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**Article**

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# Firm-Level Risks, Lifetime Earnings Uncertainty, and Household Savings

Luigi Pistaferri

In the workhorse competitive labor market model used by economists, knowing whom we work for is irrelevant for understanding the sources of wage risk and wage inequality. Workers carry the risk of shocks to their productivity wherever they work, and they bear it fully.

But imperfections in the labor, credit, and insurance markets weaken this extreme view. Job search costs on the two sides of the labor market, as well as the presence of non-monetary components that workers or firms value, such as job amenities or employee loyalty, imply rents from the employment relationship. Wages deviate from marginal productivity and become dependent on firm characteristics, such as profits, value added, or other measures of performance. Alternatively, asymmetries in access to credit or insurance may lead to the establishment of long-term employment relationships in which firms partially insure workers' wages against productivity risks, with the transmission of firm shocks onto wages becoming a function of differences in risk tolerance

as well as limits on the feasible set of contracts, such as workers' inability to make some types of commitments.

A growing literature in labor economics has thus tried to quantify the role of the firm in explaining the structure and evolution of wages, the types of risks that individuals face over the life cycle, how individuals respond to these risks, and important welfare and policy questions. This summary describes some of my recent work on these issues.

## Measuring Shocks and Pass-Through

Measuring the linkages between wages and firm performance is challenging due to various confounding factors, such as aggregate, geographic, or industry shocks that alter workers' outside options rather than the rents from the employment relationship. Recent work has tackled these challenges using administrative employer-employee data with detailed information on both wages and firm performance. A strand of the empirical lit-

erature started by John Abowd, Francis Kramarz, and David Margolis documents systematic firm effects on wages and a positive correlation between firm and worker fixed effects consistent with production complementarities arising from assortative matching of highly productive workers and highly productive firms.<sup>1</sup>

A related literature studies the pass-through of firm-related shocks onto wages. An early example of the pass-through literature using employer-employee data is my paper with Luigi Guiso and Fabiano Schivardi, which analyzes worker social security and firm balance sheet records from Italy.<sup>2</sup> One challenge, common to the entire literature, is how to measure firm shocks. We use unexplained variation in value added, which we argue is a sensible metric of firm performance as it measures the volume of contractible output that remains once intermediate inputs have been remunerated. An important novelty of our work is the distinction between permanent and transitory firm shocks, which in principle may help separate rent sharing from partial insur-



Luigi Pistaferri is a professor of economics at Stanford University and the Ralph Landau Senior Fellow at the Stanford Institute for Economic and Policy Research. Pistaferri has studied various topics in labor, macro, and public economics, encompassing the measurement of labor market risks (including firm-level risks) and the implications for household consumption and savings, the importance of return heterogeneity for wealth inequality, the welfare implications of screening errors in disability insurance programs, and the link between partial insurance and consumption inequality. He is a research associate in the NBER's Economic Fluctuations and Growth and Labor Studies programs.

Pistaferri has served as coeditor of the *American Economic Review* and is a member of the Panel Study of Income Dynamics Board of Overseers and a Fellow of the Econometric Society. In 2018–19 he was the Modigliani Visiting Professor at the University of Naples and in 2011–12 he held the Bajola Parisani Visiting Chair in Economics and Institutions at the Einaudi Institute for Economics and Finance in Rome.

Pistaferri's research has been funded by the National Science Foundation, the National Institutes of Health, the European Research Council, the Research Council of Norway, and the Washington Center for Equitable Growth. He is the author with Tullio Jappelli of the book *The Economics of Consumption*.

Pistaferri did his undergraduate studies in Italy (IUN Naples and Bocconi Milan), received a PhD in economics from University College London, and joined the Stanford faculty in 1999.

ance interpretations of the pass-through coefficient. A key finding is that wages appear insulated from transitory shocks but respond, albeit partially, to permanent changes in the firm's fortunes. One explanation is that diversified access to insurance or credit markets allows firms to absorb transitory shocks, but bankruptcy constraints prevent full insurance of permanent shocks, requiring wages to adjust. We also find that the estimated pass-through effect is larger for workers with greater responsibilities in the firm, such as high-level executives, and for firms with lower performance variance. Remarkably, these qualitative findings have been replicated for several other countries, including the United States.<sup>3</sup> Recent studies have departed from a pure statistical methodology of measuring firm shocks and searched instead for quasi experiments in which the firm faces exogenous shifts in its fortunes, such as a product market or technology shock. For instance, Patrick Kline, Neviana Petkova, Heidi Williams, and Owen Zidar measure firm shocks with the allowance of patent applications by US firms.<sup>4</sup>

### Implications for Lifetime Risk

Two implications of the foregoing evidence are that firm risk may represent a significant component of the lifetime uncertainty faced by workers, and that firm-induced wage risk can help us understand how consumers respond to uncertainty shocks. A positive pass-through means that workers partake of the bad as well as the good fortunes of the firm. Under standard assumptions about preferences, workers are more willing to pay to avoid bad states of nature than to increase the chance of good ones. Guiso, Schivardi, and I calculated that firm-related shocks could explain about half of the workers' permanent unexplained wage risk, which is more welfare-relevant than transitory wage risk. A limitation of this calculation is that it is based on a sample of job stayers, which may understate the role of firm shocks, since part of the adjustment may come from job-to-job switches or movements across employment states. Wage risk and employment risk indeed go hand in hand, as emphasized in the literature on the persistent wage scarring effects of job displacement.

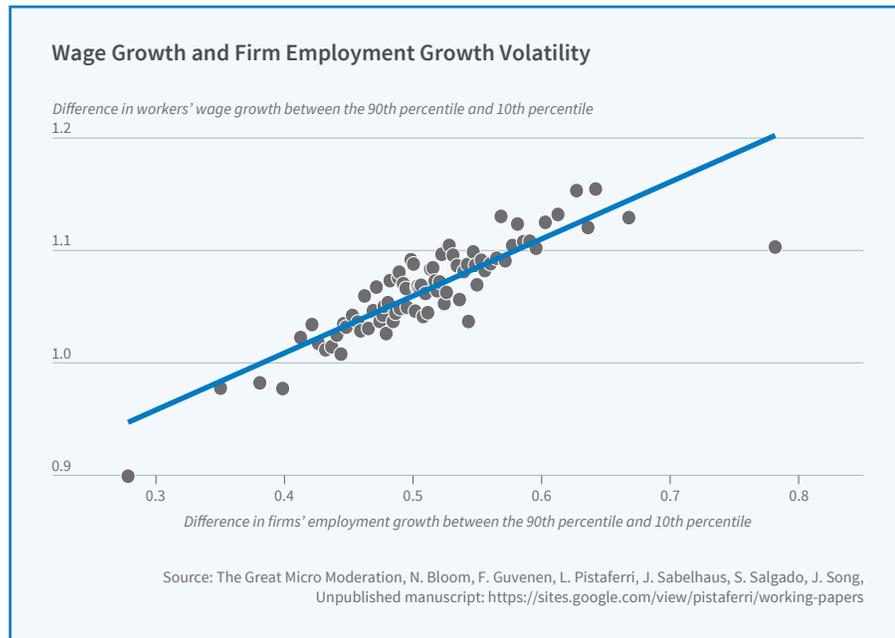
Benjamin Friedrich, Lisa Laun, Costas Meghir, and I use administrative data from Sweden to account for the effect of firm-specific shocks on both wages and labor market transitions.<sup>5</sup> We calculate that by age 55 about 40 percent of the cross-sectional variance in wages of high-skill workers is attributable to firm-level shocks. For unskilled workers this is only about 6 percent, a finding potentially consistent with union protection — an important institutional feature of the Swedish labor market — being more important for them.

To better understand the implications of our findings, we simulate our model of counterfactual scenarios in which we change the nature of wage variability over the life cycle of a worker. In one scenario, we eliminate any pass-through of firm shocks onto wages but keep match effects such as those attributable to production complementarities across workers. In another scenario, we shut down all

firm effects. We find that the variance of wages over the life cycle declines substantially when eliminating firm shocks, but less so when only match productivity shocks are eliminated.

Given that the impact of firm shocks on earnings can be attenuated through job mobility, in another counterfactual experiment we eliminate job-to-job moves or quits into unemployment. If workers cannot move or quit, shocks stay with them longer and cannot be avoided, resulting in higher variances over the life cycle. This is mostly due to pass-through of firm-specific shocks. Hence, workers' mobility represents an implicit form of insurance against the transmission of firm-specific risk. This insurance is imperfect, however, since mobility is significantly limited by job market frictions.

A decrease in the frequency of job-to-job moves has been shown to indicate declining labor market fluidity and firm-level employment volatility.<sup>6</sup> Nicholas Bloom, Fatih Guvenen, John Sabelhaus, Sergio Salgado, Jae Song and I use administrative US Social



**Figure 1**

Security data to document that the “Great Moderation” — the period of reduced economic volatility between the mid-1980s and the onset of the Great Recession observed at the firm and macro levels — extends to workers' wages as well, contradicting earlier evidence from survey data.<sup>7</sup> We show that declining wage volatility can be reconciled with the well-known finding of increasing wage inequality because of a strong simultaneous decline in mobility across the wage distribution. We also find that the two “micro” forms of moderation appear related, consistent with a pass-through of firm-related shocks onto wages. Figure 1 shows the relationship between wage growth volatility and firm employment growth volatility, measured by the 90–10 percentile difference, in data aggregated at the industry/year level. These findings are confirmed when looking at firm-level variation, which allows us to control more convincingly for sorting of high-risk workers into high-risk firms, and hence to better assess the causality of the relationship.

## Implications for Saving Behavior

Andreas Fagereng, Guiso, and I go beyond the question of how much firm shocks matter for wages and analyze the implications of these shocks for household finance. In particular, we study how firm-induced wage risk, which is outside the control of the worker, affects wealth accumulation and financial portfolio composition. In a first study, we use Norwegian administrative data to test whether consumers respond to the increased wage risk that is induced by a decline in the firm's fortunes by accumulating precautionary savings.<sup>8</sup> Our estimates are consistent with the presence of a moderate degree of prudence, even in a setting, like Norway, where the government provides substantial social insurance. This is because wage risk, unlike unemployment risk, remains largely uninsured. In a second study, we test whether households tilt their portfolio away from risky assets when facing greater human capital risk because they work for a particular employer.<sup>9</sup> We document that the effects of background risk are heterogeneous across the wealth distribution. This heterogeneity comes from two sources: a pass-through channel, whereby the effect of firm shocks is larger for wealthier workers, either because they have a greater ability to self-insure and hence demand less insurance from the firm, or because they have greater bargaining power when splitting rents from the employment relationship; and a background risk channel whereby wealthier workers are less sensitive at the margin to an increase in background risk. We conclude that background risk is an important determinant of portfolio allocations, and that it discourages stockholding significantly only for those at the bottom of the wealth distribution. For those at the top it has negligible effects. This has an important implication for asset prices: because most stocks are held by the wealthy, background risk has little effect on aggregate demand for stocks, and thus on stock returns.

## Future Directions

There is convincing and relatively uncontroversial evidence that idiosyncratic firm shocks transmit onto wages. The evidence is consistent with several theoretical explanations, and more research on which one best fits the data would certainly be useful. More research could also be directed at studying how firm-related risk affects other important household finance decisions, such as why households hold very heterogeneous risky portfolios, contrary to the predictions of standard models such as the Capital Asset Pricing Model. One prominent explanation is hedging of human capital risk, which significantly depends on firm-induced risk. The long-term nature of the employer-employee relationship also implies repeated interactions among workers employed at the same firm. Giacomo De Giorgi, Anders Frederiksen, and I studied consumption network effects using firm shocks as a source of exogenous varia-

tion in peers' consumption.<sup>10</sup> In principle, the firm may also facilitate coworkers' insurance exchanges with respect to specific wage and consumption shocks, although the empirical relevance of this activity is yet to be established.

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<sup>1</sup> "High Wage Workers and High Wage Firms," Abowd JM, Kramarz F, Margolis DN. NBER Working Paper 4917, November 1994, and *Econometrica* 67(2), March 1999, pp. 251–333.

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<sup>2</sup> "Insurance within the Firm," Guiso L, Pistaferri L, Schivardi F. *Journal of Political Economy* 113(5), October 2005, pp. 1054–1087.

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<sup>3</sup> One example of such a study is "Imperfect Competition, Compensating Differentials and Rent Sharing in the US Labor Market," Lamadon T, Mogstad M, Setzler B. NBER Working Paper 25954, June 2019.

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<sup>4</sup> "Who Profits from Patents? Rent-Sharing at Innovative Firms," Kline P, Petkova N, Williams H, Zidar O. NBER Working Paper 25245, revised March 2019, and *Quarterly Journal of Economics* 134(3), August 2019, pp. 1343–1404.

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<sup>5</sup> "Earnings Dynamics and Firm-Level Shocks," Friedrich B, Laun L, Meghir C, Pistaferri L. NBER Working Paper 25786, April 2019.

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<sup>6</sup> "Labor Market Fluidity and Economic Performance," Davis S, Haltiwanger J. NBER Working Paper 20479, September 2014, revised December 2014.

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<sup>7</sup> "The Great Micro Moderation," Bloom N, Guvenen F, Pistaferri L, Sabelhaus J, Salgado S, Song J. Unpublished manuscript, [sites.google.com/view/pistaferri/working-papers](https://sites.google.com/view/pistaferri/working-papers).

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<sup>8</sup> "Firm-Related Risk and Precautionary Saving Response," Fagereng A, Guiso L, Pistaferri L. NBER Working Paper 23182, February 2017, and *American Economic Review* 107(5), May 2017, pp. 393–397.

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<sup>9</sup> "Portfolio Choices, Firm Shocks, and Uninsurable Wage Risk," Fagereng A, Guiso L, Pistaferri L. NBER Working Paper 22883, December 2016, and *Review of Economic Studies* 85(1), January 2018, pp. 437–474.

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<sup>10</sup> "Consumption Network Effects," De Giorgi G, Frederiksen A, Pistaferri L. NBER Working Paper 22357, June 2016, and *Review of Economic Studies* 87(1), January 2020, pp. 130–163.

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