareholder, has at least 25 percent of the firm's cash flow rights, and is present in the firm's management. This strict definition is applied in all our baseline tests, although we then check robustness by relaxing it in two ways: (a) lowering the threshold for cash flow rights to 10 percent, or (b) retaining the 25 percent threshold but removing the requirement of presence in the firm's management.

Ownership data are based on the same sources used in Ellul et al. (2010). In identifying whether the firm's ultimate owner is a family blockholder, the major challenge is that in many firms the largest shareholder is a private company or a nominee account, in which case one must identify the owner of these private companies to establish if the firm's ultimate owner is a family blockholder or not. To this purpose, we first use the scant ownership data in Worldscope, together with hand-collected data taken from company websites from 2007 onwards (updated every two years), and – for European firms – data from the ownership file of AMADEUS. Altogether these sources allow us to identify the ultimate blockholder for less than 15 percent of our sample. For the remaining firms, we resort to direct information obtained via a questionnaire about their ultimate owner. For non-respondents we use the classification in Faccio and Lang (2002) for European firms and that in Stijn, Claessens, Djankov, and Lang (2000) for East Asian firms: we classify as non-family firms those that are classified as "widely held" by these studies. For US firms, we collect information about their ownership from the 20-F forms or proxy statements every two years over the same period. The definition of family firms varies in the literature, mostly because of different ownership thresholds used to define family blockholders: based on our criterion, the sample of 7,710 firms used in our estimation contains 2,359 family firms. The resulting fraction of slightly over 30% is bracketed by those reported in previous studies.[6]

Our country-level measure of public unemployment insurance, S_{ct}, is based on the income replacement rate, i.e. the ratio of unemployment benefits to previous salary. We use the gross replacement rates as computed by Aleksynska and Schindler (2011), using the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross wage. This measure is intended to

[6] The fraction of family firms in our dataset is smaller than in the dataset of Faccio and Lang (2002) (for European firms) and of Stijn, Claessens, Djankov, and Lang (2000) (for Asian firms), but larger than in the dataset used by Lins et al. (2013).

capture both the level and the duration of unemployment benefits, which are the two measures used by Agrawal and Matsa (2013) in their study on US state-level data. Aleksynska and Schindler (2011) calculate gross replacement rates for the first and second year of unemployment at annual frequency by identifying changes in regulations. The information is obtained from a variety of sources, including the ILO, OECD and national agencies. We extend their measures, which are computed up to 2005, to the end of our sample period (2012). This variable – hereafter labeled "unemployment security" – is used in all our specifications to measure the public provision of unemployment insurance.

However, since workers' demand for employment stability is likely to be affected only by persistent changes in the provision of public insurance against unemployment risk, we wish to purge the unemployment security measure of reforms that are in effect only for a short period. To this purpose, we construct an alternative measure of unemployment security that tracks only changes of the replacement rate resulting from persistent reforms of national social security systems. To identify such reforms, we use the same sources used by Aleksynska and Schindler (2011), especially the website of the US Social Security Administration (SSA), which keeps a comprehensive history of such reforms (http://www.ssa.gov/policy/docs/progdesc/ssptw). The resulting variable – labeled "structural unemployment security" – jumps to a new level only when a reform changes the magnitude of the replacement rate or the length of time for which workers receive unemployment insurance, and afterwards it is kept constant until the subsequent reform. Therefore, it differs from the actual replacement rate, which also reflects temporary changes. For our baseline specification we will use the gross replacement rates to measure the public provision of employment insurance, and then investigate whether our results are robust to the use of structural unemployment security, reporting the corresponding results in Appendix A.

Finally, we measure labor market tightness as the reciprocal of the share of long-term in total unemployment ("long-term" defined as 12 months or more), drawn from OECD (2012), higher values indicating shorter unemployment duration, hence greater security. While the previous two measures capture the quality of the public safety net for dismissed workers, labor market tightness captures the likelihood of finding a new job quickly, hence the extent to which the state of the labor market itself mitigates unemployment hardship. This variable therefore captures a different dimension of the demand for

employment insurance. Since we have no strong a priori view about which of these matters most to firms' provision of job insurance, we allow for all four different measures in our specifications.

2.2 Measures of sales shocks

The sales shock ε_{it} is a key variable in both specifications (1) and (2). As already mentioned, we measure these shocks in two different ways, and we use both measures to test the robustness of our results. First, we measure the sales shock ε_{it} as the growth of the sales of the industry to which firm *i* belongs, after subtracting the sales of firm *i* itself. The advantage of this measure is that it does not include the sales of firm *i*, and therefore avoids potential reverse causality from employment growth to sales growth of firm *i*. The disadvantage is that industry-level shocks may give a biased measure of firms' employment insurance, as they compound two elements that are actually distinct: namely, how much insurance a firm offers when hit by a shock and how exposed the firm is to industry shocks. As argued by Michelacci and Schivardi (2012), family firms might select low-risk-low-return, and possibly less cyclically sensitive, projects. If so, employment in family firms might respond less to industry shocks because these firms are less exposed to them. In fact, when we regress firm sales growth on industry sales growth (including the controls X_{it-1}, the country-industry dummies μ_{cj} and the time dummies μ_t), we find that the coefficient for non-family firms is 0.57, while the coefficient of the interaction between industry shocks and the family dummy is -0.22, significant at the 5 percent level. Although this still implies lower employment risk in family firms, the underlying economic mechanism is very different from the firm's sheltering workers from actual shocks. This explains why we also rely on a measure of firm-level idiosyncratic shocks ε_{it}, estimated as the residual from a first-stage predictive regression: the growth rate of the sales of firm *i* in year *t* is regressed on its lagged value, the same set of firm-level control variables as in specification (1), industry effects and country-time effects. The inclusion of country-time effects ensures that the resulting estimates of the firm-level sales shocks are purged of all country-level aggregate variation in sales, and therefore reflect purely firm idiosyncratic risk. Since the lagged dependent variable and fixed effects are included, the predictive equation is estimated via the generalized method of moments (GMM) of Arellano and Bond (1991), to obtain consistent estimates. The

residual from this regression is then included as the ε_{it} variable in the estimation of equations (1) and (2) and their variants. To correct for the generated regressor problem, in all the specifications that rely on this measure of the shock ε_{it} we use bootstrapped standard errors calculated using 100 repetitions.

2.3 Descriptive statistics

Table 1 gives the number of firms for each of the 41 countries in our sample. As expected, there is significant variation, with the U.S., Japan, the United Kingdom, Germany, France and Australia having the largest samples of firms.

[Insert Table 1]

Columns 1 and 2 show the number of non-family and family firms in each country. The relative number of these two types of firms varies considerably across countries: non-family firms are more widespread in Australia, Canada, Ireland, Japan, New Zealand, Norway, the United Kingdom and the United States, being at least twice as many as family ones; the opposite occurs in Argentina, Brazil, Greece, Hong Kong, Malaysia, Mexico and South Korea, where family firms are more widespread than non-family ones. The differences are less extreme in continental Europe, but also there the picture is mixed, with fewer family firms in Denmark, France, Germany, the Netherlands, Spain and Sweden, and more in Italy and Portugal. Overall, our sample includes about twice as many non-family firms as family firms. Columns 3 and 4 report average firm sales growth by country, for non-family and family firms respectively. Broadly speaking, firms in emerging markets have higher annual sales growth than in developed countries, but there is also significant dispersion in the comparative performance of family and non-family firms: in some countries (e.g. Australia, Brazil, Colombia, Hong Kong, Singapore and Czech Republic) sales growth is faster in family firms, while in others (e.g. France, Germany, Mexico, the Netherlands, New Zealand and South Africa) the opposite is true. Columns 5 and 6 show average total employment in non-family and family firms. In almost all countries family firms have fewer employees, consistently with the literature on the relative size of family and non-family firms.

Column 7 shows the average gross income replacement rates for the countries in our sample, i.e. our unemployment security measure. There are significant differences across

countries: for example, in Colombia, Indonesia, Malaysia, Mexico, and Singapore, the replacement rate is zero; in France, the Netherlands, Norway, Portugal, Spain, and Switzerland it is over 0.40. In addition, the rates vary very significantly over time - within the same country - in a good number of countries due to reforms in unemployment insurance. For example, South Korea had no unemployment insurance until 1994, introduced it in 1995 with a replacement rate of 0.125, which was reduced to 0.063 in 2002. In Australia there have been several changes to the social security system: the replacement rate rose gradually to 0.23 in 1997 and then slowly decreased to 0.19 in 2007. To highlight this variability over time, column 8 of Table 1 shows the coefficient of variation of the gross replacement rate for each country, i.e. its standard deviation divided by its average over 1988-2012. Several countries – such as Italy, South Korea, Taiwan, Thailand and Turkey – experienced significant changes; others did not: for example, Mexico had no unemployment insurance throughout the entire period, while there has been little variation over time in the United Kingdom and Spain, respectively around a low and high average value of the replacement rate.

Figure 1 and 2 illustrate the cross-country and within-country variability of unemployment security. Figure 1 displays the time series of unemployment security for the two countries with the largest number of firms in our sample from America (United States and Canada), Asia (Japan and South Korea), and Europe (United Kingdom and Germany). The figure confirms the considerable variability of replacement rates over time, as well as the variation of its average level across countries. Figure 2 documents that unemployment security varies widely both across countries and over time also for the sample as a whole: the left panel of the figure illustrates cross-country variation, by plotting the average replacements rate for each country; the right panel provides a gauge of the time variation of replacements rates within each country, and shows that only 9 countries (out of 41) feature no change in unemployment security over the sample period.

[Insert Figures 1 and 2]

Finally, column 9 of Table 1 reports unemployment duration (i.e. the share of long-term joblessness of 12 months or more) for OECD countries.[7] This measure also varies considerably across countries. For example, in Mexico and South Korea long-term

[7] The table shows the average share of long-term unemployment, *not* its reciprocal, the variable we define as "labor market tightness" and use in our empirical analysis.

unemployment is around 2 percent of total unemployment, whereas in the Belgium, Italy, Czech Republic, Greece and Germany it is around 50 percent. These statistics show that the variability across countries and over time is wide enough to warrant investigating whether it affects the demand for employment and wage insurance.

3. Employment insurance within firms

Here we investigate the regression results on the extent to which family and non-family firms provide employment insurance, controlling for that furnished by the social security system, for labor market tightness, and for the country's level of financial development.

3.1 Baseline regression estimates

Table 2 shows the estimates of various specifications of the employment growth equation (1), where the sales shock for each firm-year observation is the contemporaneous growth in sales of the firm's industry and country, net of that of the firm itself. All regressions in the table include year dummies; those in columns 1-5 also include country-industry fixed effects, while column 6 includes firm-level fixed effects to control for time-invariant unobserved heterogeneity at the firm level. Standard errors are clustered at firm level.[8]

[Insert Table 2]

The baseline elasticity of employment to industry sales (top row) is positive and significant ($\beta_1 > 0$): it ranges between 12% and 19% depending on the specification. The rate of employment growth does not appear to differ significantly between family and non-family firms ($\beta_5 = 0$).

More interestingly, in family firms the response of employment to sales is considerably milder than in non-family ones ($\beta_2 < 0$). In fact, family firm employment is effectively insulated from industry sales shocks, as the coefficient of the interaction between the shock and the family-firm dummy (third row) completely offsets the baseline elasticity

[8] We also cluster standard errors at the country level; the results, not reported for brevity, are similar to those shown in Tables 2-8.

(first row): the hypothesis $\beta_2 = -\beta_1$ cannot be rejected in any of the specifications of Table 2.

Turning to the effect of social security, the estimates in columns 2-6 indicate that better public unemployment security (as captured by our measure based on gross replacement rates) is not associated with a significantly different degree of employment insurance by non-family firms (the hypothesis that $\beta_3 = 0$ cannot be rejected); but it is associated with significantly lower provision of insurance by family firms, i.e. a greater sensitivity in their employment to sales shocks ($\beta_4 > 0$). Specifically, in column 2 the coefficient of the interaction between the industry shock, the family-firm dummy and unemployment security is estimated to be statistically significant at the 1 percent confidence level and strongly economically significant. Its magnitude implies that, when the replacement rate is zero (no public insurance provision), family firms offer full insurance against shocks. On the contrary, when the replacement rate is one (full public insurance), family firms hardly offer any more insurance than non-family firms.

In column 3 we test the effect of unemployment security jointly with that of labor market tightness: again, family firms in countries with extensive social security coverage appear to provide less employment insurance; but the coefficient of the interaction between the shock, the family-firm dummy and labor market tightness is not significant, although it remains positive. Column 4 shows the joint effect of unemployment security and financial development. As in column 3, family firms in countries with generous unemployment security provide less employment insurance, although the magnitude and significance of the coefficient are slightly lower than in column 2. The coefficient of the interactions with financial development is not significantly different from zero: the hypothesis that financial development does not impact the demand for insurance by workers cannot be rejected. Column 5 shows that the results survive also in the specification with country-time fixed effects: these absorb the effects arising of country-level aggregate shocks (such as country-specific business cycle fluctuations affecting both firm-level employment and the replacement rate), and thereby eliminate any potential reverse causality from aggregate employment changes to the extent of public unemployment insurance. Finally, column 6 shows that the result that family firms provide more insurance is robust to the inclusion of fixed firm-level effects. When we experiment with different definitions of family firm, all these results remain qualitatively

unchanged, although they are statistically and economically more significant with our strict definition.

Regarding firm-level controls (not reported for brevity), as one would expect there is significantly less employment growth in larger companies and more in companies with higher ROA – more mature companies grow less, more profitable ones invest and grow more. In contrast, leverage and asset tangibility are not significantly correlated with employment growth.

As explained in Section 2.2, these results – based on industry-level shocks – may give a biased measure of firms' employment insurance, because family firms may be less exposed to industry-level sales shocks by selecting less cyclically sensitive projects. To address this issue, Table 3 repeats the estimation with our second definition of the sales shock variable, which is measured at the firm level and captures idiosyncratic variations in sales. The construction of this alternative measure of the sales shocks, and its relative merits compared with industry-level shocks, are explained in Section 2.2. The results of this new estimation are consistent with Table 2: in fact, in Table 3 the significant coefficients are larger in absolute value and more precisely estimated. That is, idiosyncratic shocks to firm-level sales affect employment more severely than industry shocks, although the offset in family firms is equally complete (again, the hypothesis $\beta_2 = -\beta_1$ cannot be rejected). Importantly, also in this table the results continue to hold in the specification that includes country-time fixed effects, although the economic and statistical significance of the coefficients (especially of the interaction term between family firms, shocks and unemployment security) is weaker than in other specifications.

[Insert Table 3]

The estimates reported in Table 3 also confirm the substitutability between the public provision of employment insurance and provision by firms. Interestingly, the estimates indicate that to some extent this substitutability is present also for non-family firms (for instance, in column 2 $\beta_3 = 0.08$, significantly different from zero), although it remains much stronger for family ones (for which in column 2 of the table the estimated effect is $\beta_3 + \beta_4 = 0.08 + 0.22 = 0.30$, very precisely estimated).

To illustrate this substitutability relationship, we re-estimate the regression in column (3) for each of the 41 sample countries (obviously dropping all country-specific

explanatory variables), and compute for each the coefficient ratio $-\beta_2 / \beta_1$, which measures the extent to which family firms stabilize employment relative to the typical firm in their country. This ratio is the reduction in the estimated elasticity of employment to changes in firm sales associated with family firms, as a fraction of its value for all firms in the country. In Figure 3 we plot this country-level measure of the employment insurance provided by family firms against the average unemployment security afforded by the social security system in the respective country. The substitutability between them is conveyed visually by the negative slope of the regression line.

[Insert Figure 3]

We check the robustness of the results shown in Tables 2 and 3 when we use the measure of structural unemployment security instead of the gross replacement rates. If workers' demand for employment stability is likely to be affected only by persistent changes in the provision of public insurance against unemployment risk, then the structural unemployment security measure may be more appropriate because it purges the unemployment security measure of reforms that are in effect only for a short period of time. The results are shown in Tables A1 (using industry shocks) and A2 (using idiosyncratic shocks) in Appendix A. All the core results shown in Tables 2 and 3 are robust to the use of this alternative measure of public unemployment insurance, and the magnitude of the economic and statistical significance of the results shown in Tables A1 and A2 are very similar to those shown in Tables 2 and 3. This provides comfort that our employment insurance results are not dependent on just one measure of the public provision of unemployment insurance.

3.2 Employment insurance or heterogeneity between family and non-family firms?

So far, we have interpreted the stability of employment in the face of sales shocks in family firms as a sign of greater willingness and/or ability to provide job insurance to staff. But there is an alternative explanation, namely that family and non-family firms differ along some other observed or unobserved dimension that gives rise to the difference responses of employment to shocks. For example, they might tend to operate in different industries, with significantly different technologies and/or demand variability. That is, family firms may be disproportionately present in sectors where it is technically easier to

smooth the impact of sales shocks on employment (because, say, inventories have lower storage costs) or where demand shocks are less frequent or less severe (note that this critique does not apply to our measure of idiosyncratic shocks). Another possibility is that family firms may employ more skilled workers or invest more in human capital (via on-the-job training), so that they have a greater disincentive to fire workers in a downturn and try to hire them back in the subsequent upturn; the result is more stable employment.

One problem with these alternative explanations is that they cannot account for the international differences in insurance provided by family firms as a function of the degree of public unemployment insurance. If family firms have distinctive characteristics that are at the root of their different employment policies, it is hard to see why such characteristics should correlate systematically with the national features of social security systems.

To eliminate the potential effect of these characteristics, however, we repeat the estimation on a balanced sample, where each family firm is matched with the two non-family firms with the closest stock market capitalization and cash flow volatility from the same country and industry. The reason for matching each family firm with two non-family ones is that in our sample the ratio of family to non-family firms is very close to one to two. The non-family firms used in the matching comprise only firms in which family blockholders hold less than 5 percent of the cash-flow rights, instead of less than the 25 percent threshold that we use to define non-family firms: this stricter criterion is meant to avoid matching a family firm with one that has a significant family blockholding, e.g. 20%, yet is classified as non-family by our definition. Table A3 in Appendix A reports the mean and median values of financial characteristics of family and non-family firms in the matched sample. For most firm characteristics, matched family firms are not different from non-family firms, the only exceptions being leverage and market-to-book ratio, where the difference is statistically significant at the 10% confidence level. In the specification with the matched sample we continue to control for all firm-level characteristics.

[Insert Table 4]

The results obtained from this matched sample are shown in Table 4. We estimate specification (1) with country-industry or firm fixed effects to identify employment insurance vis-à-vis industry-wide sales shocks (columns 1, 2 and 3), and idiosyncratic shocks (columns 4, 5 and 6). The results from Tables 2 and 3 continue to hold, even when

firm-level fixed effects are included (columns 3 and 6). First, the response of employment to shocks is considerably smaller in family than non-family firms ($\beta_2 < 0$), and this goes for both types of shocks considered. Second, reforms in public unemployment insurance trigger an opposite change in the employment stability provided by firms ($\beta_3 > 0$), especially by family ones ($\beta_4 > 0$): when faced with a reform that decreases the replacement rate, firms – especially family firms – increase the stability of employment. The fact that all the results in Tables 2 and 3 are confirmed indicates that they are not driven by the unequal distribution of family firms across industries with different technology or demand characteristics, or across countries with different characteristics.[9]

The matching method used to obtain the estimates in Table 4 controls for observable differences between family and non-family firms, but does not rule out that our results may be affected by unobserved differences between family and non-family firms. To address this concern, in Table 5 we re-estimate our regressions separately on the two subsamples of firms, using firm-level idiosyncratic shocks to sales. In these regressions, we no longer estimate the difference between family and non- family firms, and only identify how the amount of insurance provided by each type of firm varies with the degree of public insurance. The benefit of this approach is that identification is based only on variation within each firm type, so that the results cannot be due to unobserved heterogeneity between family and non-family firms. When the regressions are estimated on the subsample of family firms only, these are seen again to mitigate the impact of sales shocks in countries and periods in which public unemployment insurance is less generous, as shown by the positive and significant coefficient of the interaction between the shock and unemployment security in the first two columns of Table 5.

[Insert Table 5]

Figure 4 conveys visually the impact that major changes in unemployment security – defined as those when gross replacement rates change by at least 3% from the previous year and are not reversed within the subsequent five years – have on the degree of "pass-

[9] In particular, they are not driven by family firms being disproportionately present in industries with high-skill workers, as labor hoarding implies. This alternative explanation also contrasts with our finding (see Section 3.6) that family firms pay lower wages: since skilled workers typically earn more than unskilled, the labor hoarding hypothesis would require family firms to pay more than non-family firms.

through" of idiosyncratic sales shocks onto employment in family firms.[10] Hence, "pass-through" is an inverse measure of employment stabilization provided by family firms. On the horizontal axis, the figure plots the change in unemployment security S_{ct} triggered by a reform in a given country: for instance, the point "NO02" corresponds to a 2002 reform that reduced the gross replacement rate in Norway from 0.62 to 0.48. On the vertical axis, the figure plots the change in the estimated value of the "pass-through" coefficient β_2 between the 5 years before the reform and the subsequent 5 years (we discard all reforms for which less than 5 years of data before and after are available, to have a sufficient number of data points to estimate the coefficient). The figure shows that most of the reforms that increased unemployment security are associated with an increase in the "pass-through" coefficient β_2, and therefore with a reduction in the unemployment stability offered by family firms (points in Quadrant I). Conversely, all the reforms (except three) that reduced unemployment security are concomitant with a drop in the "pass-through" coefficient, i.e. with greater employment stability provided by family firms (points in Quadrant III of the graph). Hence, Figure 4 confirms that the substitutability between public and private provision of employment stability by family firms persists also when the focus is restricted only to family firms and to the time series dimension generated by major changes in unemployment security, instead of exploiting just cross-country variation as in Figure 3 (where each observation refers to a country for the whole sample period).

[Insert Figure 4]

In contrast, the regressions on the subsample of non-family firms only, reported in columns 3 and 4 of Table 5, show that the employment stabilization provided by these firms is not only much lower than that provided by family firms, but also unresponsive to public unemployment insurance: the coefficients of the interaction between sales shocks and unemployment insurance are not significantly different from zero.

[10] The gross replacement rates in Italy were increased successively in 1997 (increasing rates from 0.1 to 0.28) and 1998 (increasing rates from 0.28 to 0.46). For our analysis shown in Figure 4 we code these two reforms as one (IT98) and use the five years before 1997 and the five years after 1998 for our analysis.

3.3 Distinguishing between positive and negative shocks to sales

Clearly, workers worry about being let go if their employer experiences a drop in sales. So if the coefficients of the interaction variables involving the family-firm dummy actually capture greater provision of job insurance, their explanatory power should stem from the observations of declines in sales. Table 6 re-estimates the employment regressions of Table 2 separately for the observations with negative idiosyncratic sales shocks (Panel A) and those with positive shocks (Panel B).

[Insert Table 6]

The first thing to notice in comparing the two panels is that even the baseline elasticity of employment to idiosyncratic shocks appears to differ. That is, on average all firms reduce their work force more in response to unexpected losses than they increase it when faced with unexpected gains in sales.

Second, family firms appear to stabilize employment completely in response to negative idiosyncratic shocks, while they allow it to respond to some extent to positive shocks, although less than non-family firms. Both results are consistent with the provision of employment insurance. In fact, as the literature on firing costs has shown, if a firm fires less following negative shocks it should also hire less following a positive one, otherwise its workforce would grow unboundedly (Bentolila and Bertola, 1990). However, if firms provide employment insurance, the response will be more muted on the firing margin. Consistently, we find that the substitutability between family-firm employment insurance and unemployment security is more evident and precisely estimated in response to decreases than to increases in sales.

3.4 Distinguishing between transitory and persistent shocks to sales

Gamber (1988) predicts that firms are able to protect workers more against transitory than persistent shocks. Accordingly, in Table 7 we investigate whether persistent and transitory shocks to sales are associated with different degrees of risk-sharing, whether this different response varies between family and non-family firms, and whether for both types of

shocks there is substitutability between the insurance provided by family firms and that supplied by social security.

[Insert Table 7]

Panels A and B of Table 7 show the estimates respectively obtained with transitory and persistent shocks (identified from the respective IV regression, as explained in Appendix B). As expected, firms provide more insurance against transitory than against permanent shocks (the top row coefficients are higher in panel A than in panel B).

In particular, family firms provide full insurance against transitory shocks (the coefficients in the second row of Panel A practically offset those in the top row), but insure only between 32 and 41 percent of persistent shocks (this is computed as the ratio between the absolute value of the coefficients in the second and top rows of Panel B). Moreover, in the case of persistent shocks the estimates are quite imprecise: in the first two specifications, the coefficients in the second row of Panel B are significant only at the 10 percent level, and in the other they are not significantly different from zero.

Consistently with the overall picture, there is substitutability between the employment insurance provided by family firms and by social security against transitory shocks, but not against persistent shocks: family firms do not reduce their insurance against these shocks in response to more public provision of such insurance, because they provide hardly any in the first place!

3.5 Does employment insurance depend on firms' access to finance?

We argued above that the level of insurance provided by firms depends not only on the credibility of their commitment to implicit contracts but also on their access to finance. Berk and Walden (2013) contend that access to capital markets enables firms to offload the risk they assume from workers. This has two implications. First, firms that can easily access financial markets should provide more job insurance than those that cannot. And second, family firms should provide more insurance than non-family firms only when both groups have comparably easy access to financial markets: when neither type of firm can access external finance, their insurance provision should be the same.

Typically, as firms approach a state of distress, they have a harder time getting financing. Hence, we take a firm's "distance" from financial distress as an inverse measure of access to finance. We compute each firm's Altman's *z*-score (see Altman,

1968) in the first three years of their presence in the sample and rank firms in *z*-score quintiles. We then investigate the employment insurance provided in subsequent years by family and non-family firms in the top and bottom quintiles. If our previous results are driven both by family firms' commitment and by their ability to provide insurance, we should find that our results are stronger in the top and weaker or nil in the bottom quintile.

[Insert Table 8]

Table 8 presents estimates of specification (1) with firm fixed effects, separately for the top quintile (columns 1, 3 and 5) and the bottom quintile (columns 2, 4 and 6). The specifications differ depending on the definition of the shock: industry sales in columns 1 and 2, idiosyncratic shocks in columns 3 and 4, and negative industry-level shocks in columns 5 and 6.

The data appear to corroborate both of the above predictions. First, the coefficient of the shock (β_1) is consistently lower in the regressions for firms in the top than in the bottom *z*-score quintile (e.g., column 1 vs. column 2). In other words, the firms with good financial market access attenuate the effect of sales shocks on employment by about one third more than firms with poor access. Second, and more interestingly, family firms stabilize employment much more strongly than non-family firms when they enjoy financial markets access, whereas distressed family firms behave just like non-family firms: in the upper quintile (columns 1, 3, and 5), the employment response to shocks is considerably smaller for the former than for the latter $(\beta_2 < 0)$, and family firm employment does not actually respond at all to industry, idiosyncratic and negative shocks (the hypothesis $\beta_2 = -\beta_1$ cannot be rejected in any of the specifications for these firms). However, the family firms with the least access to finance (columns 2, 4 and 6) provide no more employment stability than non-family firms $(\beta_2 = 0)$. Thirdly, family firms substitute for public unemployment security only when they are not financially distressed (columns 1, 3, and 5, where $\beta_4 > 0$): when they are distressed, the relationship between private and public unemployment insurance vanishes.

These results further corroborate the implicit contract hypothesis. Not only on average family firms provide more employment insurance, but this reflects the different behavior of family and non-family firms *that can access* financial markets, after controlling for firm characteristics and unobserved heterogeneity at the country-industry level. This

indicates that the credibility of family firms' commitment hinges on their ability to deliver employment stability, and so requires them to be financially sound: when they are not, they behave no differently from their non-family analogues, offering little job security, and not substituting for public unemployment insurance.

4. Wage insurance

Clearly, workers do not care only about the stability of employment but also of their wage, which in principle can vary both as a result of renegotiation in the presence of sales shocks and as a result of changes in the hours of overtime work, which is generally better paid than normal work. Therefore, it is important to investigate whether family firms offer more or less wage stability than non-family ones, and whether such stability is systematically related to the provision of public employment insurance. In doing so, we acknowledge the lower quality and coverage of the wage data available in our sample. However, it is important to notice that all our results regarding employment insurance hold also on the subsample of firms for which wage data are available. In this section, we start with a baseline specification similar to that used for employment, first using shocks at the industry level and then at the firm level, as in Section 3.

In Table 9 we investigate wage insurance in the subsample of companies for which at least seven consecutive years of wage data are available, estimating equation (2) and variants of it. The dependent variable is the percentage change of the average real wage in the corresponding firm-year. The standard errors are clustered at the firm level. The results differ markedly from our earlier findings concerning employment insurance.

[Insert Table 9]

First, the coefficient estimates in the top row of Table 9 are considerably lower than those in the top row of Table 2, suggesting the presence of wage stickiness: faced with a sales shock, firms apparently adjust the number of employees more than real wages.

Second, rather than providing more insurance, as in the case of employment, family firms display wider wage fluctuations: the coefficients of the third row are positive and significantly different from zero, at the 1 percent or at the 5 percent level depending on the specification. This result may be explained by the "renegotiation hypothesis" discussed in the introduction: family firms may to be able to get wage concessions from

their employees in response to drops in sales and are ready to raise wages in the case of sales gains. But, since our wage data measure the average wage *per worker* paid in a given firm, this response of wages to sales shocks may simply reflect the fact that in family firms hours worked to sales respond more to sales shocks, i.e. employees are ready to do overtime when the firm faces an abnormally high demand, and reduce their hours worked when demand is weak. Probably owing to this flexibility of their labor force, family firms manage to save jobs in downturns, and therefore provide greater employment stability.

Finally, the estimates shown in Table 9 provide some weak evidence that the wage response of family firms to sales shocks is even larger when the employment insurance provided by social security is more generous, as the relevant coefficient (in the fifth row of the table) is positive in all specifications, although imprecisely estimated: it is significantly different from zero at the 10% level only in column 3. Instead, the degree of financial development does not appear to affect firm-level wage insurance significantly, a result that is in line with those obtained for employment insurance in Section 3.

These results are confirmed also when sales shocks are measured not at the industry level but as idiosyncratic shocks at the firm level, as shown in Table 10. But in this specification the coefficient of the triple interaction between the sales shock, the family firm dummy and unemployment security is not only positive but more precisely estimated than in Table 9: it is significantly different from zero at the 5% level. In other words, in countries and periods in which employees can count on better unemployment security, family firms offer even less wage stability, just as they offer less employment stability.

[Insert Table 10]

As done for employment insurance in Section 3.2, also for wage insurance it is worth checking whether our results are affected by the unequal distribution of family firms across industries with different technology or demand characteristics, or across countries with different characteristics. For this reason, we re-estimate the main specifications in Table 9 and 10 on a matched sample of family and non-family firms, where the matching is done as illustrated in Section 3.2. The results are displayed in Table 11. The results reported in columns 1, 2 and 3 of this table rely on industry sale shocks, and are to be compared with the panel estimates shown in columns 2, 3 and 5 of Table 9, respectively. Symmetrically, the results in columns 4, 5 and 6 of Table 11 are based on firm-level

idiosyncratic shocks and are to be compared to those in columns 2, 3 and 5 of Table 10. The comparison shows that the results obtained on the matched sample confirm all the results obtained from the panel estimates shown in the previous two tables, with the only difference that the response of wages to shocks in family firms appears to be somewhat larger.

[Insert Table 11]

5. Is employment insurance priced by wages?

A central prediction of implicit contract theory is that the insurance provided by firms to their employees should be "priced", i.e. that in exchange for more stable employment and/or wages firms should be able to pay lower salaries. Using French data, Sraer and Thesmar (2007) and Bassanini et al. (2013) confirm that family firms not only stabilize employment but also pay lower wages, but as far as we know, this hypothesis has not been tested for other countries. Therefore in this section we tests whether in our international panel the employment insurance provided by family firms correlates with a lower real wage, controlling for time, country, industry and other firm characteristics, and whether the implicit price of the insurance that they provide is affected by the public provision of unemployment insurance.

[Insert Table 12]

Indeed Table 12 shows that the thesis that family firms pay lower wages is valid more generally around the world. We regress the average real wage paid by a firm in a given year on the family-firm dummy and its interactions with public employment security provisions and financial development, on the usual set of firm-level controls, and country-industry fixed effects. In column 4 we also include firm-level fixed effects, and thus drop the family-firm dummy to avoid perfect collinearity.

The coefficient of the family-firm dummy is negative and significant, implying that the average real wage paid by family firms is approximately 6 to 9 percent lower than the average for the entire sample. This result should be taken cautiously because it could reflect unobservable skill differentials between employees of family and non-family

firms: the wage discount could simply reflect the fact that on average family firms employ less skilled workers.

However, interpreting this wage discount as the "price of employment stability" squares also with the result that the wage discount is larger in countries and periods in which public unemployment insurance is less generous: the estimated coefficient of the interaction of the family-firm dummy with public unemployment security shows that the wage discount is significantly smaller when the social security system provides strong protection against unemployment. This is consistent with our earlier finding that in these circumstances family firms offer less employment insurance: as the public sector provides greater unemployment security, there is less demand for insurance from firms and accordingly the price that workers are willing to pay for it is lower. In other words, the lower demand implies that both the quantity and the price of the insurance provided by family firms declines.

In general, in our sample firms that furnish less employment insurance pay higher real wages. The finding is not restricted to the comparison between family and non-family firms. This is illustrated by Figure 5, which plots the elasticity of employment to firm-level sale shocks against average real wages. To be precise, the measure reported on the horizontal axis is a firm-level estimate of the elasticity of employment to the unexpected component of firm-level sales, controlling for country-industry and time effects and for firm-level variables; the vertical axis gives the residual of a cross-sectional regression of the average real wage on country, time and industry fixed effects (in order to control for country-, time- and industry-related variability in real wages). The relationship is clearly positive, suggesting that firms whose employment responds more sharply to sales shocks compensate their employees with higher wages. The fitted regression line is obtained by regressing the firm-level wage regression residuals (on the vertical axis) on a constant and on the firm-level coefficient of employment sensitivity to idiosyncratic shocks (on the horizontal axis). The t-statistic of the slope coefficient estimate of this regression is 26.07. This confirms that the employment insurance provided by family firms is valued by workers and is priced accordingly by firms: the higher the insurance, the higher the wage discount.

[Insert Figure 5]

6. Conclusion

We investigate the determinants of firms' implicit employment and wage insurance to employees, using a difference-in-difference approach on panel firm-level data from 41 countries: we rely on differences between family and non-family firms to identify the supply of insurance, and on reforms of national public insurance programs to gauge workers' demand for insurance.

Our evidence shows that family firms provide more employment protection than non-family firms, especially in the face of transitory drops in sales, but less wage stability. Moreover, the employment protection provided by family firms is priced: their employees earn 5 percent less on average, controlling for country, industry and time effects.

We also find that family firms offer more job protection in countries where the social security system provides less generous unemployment insurance, or where the rules of the social security system have become more restrictive, in a sense that they generate a lower replacement rate. Moreover, family firms also obtain a larger wage discount when public unemployment insurance is less generous, so that employees are more eager to obtain the additional employment stability that they can offer. Hence, the evidence is consistent with the view that private and public provision of employment insurance are substitutes.

Appendix A: Further Robustness Checks

Table A1. Employment Insurance in Family and Non-Family Firms in Response to Shocks in Industry Sales: International Data

The table presents estimates of a pooled regression for 7,710 firms from 41 countries over the period 1988-2012. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. Δ Industry Sales is the yearly change of log sales of each industry *j* in year *t* excluding the log sales of firm *i* from the calculation; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Structural Unemployment Security is the persistent component of the gross replacement rate in each country (defined as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings); Labor Market Tightness is measured as the reciprocal of the ratio of long term unemployment (persisting for one year or longer) to total unemployment (only for the OECD countries); Financial Development is the ratio of stock market capitalization to GDP; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). The specification shown in column 5 also includes the variables Financial Development, and Family Firms × Financial Development (not reported). T-statistics are reported in parenthesis. Standard errors are clustered at the firm level. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	(2)	(3)	(4)	(5)
Δ Industry Sales	0.1889***	0.1752***	0.1585***	0.1498***	0.1988***
	(3.59)	(3.41)	(3.34)	(3.25)	(3.70)
Family Firms	0.0051	0.0052	0.0049	0.0042	-
	(1.04)	(1.03)	(0.95)	(1.10)	
Δ Industry Sales × Family Firms	-0.1672***	-0.1687***	-0.1576***	-0.1224**	-0.1802***
	(-3.39)	(-3.07)	(-2.91)	(-2.48)	(-3.41)
Δ Industry Sales × Structural Unemployment Security	0.0344	0.0371	0.0369	0.0291	0.0390
	(1.47)	(1.45)	(1.28)	(0.92)	(1.04)
Δ Industry Sales × Family Firms × Structural Unempl. Security	0.1570***	0.1584***	0.1430**	0.0913**	0.1178**
	(2.92)	(2.74)	(2.49)	(2.09)	(2.30)
Family Firms × Structural Unemployment Security	0.0022	0.0011	-0.0001	-0.0001	-0.0021
	(1.09)	(0.92)	(-0.58)	(-0.37)	(-0.51)
Δ Industry Sales × Labor Market Tightness		0.0056			
		(1.12)			
Δ Industry Sales × Family Firms × Labor Market Tightness		0.0143			
		(1.31)			
Family Firms × Labor Market Tightness		0.0012			
		(1.14)			
Δ Industry Sales × Financial Development			0.0011		
			(1.00)		
Δ Industry Sales × Family Firms × Financial Development			-0.0013		
			(-1.12)		
Structural Unemployment Security	0.0157	0.0114	0.0197		-0.0082
	(1.25)	(1.09)	(1.06)		(-0.85)
Labor Market Tightness		-0.0011			
		(-0.49)			
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-	Country-	Country-	Country-	Firm
Year Fixed Effects	Yes	Yes	Yes	No	Yes
R^2	0.21	0.24	0.20	0.28	0.26
Number of Observations	115,827	97,922	115,827	115,827	115,827

Table A2. Employment Insurance in Family and Non-Family Firms in Response to Shocks in Firm-Level Sales: International Data

The table presents estimates of a pooled regression for 7,710 firms from 41 countries over the period 1988-2012. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. Idiosyncratic Shock is the residual from a first-stage GMM regression estimated with the Arellano-Bond method that explains the first difference of the log of sales of firm *i* in year *t*; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Structural Unemployment Security is the persistent component of the gross replacement rate in each country (defined as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings); Labor Market Tightness is the reciprocal of the ratio of long term unemployment (which persists for one year or longer) over total unemployment (only for OECD countries); Financial Development is the ratio of stock market capitalization to GDP; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). The specification in column 5 also includes the variables Financial Development, and Family Firms × Financial Development (not reported). Bootstrapped standard errors are used in each specification. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Idiosyncratic Shock	0.2911***	0.2672***	0.2462***	0.2310***	0.3025***
	(3.72)	(3.51)	(3.09)	(2.97)	(3.21)
Family Firms	0.0062	0.0057	0.0051	0.0047	-
	(1.69)	(1.53)	(1.40)	(1.50)	
Idiosyncratic Shock × Family Firms	-0.2795***	-0.2418***	-0.2228***	-0.2011**	-0.2522***
	(-3.62)	(-3.45)	(-3.01)	(-2.30)	(-2.87)
Idiosyncratic Shock × Structural Unempl. Security	0.0944**	0.0688*	0.0702*	0.0591*	0.0605*
	(2.15)	(1.80)	(1.91)	(1.75)	(1.80)
Idiosyncratic Shock × Family Firms × Struct. Unempl. Security	0.2081***	0.1756***	0.1547***	0.1159*	0.1816**
	(3.19)	(2.95)	(2.76)	(1.71)	(2.49)
Family Firms × Structural Unemployment Security	0.0141	0.0137	0.0142	-0.0019	-0.0045
	(1.53)	(1.34)	(1.37)	(-0.82)	(-1.01)
Idiosyncratic Shock × Labor Market Tightness		0.0077**			
		(2.11)			
Idiosyncratic Shock × Family Firms × Labor Market Tightness		0.0236*			
		(1.84)			
Family Firms × Labor Market Tightness		0.0014			
		(1.46)			
Idiosyncratic Shock × Financial Development			0.0012*		
			(1.89)		
Idiosyncratic Shock × Family Firms × Financial Development			0.0009*		
			(1.75)		
Structural Unemployment Security	0.0188*	0.0175*	0.0182		-0.0160*
	(1.77)	(1.72)	(1.60)		(1.72)
Labor Market Tightness		0.0004			
		(1.02)			
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Firm
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.27	0.29	0.25	0.30	0.32
Number of Observations	115,827	97,922	115,827	115,827	115,827

Table A3. Descriptive Statistics of the Matched Sample

The table presents the mean and median values of the firm-level financial variables for family and non-family firms in the matched sample. Family firms are matched with non-family firms with the closest stock market capitalization and cash flow volatility from the same country and industry. Total Assets and Market Capitalization are in millions of US$; Capital expenditure is the ratio of capital expenditure to (lagged) total assets; Profitability is the ratio of operating profits to total assets; Leverage is the ratio of total debt to total assets; Market to Book is the ratio of the market value of equity to the book value of equity; Asset Tangibility is the ratio of plant, property and equipment to total assets; and Beta is the correlation of the firm's with the local stock market's returns. Asterisks (*, and **) indicate statistical significance (at the 10%, 5%, respectively) of the difference in the average values between family and non-family firms.

	Family Firms		**Non Family Firms**	
	Mean	**Median**	**Mean**	**Median**
Total Assets	1,756	351	1,902	392
Market Capitalization	2,379	428	2,705	454
Capital Investments	0.067	0.058	0.062	0.051
Profitability	0.056	0.063	0.062	0.068
Leverage	0.26*	0.21	0.24	0.20
Market to Book ratio	1.38*	1.24	1.47	1.31
Asset Tangibility	0.44	0.39	0.42	0.38
Beta	0.91	0.83	0.96	0.86

Appendix B: Estimating the persistent and transitory components of sales shocks

This appendix shows how the persistent and transitory components of sales shocks are obtained, disregarding – initially – the cross-country component and also the distinction between family and non-family firms.

We assume the following stochastic process for firm sales:

$$s_{it} = \mu_i + \mu_{cjt} + \lambda X_{it} + \varepsilon_{it}, \quad (4)$$

where s_{it} is the logarithm of the sales of firm *i* in industry *j* in year *t*, μ_i is a firm fixed effect, μ_{cjt} is a country-industry-year dummy, X_{it} are other controls and ε_{it} is a shock to firm *i*'s sales, which we can decompose into a persistent and a transitory component as follows:

$$\varepsilon_{it} = \zeta_{it} + v_{it}, \quad (5)$$

$$\zeta_{it} = \zeta_{it-1} + u_{it}, \quad (6)$$

where ζ_{it} is the persistent component, modeled as a random walk, and v_{it} the transitory component of sales innovations. This is a simpler version of Guiso, Pistaferri and Schivardi (2005), where s_{it} and v_{it} are respectively modeled as AR(1) and MA(1) processes.

Employment is assumed to respond to persistent and transitory shocks with different sensitivities α and β:

$$n_{it} = \mu_i + \alpha\zeta_{it} + \beta v_{it} + \gamma W_{it} + \psi_{it}, \quad (7)$$

where μ_i is a firm fixed effect, W_{it} are other controls, and ψ_{it} is an idiosyncratic shock to employment uncorrelated with ζ_{it} and v_{it}.

Sensitivities α and β are estimated in three steps. First, the first differences of (4) are computed and the resulting sales growth regression is estimated:

$$\Delta s_{it} = \Delta\mu_{jct} + \lambda\Delta X_{it} + \Delta\varepsilon_{it}, \quad (8)$$

so as to recover an estimate of $\Delta\varepsilon_{it}$, without directly identifying the persistent and the transitory shocks. Second, the first differences of (7) are computed and the resulting employment growth regression is estimated:

$$\Delta n_{it} = \gamma\Delta W_{it} + \alpha u_{it} + \beta\Delta v_{it} + \Delta\psi_{it} = \gamma\Delta W_{it} + \Delta\omega_{it}, \qquad (9)$$

using $\Delta\zeta_{it} = u_{it}$ from (6), and re-defining the error term as $\Delta\omega_{it} \equiv \alpha u_{it} + \beta\Delta v_{it} + \Delta\psi_{it}$.

Finally, since $\Delta\varepsilon_{it} = u_{it} + \Delta v_{it}$, the coefficients α and β are recovered by estimating two separate IV regressions of $\Delta\omega_{it}$ on $\Delta\varepsilon_{it}$. Specifically, as shown by Guiso, Pistaferri and Schivardi (2005), a regression of $\Delta\omega_{it}$ on $\Delta\varepsilon_{it}$ with the latter instrumented by $\Delta\varepsilon_{it+1}$ and its powers identifies the transitory shock coefficient β, while a regression of $\Delta\omega_{it}$ on $\Delta\varepsilon_{it}$ with the latter instrumented by $\Delta\varepsilon_{it+1} + \Delta\varepsilon_{it} + \Delta\varepsilon_{it-1}$ and its powers identifies the persistent shock coefficient α.

To estimate a different coefficient for family firms, we just include in the regression the interaction between the family-firm dummy F_i and the shocks, and, among the instruments, the interaction between the original instruments just described and the F_i dummy.

References

Agrawal, Ashwini K., and David A. Matsa (2013), "Labor Unemployment Risk and Corporate Financing Decisions," *Journal of Financial Economics* 108, 449–470.

Aleksynska, Mariya, and Martin Schindler (2011), "Labor Market Regulations in Low-, Middle- and High-Income Countries: A New Panel Database," IMF Working Paper No. 11/154.

Altman, Edward I. (1968), "Financial Ratios, Discriminant Analysis, and the Prediction of Corporate Bankruptcy," *Journal of Finance* 23, 589–609.

Azariadis, Costas "Implicit Contracts and Underemployment Equilibria" *Journal of Political Economy*, 83, 1183-12002.

Bach, Laurent, and Nicolas Serrano-Velarde (2010), "The Power of Dynastic Commitment," *Journal of Corporate Finance*, forthcoming.

Baily, Martin Neil (1974), "Wages and Employment under Uncertain Demand," *Review of Economic Studies* 41, 37-50.

Bassanini, Andrea, Eve Caroli, Antoine Rebérioux, and Thomas Breda (2013), "Working in Family Firms: Less Paid but More Secure? Evidence from French Matched Employer-Employee Data," *Industrial and Labor Relations Review* 66, 433-466.

Bentolila, Samuel, and Giuseppe Bertola (1990), "Firing Costs and Labour Demand: How Bad is Eurosclerosis?," *The Review of Economic Studies* 57, 381-402.

Berk, Jonathan B., and Johan Walden (2013), "Limited Capital Market Participation and Human Capital Risk," *Review of Asset Pricing Studies* 3(1), 1-37.

Caggese, Andrea, and Vicente Cuñat (2008), "Financing Constraints and Fixed-Term Employment Contracts," *Economic Journal* 118, 2013-2046.

Cardoso, Ana Rute, and Miguel Portela (2009), "Micro Foundations for Wage Flexibility: Wage Insurance at the Firm Level," *Scandinavian Journal of Economics* 111(1), 29-50.

D'Aurizio, Leandro, and Livio Romano (2013), "Family Firms and the Great Recession: Out of Sight, Out of Mind?" Bank of Italy Working Paper No. 905, April.

Gamber, Edward N. (1988), "Long-Term Risk-Sharing Wage Contracts in an Economy Subject to Permanent and Temporary Shocks," *Journal of Labor Economics* 6, 83-99.

Guertzgen, Nicole (2013), "Wage Insurance within German Firms: Do Institutions Matter?" *Journal of the Royal Statistical Society - Series A*, forthcoming.

Guiso, Luigi, Luigi Pistaferri, and Fabiano Schivardi (2005), "Insurance within the Firm," *Journal of Political Economy* 113(5), 1054-1087.

Kàtai, Gàbor (2008), "Do Firms Provide Wage Insurance Against Shocks? Evidence from Hungary," MNB Working Paper 2008/8.

Kim, E. Han, Ernst Maug, and Christoph Schneider (2011), "Labor Representation in Governance as an Insurance Mechanism," unpublished manuscript.

Lins, Karl, Paolo Volpin and Hannes Wagner (2013), "Does Family Control Matter? International Evidence from the 2008-2009 Financial Crisis," *Review of Financial Studies* 26, 2583-2619.

Mueller, Holger M., and Thomas Philippon (2011), "Family Firms and Labor Relations," *American Economic Journal: Macroeconomics* 3(2), 218-45.

Sharpe, Steven A. (1994), "Financial Market Imperfections, Firm Leverage, and the Cyclicality of Employment", *American Economic Review* 84 (4), 1060-1074.

Shleifer, Andrei and Lawrence H. Summers (1988), "Breach of Trust in Hostile Takeovers," in *Corporate Takeovers: Causes and Consequences*, A. J. Auerbach, ed., University of Chicago Press, 33-68.

Sraer, David, and David Thesmar (2007), "Performance and Behavior of Family Firms: Evidence From the French Stock Market" 5(4), *Journal of the European Economic Association*.

Topel, Robert H., and Welch, Finis (1980), "Unemployment Insurance: Survey and Extensions," *Economica* 47, 351–379.

Topel, Robert H. (1983), "On Layoffs and Unemployment Insurance," *American Economic Review* 73(4), 541–559.

Topel, Robert H. (1984), "Equilibrium Earnings, Turnover, and Unemployment: New Evidence," *Journal of Labor Economics* 2(4), 500–522.

Waxin, Timothée (2009), "The Impact of Founding-Family Ownership on Labor Relations: Evidence from French Workplace-Level Data," unpublished manuscript.

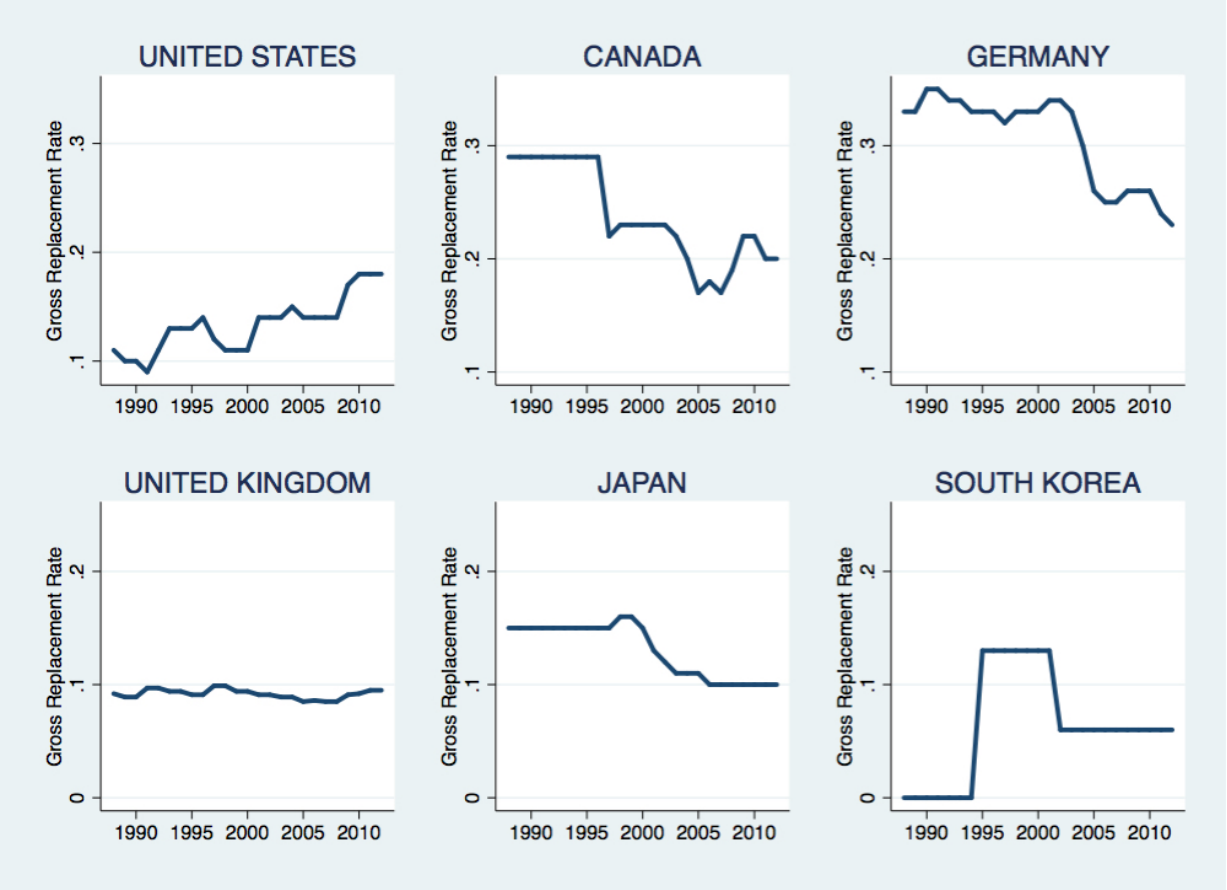

Figure 1. Gross Replacement Rates for the Six Major Countries by Continent

The figure shows the gross replacement rates for the two countries with the largest number of firms in each of three continents: the United States and Canada (for the Americas), Germany and the United Kingdom (for Europe), and Japan and South Korea (for Asia). Gross replacement rates (GRR) are calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings.

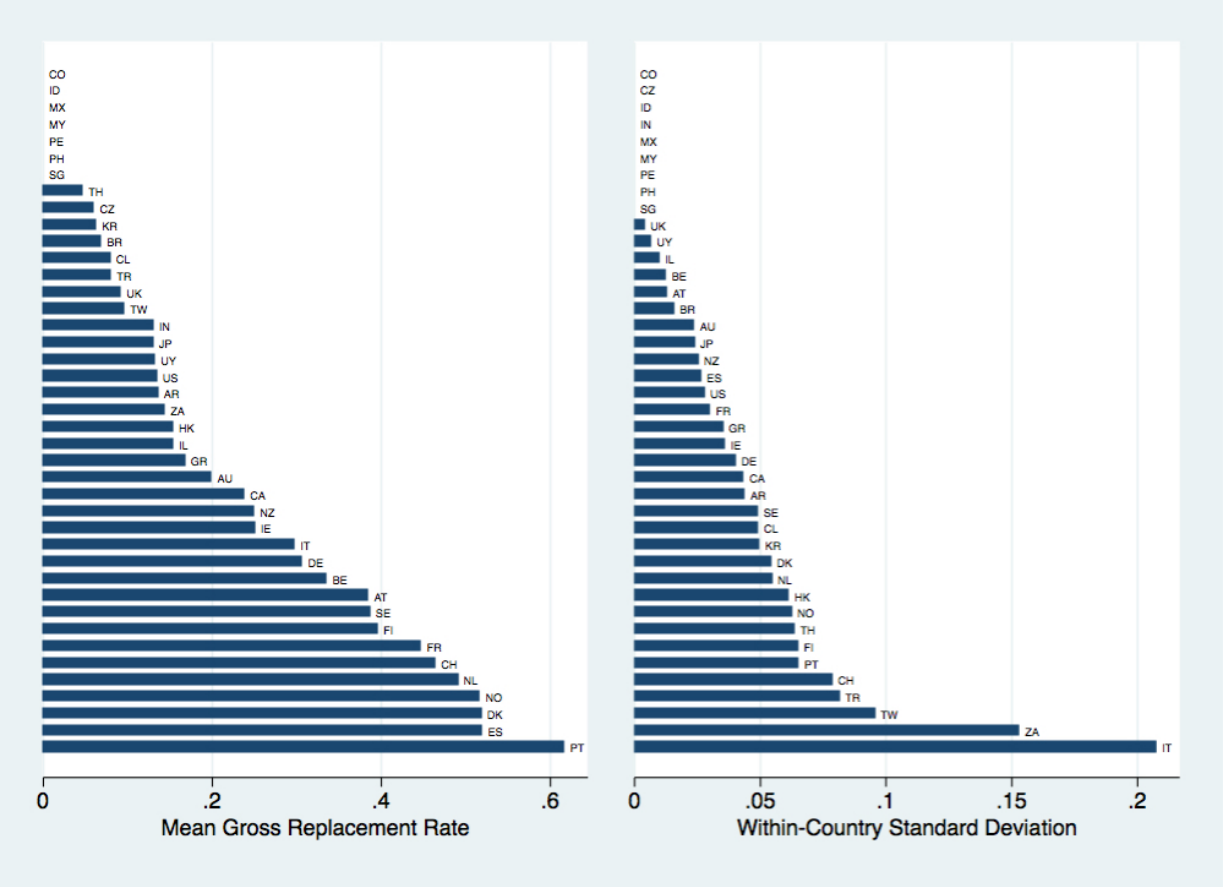

Figure 2. Mean and Standard Deviation of the Gross Replacement Rates, by Country

The figure shows the within-country, over time average (left panel) and standard deviation (right panel) of the gross replacement rates for all the countries in our sample over the period 1988-2012. Gross replacement rates are calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings.

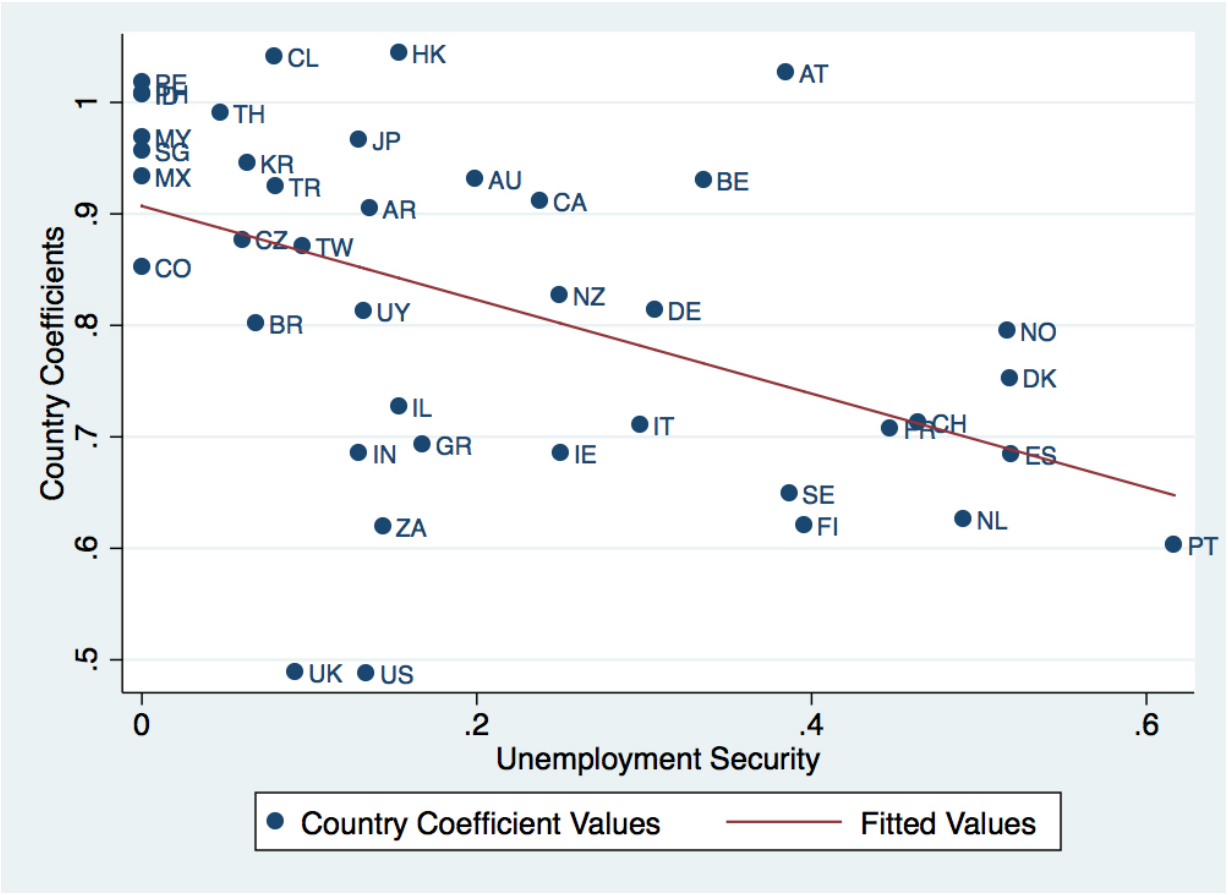

Figure 3. Employment Insurance in Family Firms and Public Unemployment Security

The variable shown on the horizontal axis is unemployment security in each country as measured by the gross replacement rate, i.e. the ratio between the unemployment insurance benefits received by a worker in the first two years of unemployment relative and the worker's last gross earning. The measure reported on the vertical axis is a country-level measure of employment insurance provided by family firms relative to non-family ones, estimated as the percentage reduction in the elasticity of employment to firm-level sales shocks associated with family firms.

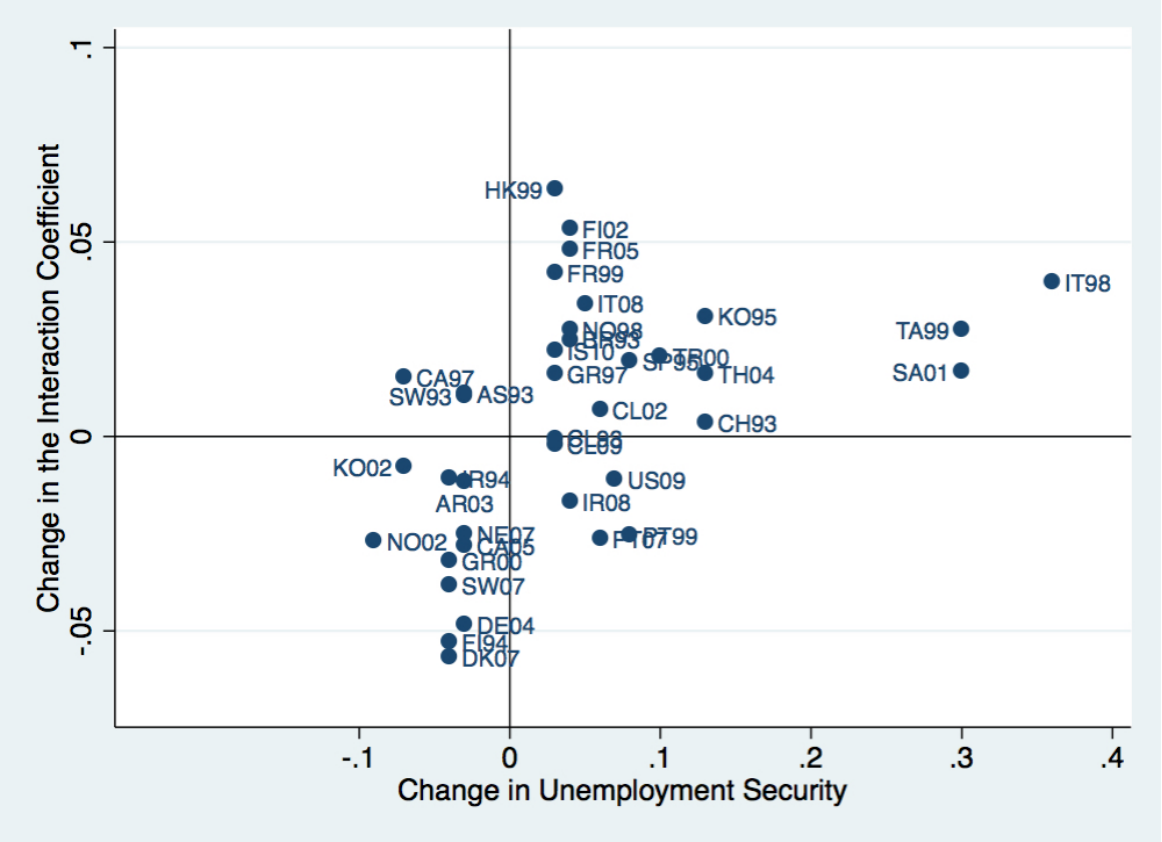

Figure 4. Employment Insurance in Family Firms Following Major Reforms in Unemployment Security

The variable shown on the horizontal axis is the change in the degree of "pass-through" of idiosyncratic sales shocks onto employment in family firms around the reform in the unemployment security in a given country. It is measured as the difference between the coefficient that measures employment stabilization in family firms in the five years before the reform of the gross replacement rate (calculated as the ratio between the unemployment insurance benefits received by a worker in the first two years of unemployment relative and the worker's last gross earning) and the five years after. On the horizontal axis, the figure plots the change in unemployment security triggered by a reform in a given country.

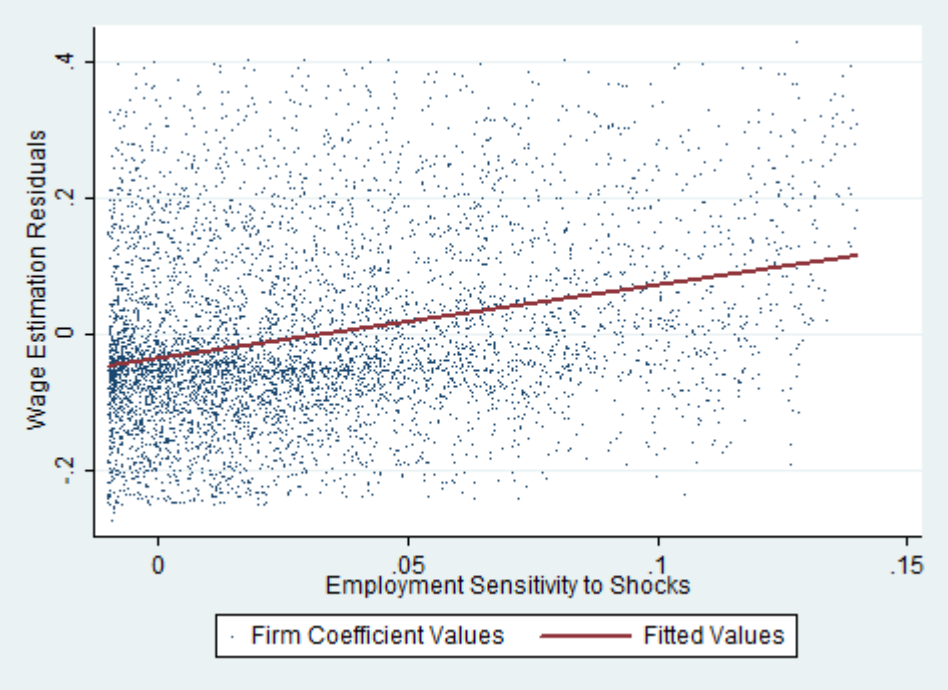

Figure 5. Employment Sensitivity to Firm-Level Sale Shocks and Average Real Wage

The measure reported on the horizontal axis is a firm-level estimate of the elasticity of employment to the unexpected component of firm-level sales, controlling for country-industry and time fixed effects and for firm-level variables. The variable shown on the vertical axis is the residual of a cross-sectional regression of the average real wage on fixed country, time and industry fixed effects.

Table 1. Descriptive Statistics

Column 1 reports the number of non-family firms in each country in our sample. Column 2 reports the number of family firms in each country in our sample. Columns 3 and 4 report the average annual sales growth of non-family and family firms respectively, over the sample period from 1988 to 2012. Columns 5 and 6 report the average total firm-level number of employees of non-family and family firms respectively over the same sample period. Column 7 reports the average (over time) gross replacement rate, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross in each country of the sample, using the method of Aleksynska and Schindler (2011). Column 8 reports the coefficient of variation of the gross replacement rate, i.e. the ratio of its standard deviation for each country divided by the respective mean. Column 9 reports the average (over time) ratio of long term unemployment (persisting for one year or longer) to total unemployment for the OECD countries.

	Number of Non-Family Firms	**Number of Family Firms**	**Sales Growth of Non-Family Firms**	**Sales Growth of Family Firms**	**Employment of Non-Family Firms**	**Employment of Family Firms**	**Gross Replacement Rates**	**Coefficient of Variation of**	**Fraction of Long Term Unemployed**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Argentina	9	18	0.07	0.09	3,859	2,207	0.136	0.322	-
Australia	365	102	0.09	0.12	6,540	1,844	0.199	0.119	0.2122
Austria	39	27	0.10	0.09	4,843	2,881	0.385	0.034	0.2448
Belgium	30	21	0.08	0.10	5,073	2,948	0.336	0.038	0.4889
Brazil	33	76	0.10	0.14	9,135	3,122	0.068	0.230	-
Canada	282	53	0.07	0.08	9,571	3,025	0.238	0.182	0.0984
Chile	12	19	0.12	0.13	3,601	1,949	0.079	0.621	-
Colombia	8	14	0.10	0.14	3,102	1,822	0.000	.	-
Czech Republic	15	14	0.10	0.12	3,218	1,043	0.060	0.000	0.4845
Denmark	40	25	0.08	0.07	4,929	2,186	0.518	0.105	0.1926
Finland	63	53	0.09	0.10	6,011	2,107	0.396	0.164	0.2567
France	312	179	0.10	0.08	10,092	6,090	0.447	0.067	0.3980
Germany	349	210	0.11	0.09	12,057	6,221	0.306	0.131	0.4811
Greece	8	19	0.04	0.05	3,214	1,879	0.168	0.210	0.4405
Hong Kong	38	78	0.12	0.15	7,180	8,085	0.154	0.399	-
India	102	97	0.14	0.14	8,217	6,149	0.130	0.000	-
Indonesia	11	19	0.08	0.10	3,218	3,409	0.000	.	-
Ireland	45	11	0.06	0.05	5,045	2,110	0.250	0.143	0.3752
Israel	49	57	0.09	0.08	4,379	2,815	0.154	0.065	0.2733
Italy	61	95	0.07	0.07	9,021	5,144	0.298	0.697	0.5142
Japan	783	104	0.09	0.07	11,207	2,135	0.130	0.184	0.3825
Malaysia	16	34	0.07	0.05	3,745	2,497	0.000	.	-

Mexico	29	48	0.09	0.05	9,441	5,901	0.000	.	0.0219
Netherlands	46	27	0.08	0.06	9,624	7,280	0.491	0.111	0.3498
New Zealand	27	8	0.11	0.07	2,724	1,244	0.250	0.102	0.1316
Norway	80	40	0.09	0.09	3,598	1,655	0.517	0.121	0.0909
Peru	8	10	0.08	0.09	1,605	982	0.000	.	-
Philippines	28	41	0.09	0.10	3,072	1,805	0.000	.	-
Portugal	22	30	0.05	0.06	3,833	1,788	0.617	0.106	0.4279
Singapore	21	34	0.14	0.15	9,314	5,211	0.000	.	-
South Africa	29	15	0.12	0.09	6,221	2,519	0.144	1.062	-
South Korea	78	154	0.12	0.13	6,512	8,912	0.063	0.792	0.0205
Spain	195	143	0.10	0.07	9,771	5,209	0.520	0.051	0.2941
Sweden	89	57	0.09	0.08	9,283	7,081	0.387	0.127	0.1962
Switzerland	114	59	0.10	0.08	11,409	7,108	0.464	0.170	0.2850
Taiwan	65	56	0.14	0.12	5,740	4,911	0.096	0.996	-
Thailand	39	72	0.10	0.13	4,976	3,192	0.047	1.361	-
Turkey	36	16	0.10	0.12	4,287	2,210	0.080	1.020	0.2652
United Kingdom	703	111	0.07	0.09	10,956	1,540	0.092	0.045	0.2767
United States	1065	101	0.07	0.08	15,972	1,580	0.134	0.207	0.1142
Uruguay	7	12	0.08	0.10	1,091	822	0.132	0.050	-
Number of Firms	5,351	2,359							
Average Values			0.092	0.094	6,504	3,478	0.207	0.295	0.281

Table 2. Employment Insurance in Family and Non-Family Firms in Response to Shocks in Industry Sales

The table presents estimates of a pooled regression for 7,710 firms from 41 countries over the period 1988-2012. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. Δ Industry Sales is the yearly change of log sales of each industry *j* in year *t* excluding the log sales of firm *i* from the calculation; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Labor Market Tightness is measured as the reciprocal of the ratio of long term unemployment (persisting for one year or longer) to total unemployment (only for the OECD countries); Financial Development is the ratio of stock market capitalization to GDP; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). The specification shown in column 5 also includes the variables Financial Development, and Family Firms × Financial Development (not reported). T-statistics are reported in parenthesis. Standard errors are clustered at the firm level. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	(2)	(3)	(4)	(5)	(6)
Δ Industry Sales	0.198***	0.185***	0.176***	0.181***	0.140***	0.165***
	(4.10)	(3.71)	(3.29)	(3.42)	(3.10)	(3.00)
Family Firms	0.005	0.004	0.003	0.003	0.003	-
	(1.44)	(1.28)	(0.97)	(1.10)	(1.06)	
Δ Industry Sales × Family Firms	-0.182***	-0.177***	-0.159***	-0.164***	-0.124**	-0.151***
	(-4.44)	(-3.87)	(-3.44)	(-3.59)	(-2.51)	(-3.02)
Δ Industry Sales × Unemployment Security		0.038	0.043	0.044	0.037	0.044
		(1.58)	(1.50)	(1.27)	(1.11)	(1.24)
Δ Industry Sales × Family Firms × Unemployment Security		0.140***	0.118***	0.125***	0.099**	0.114**
		(3.22)	(2.77)	(2.79)	(2.48)	(2.38)
Family Firms × Unemployment Security		0.009	0.008	-0.001	-0.001	-0.003
		(1.27)	(0.83)	(-0.45)	(-0.39)	(-0.61)
Δ Industry Sales × Labor Market Tightness			0.005			
			(1.19)			
Δ Industry Sales × Family Firms × Labor Market Tightness			0.015			
			(1.44)			
Family Firms × Labor Market Tightness			0.001			
			(1.18)			
Δ Industry Sales × Financial Development				0.001		
				(1.09)		
Δ Industry Sales × Family Firms × Financial Development				-0.001		
				(-0.92)		
Unemployment Security		0.017	0.012	0.021		-0.009
		(1.46)	(1.23)	(1.14)		(-0.98)
Labor Market Tightness			-0.001			
			(-0.97)			
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Time	Firm
Year Fixed Effects	Yes	Yes	Yes	Yes	No	Yes
R^2	0.21	0.22	0.24	0.21	0.27	0.25
Number of Observations	115,827	115,827	97,922	115,827	115,827	115,827

Table 3. Employment Insurance in Family and Non-Family Firms in Response to Idiosyncratic Shocks in Firm Sales

The table presents estimates of a pooled regression for 7,710 firms from 41 countries over the period 1988-2012. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. Idiosyncratic Shock is the residual from a first-stage GMM regression estimated with the Arellano-Bond method that explains the first difference of the log of sales of firm *i* in year *t*; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Labor Market Tightness is the reciprocal of the ratio of long term unemployment (which persists for one year or longer) over total unemployment (only for OECD countries); Financial Development is the ratio of stock market capitalization to GDP; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). The specification in column 5 also includes the variables Financial Development, and Family Firms × Financial Development (not reported). Bootstrapped standard errors are used in each specification. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	(2)	(3)	(4)	(5)	(6)
Idiosyncratic Shock	0.3125***	0.2806***	0.2451***	0.2580***	0.2580***	0.3009***
	(4.03)	(3.70)	(3.02)	(3.29)	(3.27)	(3.25)
Family Firms	0.0080*	0.0067*	0.0055	0.0054	0.0051	-
	(1.89)	(1.71)	(1.52)	(1.60)	(1.57)	
Idiosyncratic Shock × Family Firms	-0.2926***	-0.2708***	-0.2033***	-0.2337***	-0.2137**	-0.2611***
	(-3.90)	(-3.51)	(-2.80)	(-3.20)	(-2.39)	(-2.94)
Idiosyncratic Shock × Unemployment Security		0.0839**	0.0709*	0.0780**	0.0612*	0.0697**
		(2.11)	(1.92)	(2.01)	(1.80)	(2.05)
Idiosyncratic Shock × Family Firms × Unemployment Security		0.2172***	0.1925***	0.1980***	0.1280*	0.1923**
		(3.52)	(2.92)	(3.40)	(1.74)	(2.52)
Family Firms × Unemployment Security		0.0160*	0.0141	0.0153	-0.0019	-0.0046
		(1.72)	(1.37)	(1.42)	(-0.81)	(-1.02)
Idiosyncratic Shock × Labor Market Tightness			0.0080**			
			(2.15)			
Idiosyncratic Shock × Family Firms × Labor Market Tightness Tightness			0.0248*			
			(1.87)			
Family Firms × Labor Market Tightness			0.0015			
			(1.47)			
Idiosyncratic Shock × Financial Development				0.0015**		
				(2.09)		
Idiosyncratic Shock × Family Firms × Financial Development				0.0011*		
				(1.87)		
Unemployment Security		0.0202*	0.0188*	0.0194*		-0.0168*
		(1.91)	(1.80)	(1.81)		(1.80)
Labor Market Tightness			0.0004			
			(1.02)			
Other Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Time	Firm
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.15	0.16	0.18	0.19	0.24	0.26
Number of Observations	115,827	115,827	97,922	115,827	115,827	115,827

Table 4. Employment Insurance in Family and Non-Family Firms in Response to Shocks in a Matched Sample

The table presents estimates of a pooled regression model for family firms and their non-family matches from 41 countries over the period 1988-2012. We match each family firm with a non-family firm with the closest stock market capitalization and cash flow volatility from the same country and industry. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. The shocks used are as follows: in columns 1-3 we use the yearly change of log sales of each industry *j* in year *t* excluding the log sales of firm *i* from the calculation; in columns 4-6 we use the idiosyncratic shock to sales, defined as the residual from a first-stage GMM regression estimated with the Arellano-Bond method that explains the first difference of the log of sales of firm *i* in year *t*. The other independent variables are as follows: Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder which is present in the firm's management and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). Standard errors in specifications shown in columns 1-3 are clustered at the firm level. Bootstrapped standard errors are used in the specifications shown in columns 4-6. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	Industry Shocks			**Idiosyncratic Shocks**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Shock	0.2072***	0.1799***	0.1911***	0.3164***	0.3087***	0.3378***
	(3.05)	(2.91)	(3.15)	(3.60)	(3.21)	(3.89)
Family Firms	0.0051	0.0043		0.0089	0.0074	
	(1.27)	(1.09)		(1.02)	(0.95)	
Shock × Family Firms	-0.1852***	-0.1608***	-0.1756***	-0.2829***	-0.2751***	-0.3075***
	(-3.27)	(-2.95)	(-2.87)	(-3.73)	(-3.26)	(-3.01)
Shock × Unemployment Security		0.0410*	0.0327		0.0403	0.0324
		(1.72)	(1.30)		(1.47)	(1.32)
Shock × Family Firms × Unemployment Security		0.1521***	0.1248**		0.2610***	0.2423***
		(3.24)	(2.49)		(3.19)	(2.81)
Family Firms × Unemployment Security		0.0102	-0.0028		0.0176	0.0050
		(1.31)	(-0.72)		(1.50)	(0.92)
Unemployment Security		0.0187	-0.0103		0.0321*	0.0183
		(1.49)	(-1.07)		(1.71)	(1.01)
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Firm	Country-Industry	Country-Industry	Firm
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.29	0.32	0.41	0.18	0.20	0.29
Number of Observations	86,511	86,511	86,511	86,511	86,511	86,511

Table 5. Employment Insurance in Family and Non-Family Firms in Response to Idiosyncratic Shocks in Firm Sales

The table presents estimates of a panel regression model for family firms only, shown in columns 1-2, and non-family firms only, shown in columns 3-4. The firms come from 41 countries over the period 1988-2012. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. Idiosyncratic Shock is the residual from a first-stage GMM regression estimated with the Arellano-Bond method that explains the first difference of the log of sales of firm *i* in year *t*; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Financial Development is the ratio of stock market capitalization to GDP; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). Bootstrapped standard errors are used in each specification. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	Family Firms		**Non Family Firms**	
	(1)	**(2)**	**(3)**	**(4)**
Idiosyncratic Shock	0.0128	0.0115	0.2839***	0.2711***
	(0.29)	(0.11)	(3.28)	(3.12)
Idiosyncratic Shock × Unemployment Security	0.1175***	0.1082***	0.0544	0.0498
	(3.25)	(2.98)	(1.18)	(1.02)
Unemployment Security	0.0134**	0.0107*	0.0102*	0.0094*
	(1.98)	(1.87)	(1.86)	(1.70)
Idiosyncratic Shock × Financial Development		-0.0011*		-0.0008
		(-1.92)		(-1.50)
Financial Development		-0.0001		-0.0001
		(-1.37)		(-1.39)
Firm-level Control Variables	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Year Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.35	0.38	0.41	0.42
Number of Observations	40,109	40,109	75,718	75,718

Table 6. Employment Insurance in Family and non-Family Firms in Response to Positive and Negative Idiosyncratic Shocks in Firm Sales

The table presents estimates of a pooled regression model for 7,710 firms from 41 countries over the period from 1988 to 2012. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. In Panel A we show the results of the pooled regressions for years with negative idiosyncratic shocks. In Panel B we show the results of the pooled regressions for years with positive idiosyncratic shocks. The independent variables are as follows: Idiosyncratic Shock is defined as the residual from a first-stage GMM regression estimated with the Arellano-Bond method that explains the first difference of the log of sales of firm *i* in year *t*; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Financial Development is the ratio of stock market capitalization to GDP. Firm-level control variables are the following: Firm Size measured as the log of market capitalization of each firm *i* in year *t-1*; Asset Tangibility measured as the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t-1*; Return on Assets measured as the return on total assets of each firm *i* in year *t-1*; and Leverage measured as the ratio of total debt to total assets of each firm *i* in year *t-1*. The specification shown in column 3 also includes the variables Financial Development, and Family Firms × Financial Development (not reported). Bootstrapped standard errors are used in each specification. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

Panel A: Negative Shocks	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Idiosyncratic Shock	0.327*** (3.21)	0.310*** (2.99)	0.304*** (2.88)	0.2809*** (2.65)	0.322*** (3.31)
Family Firms	0.004 (0.94)	0.003 (0.82)	0.002 (0.75)	0.001 (0.059)	-
Idiosyncratic Shock × Family Firms	-0.341*** (-2.87)	-0.298*** (-2.73)	-0.288** (-2.49)	-0.267** (-2.23)	-0.278** (-2.44)
Idiosyncratic Shock × Unemployment Security		0.015 (1.37)	0.016 (1.39)	0.014 (1.35)	0.015 (1.56)
Idiosyncratic Shock × Family Firms × Unemployment Security		0.1361*** (2.84)	0.1159** (2.50)	0.092* (1.90)	0.1048** (2.37)
Family Firms × Unemployment Security		0.008 (1.31)	0.008 (1.32)	0.07 (1.27)	0.007 (1.06)
Idiosyncratic Shock × Financial Development			0.001 (0.82)		
Idiosyncratic Shock × Family Firms × Financial Development			0.001 (0.79)		
Unemployment Security	0.022 (1.60)	0.016 (1.38)	0.013 (1.37)	-	-0.012 (-1.15)
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Time	Firm
Year Fixed Effects	Yes	Yes	Yes	No	Yes
R^2	0.15	0.16	0.18	0.21	0.22
Number of Observations	30,436	30,436	30,436	30,436	30,436

Table continues on next page

Table continues from previous page

Panel B: Positive Shocks

Idiosyncratic Shock	0.179** (2.25)	0.165** (2.10)	0.152** (1.99)	0.144* (1.89)	0.186** (2.32)
Family Firms	0.002 (0.68)	0.002 (0.67)	0.002 (0.51)	0.002 (0.50)	
Idiosyncratic Shock × Family Firms	-0.075* (-1.87)	-0.061 (-1.59)	-0.059 (-1.40)	-0.032 (-1.29)	-0.049 (-1.39)
Idiosyncratic Shock × Unemployment Security		0.010 (0.80)	0.010 (0.78)	-0.007 (-0.29)	0.010 (1.06)
Idiosyncratic Shock × Family Firms × Unemployment Security		0.080* (1.87)	0.051 (1.50)	0.022 (1.37)	0.025 (1.29)
Family Firms × Unemployment Security		0.005 (0.84)	0.005 (0.86)	-0.004 (-0.27)	0.004 (0.71)
Idiosyncratic Shock × Financial Development			-0.0002 (-0.6)		
Idiosyncratic Shock × Family Firms × Financial Development			-0.0001 (-0.41)		
Unemployment Security	0.014 (1.15)	0.011 (0.92)	0.008 (0.91)	-	-0.008 (-0.75)
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Time	Firm
Year Fixed Effects	Yes	Yes	Yes	No	Yes
R^2	0.10	0.11	0.11	0.15	0.18
Number of Observations	85,391	85,391	85,391	85,391	85,391

Table 7. Employment Insurance in Family and Non-Family Firms in Response to Transitory and Persistent Shocks in Industry Sales

This table presents the estimates of the sensitivity of employment to persistent and temporary shocks in sales for 7,710 firms from 41 countries over the period from 1988 to 2012. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. The coefficient estimates are obtained via two separate IV regressions, which identify the sensitivity to transitory shocks (Panel A) and to persistent ones (Panel B) respectively (see the appendix for details). The independent variables are as follows: Transitory Shock is the transitory component of the change in sales of firm *i*; Persistent Shock is the persistent component of the change in sales of firm *i*; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	(2)	(3)
Panel A: Transitory Shocks			
Transitory Shock	0.233*** (4.01)	0.209*** (3.72)	0.186*** (3.11)
Transitory Shock × Family Firms	-0.250*** (-3.92)	-0.215*** (-3.10)	-0.205*** (-2.96)
Transitory Shock × Unemployment Security			0.040 (1.01)
Transitory Shock × Family Firms × Unemployment Security			0.122** (2.50)
Unemployment Security	0.038** (2.04)	0.026* (1.85)	0.018* (1.70)
Firm-level Control Variables	No	Yes	Yes
Fixed Effects	Country-Industry-Year	Country-Industry-Year	Country-Industry-Year
F-test (p value)	<0.001	<0.001	<0.001
Panel B: Persistent Shocks			
Persistent Shock	0.315*** (3.76)	0.286*** (3.32)	0.267*** (3.07)
Persistent Shock × Family Firms	-0.130* (-1.90)	-0.120* (-1.71)	-0.098 (-1.57)
Persistent Shock × Unemployment Security			0.032 (1.27)
Persistent Shock × Family Firms × Unemployment Security			0.026 (1.03)
Unemployment Security	0.035* (1.91)	0.028* (1.72)	0.018 (1.49)
Firm-level Control Variables	No	Yes	Yes
Fixed Effects	Country-Industry-Year	Country-Industry-Year	Country-Industry-Year
F-test (p value)	<0.001	<0.001	<0.001
Number of Observations	105,725	105,725	105,725

Table 8. Employment Insurance in Family and non-Family Firms with High and Low Financial Distress Risk in Response to Shocks

The table presents estimates of a pooled regression for family and non-family firms with low financial distress risk (those in the top quintile of firms ranked by the Altman's z-score) in columns 1, 3, and 5, and for firms with high financial distress risk (those in the bottom quintile of firms ranked by the Altman's z-score) in columns 2, 4 and 6. The dependent variable is the yearly change in the logarithm of total employment of firm *i* in year *t*. The shocks used are as follows: in columns 1 and 2 we use the yearly change of log sales of each industry *j* in year *t* excluding the sales of firm *i* from the calculation; in columns 3 and 4 we use idiosyncratic shocks defined as the residuals from a first-stage GMM regression estimated with the Arellano-Bond method that explains the first difference of the log of sales of firm *i* in year *t*; and in columns 5 and 6 we use negative industry-level shocks defined as the years when industry-level annual sales growth is negative. The other independent variables are as follows: Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder which is present in the firm's management, and 0 otherwise; Unemployment Security is the gross replacement rate (GRR) in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). Standard errors in specifications shown in columns 1, 2, 5 and 6 are clustered at the firm level. Bootstrapped standard errors are used in the specifications shown in columns 3 and 4. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	(2)	(3)	(4)	(5)	(6)
Shock	0.1680***	0.1981***	0.2210***	0.3128***	0.2441***	0.2622***
	(2.70)	(3.81)	(3.77)	(4.94)	(2.70)	(3.02)
Family Firms	0.0031	0.0045	-0.0018	0.0002	0.0029	0.0025
	(0.91)	(1.07)	(-0.35)	(0.21)	(1.11)	(0.97)
Shock × Family Firms	-0.1682***	-0.0391	-0.2619***	-0.0449	-0.2109***	-0.0492
	(-3.75)	(-1.50)	(-4.10)	(-0.76)	(-3.12)	(-1.51)
Shock × Unemployment Security	0.0216	0.0309*	0.0329*	0.0524*	-0.0070	-0.0028
	(1.37)	(1.75)	(1.85)	(1.90)	(-0.72)	(-0.49)
Shock × Family Firms × Unemployment Security	0.0922***	0.0540*	0.1200***	-0.0224	0.0809*	-0.0172
	(2.90)	(1.68)	(3.44)	(-1.15)	(1.87)	(-1.01)
Family Firms × Unemployment Security	0.0059	0.0041	0.0067	0.0065	0.0080	0.0089
	(1.07)	(0.78)	(0.69)	(0.87)	(1.38)	(1.51)
Unemployment Security	0.0130	0.0092	0.0211	0.0191	0.0087	-0.0029
	(1.26)	(1.03)	(1.19)	(1.21)	(0.73)	(-0.46)
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Country-Industry
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R^2	0.18	0.10	0.25	0.07	0.08	0.05
Number of Observations	27,410	24,256	25,727	22,912	7,211	6,820

Table 9. Wage Insurance in Family and Non-Family Firms in Response to Shocks in Industry Sales

This table presents the estimates of a pooled regression model for 3,290 firms from 41 countries over the period from 1988 to 2012. The dependent variable is the yearly change in the logarithm of the real average wage of firm *i* in year *t*. The independent variables are as follows: Δ Industry Sales is the yearly change of log sales of each industry *j* in year *t* excluding the log sales of firm *i* from the calculation; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). In column 4 we also include the variables Financial Development, and Family Firms × Financial Development (not reported). Standard errors are clustered at the firm level. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Δ Industry Sales	0.062***	0.054***	0.052***	0.042***	0.057***
	(3.29)	(2.89)	(2.87)	(2.65)	(2.95)
Family Firms	-0.019*	-0.010	-0.006	-0.003	
	(-1.90)	(-1.58)	(-1.39)	(-1.08)	
Δ Industry Sales × Family Firms		0.042***	0.033**	0.023*	0.027**
		(2.75)	(2.24)	(1.85)	(2.51)
Δ Industry Sales × Unemployment Security			-0.020*	-0.017	-0.022
			(-1.84)	(1.56)	(-1.45)
Δ Industry Sales × Family Firms × Unemployment Security			0.0291*	0.0220	0.0115
			(1.80)	(1.54)	(1.22)
Family Firms × Unemployment Security			-0.0072	-0.0059	-0.0061
			(-0.91)	(-0.56)	(-0.62)
Δ Industry Sales × Financial Development				-0.0002	
				(-0.97)	
Δ Industry Sales × Family Firms × Financial Development				0.0002	
				(0.88)	
Unemployment Security	0.0121	0.0114	0.0102	0.0076	0.0098
	(1.09)	(1.02)	(0.92)	(0.81)	(1.01)
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Firm
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.08	0.09	0.09	0.11	0.12
Number of Observations	40,280	40,280	40,280	40,280	40,280

Table 10. Wage Insurance in Family and Non-Family Firms in Response to Idiosyncratic Shocks in Firm Sales

This table presents the estimates of a pooled regression model for 3,290 firms from 41 countries over the period from 1988 to 2012. The dependent variable is the yearly change in the logarithm of the real average wage of firm *i* in year *t*. Idiosyncratic Shock is the residual from a first-stage GMM regression estimated with the Arellano-Bond method that explains the first difference of the log of sales of firm *i* in year *t*; Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Labor Market Tightness is the reciprocal of the ratio of long term unemployment (which persists for one year or longer) over total unemployment (only for OECD countries); Financial Development is the ratio of stock market capitalization to GDP; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). The specification in column 5 also includes the variables Financial Development, and Family Firms × Financial Development (not reported). Bootstrapped standard errors are used in each specification. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	(2)	(3)	(4)	(5)
Idiosyncratic Shock	0.076***	0.067***	0.063***	0.052***	0.068***
	(4.05)	(3.64)	(3.52)	(3.26)	(3.61)
Family Firms	-0.023*	-0.013*	-0.007	-0.004	
	(-1.91)	(-1.72)	(-1.57)	(-1.34)	
Idiosyncratic Shock × Family		0.051***	0.042***	0.029**	0.032**
Firms		(3.31)	(2.65)	(2.27)	(2.47)
Idiosyncratic Shock ×			-0.025**	-0.021*	-0.027*
Unemployment Security			(-2.26)	(-1.92)	(-1.78)
Idiosyncratic Shock × Family			0.038**	0.029**	0.025**
Firms × Unemployment Security			(2.34)	(2.00)	(2.11)
Family Firms × Unemployment			-0.009	-0.008	-0.008
Security			(-1.18)	(-1.09)	(-1.01)
Idiosyncratic Shock × Financial				-0.001	
Development				(-0.96)	
Idiosyncratic Shock × Family				-0.001	
Firms × Financial Development				(-0.91)	
Unemployment Security	0.016	0.015	0.013	0.010	0.013
	(1.42)	(1.34)	(1.20)	(1.05)	(1.23)
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Country-Industry	Firm
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R^2	0.12	0.13	0.14	0.16	0.20
Number of Observations	40,280	40,280	40,280	40,280	40,280

Table 11. Wage Insurance in Family and Non-Family Firms in Response to Shocks in a Matched Sample

This table presents the estimates of a pooled regression model for 3,290 firms from 41 countries over the period from 1988 to 2012 for family firms and their non-family matches from 41 countries over the period 1988-2012. We match each family firm with a non-family firm with the closest stock market capitalization and cash flow volatility from the same country and industry. The dependent variable is the yearly change in the logarithm of the real average wage of firm *i* in year *t*. The shocks used are as follows: in columns 1-3 we use the yearly change of the logarithm of sales of each industry *j* in year *t* excluding the log sales of firm *i* from the calculation; in columns 4-6 we use the idiosyncratic shock to sales, defined as the residual from a first-stage GMM regression estimated with the Arellano-Bond method that explains the first difference of the log of sales of firm *i* in year *t*. The other independent variables are as follows: Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management, and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Labor Market Tightness is the reciprocal of the ratio of long term unemployment (which persists for one year or longer) over total unemployment (only for OECD countries); Financial Development is the ratio of stock market capitalization to GDP; Firm-level Control Variables are the following: Firm Size is the log of market capitalization of each firm *i* in year *t*-1; Return on Assets is the return on total assets of each firm *i* in year *t*-1; Asset Tangibility (the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t*-1); and Leverage (the ratio of total debt to total assets of each firm *i* in year *t*-1). Standard errors in specifications shown in columns 1-3 are clustered at the firm level. Bootstrapped standard errors are used in the specifications shown in columns 4-6. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	Industry Shocks			**Idiosyncratic Shocks**		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Idiosyncratic Shock	0.061***	0.054***	0.062***	0.086***	0.078***	0.075***
	(3.34)	(3.19)	(3.31)	(3.93)	(3.81)	(3.50)
Family Firms	-0.012	-0.006	-	-0.014	-0.007	
	(-1.56)	(1.40)		(-1.07)	(-0.92)	
Idiosyncratic Shock × Family Firms	0.042***	0.032**	0.028**	0.055***	0.043***	0.032**
	(2.91)	(2.43)	(2.49)	(3.62)	(2.84)	(2.39)
Idiosyncratic Shock ×		-0.023*	-0.024		-0.027**	-0.029*
Unemployment Security		(-1.87)	(-1.62)		(-2.34)	(-1.91)
Idiosyncratic Shock × Family Firms		0.035**	0.024*		0.041**	0.031*
× Unemployment Security		(2.14)	(1.73)		(2.05)	(1.89)
Family Firms × Unemployment		-0.009	-0.007		-0.010	-0.009
Security		(-1.08)	(-1.02)		(-1.27)	(-1.22)
Unemployment Security	0.014	0.012	0.012	0.016	0.014	0.014
	(1.21)	(1.19)	(1.18)	(1.27)	(1.22)	(1.21)
Firm-level Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Country-Industry	Country-Industry	Firm	Country-Industry	Country-Industry	Firm
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	
R^2	0.15	0.18	0.22	0.21	0.24	0.29
Number of Observations	40,280	40,280	40,280	40,280	40,280	40,280

Table 12. Price of Employment Insurance in Family Firms

This table presents the estimates of a pooled regression model for 3,290 firms from 41 countries over the period from 1988 to 2012. The dependent variable is the log of the real average wage of firm *i* in year *t*. The independent variables are as follows: Family Firm is a dummy that takes the value of 1 if the firm *i*'s ultimate blockholder is a family blockholder who is present in the firm's management and 0 otherwise; Unemployment Security is the gross replacement rate in each country, calculated as the ratio of the unemployment insurance benefits received by a worker in the first two years of unemployment to the worker's last gross earnings; Financial Development is the ratio of stock market capitalization to GDP; Firm Size is the log of market capitalization of each firm *i* in year *t-1*; Asset Tangibility is the ratio of Plant, Property and Equipment to Total Assets of each firm *i* in year *t-1*; Return on Assets is the return on total assets of each firm *i* in year *t-1*; Leverage is the ratio of total debt to total assets of each firm *i* in year *t-1*. Standard errors are clustered at the firm level. T-statistics are reported in parenthesis. Asterisks (*, ** and ***) indicate statistical significance (at the 10%, 5% and 1% level, respectively).

	(1)	(2)	(3)	(4)
Family Firms	-0.0942*** (-3.25)	-0.0681** (-2.54)	-0.0551** (-2.30)	-
Unemployment Security × Family Firms	0.0054** (2.53)	0.0048** (2.29)	0.0047** (2.30)	0.0058** (2.49)
Financial Development × Family Firms			0.0031 (0.87)	
Unemployment Security	0.0087 (0.90)	0.0081 (0.95)	0.0074 (0.82)	0.0109 (1.24)
Firm Size		0.0499*** (2.77)	0.0415** (2.37)	0.0370** (2.49)
Asset Tangibility		0.0095* (1.89)	0.0096* (1.90)	0.0071 (1.52)
Return on Assets		0.0801*** (3.20)	0.0776*** (3.19)	0.0604*** (2.68)
Leverage		-0.0422 (1.04)	-0.0392 (1.05)	-0.0307 (0.91)
Fixed Effects	Country-Industry	Country-Industry	Country-Industry	Firm
Year Fixed Effects	Yes	Yes	Yes	Yes
R^2	0.09	0.11	0.12	0.16
Number of Observations	40,280	40,280	40,280	40,280