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Internal Labor Markets, Wage Convergence, and Investment

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Abstract

I document wage convergence in conglomerates using detailed plant-level data: workers in low-wage industries collect higher-than-industry wages when the diversified firm also operates in high-wage industries. I confirm this effect by exploiting the implementation of NAFTA and changes in minimum wages at the state-level as sources of exogenous increases in wages in some plants. I then track the evolution of wages of the remaining workers of the firm, relative to workers of unaffiliated plants. Plants where workers collect higher-than-industry wages operate with higher capital intensity, suggesting that internal labor markets may affect investment decisions in internal capital markets.

I Introduction

Ever since Coase (1937)'s seminal paper on the nature of the firm, there has been widespread interest in what determines the boundaries of firms and how these boundaries shape the allocation of resources. Much of the finance literature has focused on the effect of firms' boundaries on firm value and the allocation of capital.[1] Less attention has been paid to their effect on labor costs.[2] If firms' boundaries alter the compensation workers receive, what has previously been seen as "misallocation" of investments can be an optimal response to these altered wages.

In this paper, I examine whether firms' boundaries affect wages. I document that a worker's wages are positively related to the wages of workers in other divisions of the firm. This co-dependence of wages within the boundaries of the firm exhibits an asymmetric pattern. Workers in low-wage industries collect higher-than-industry wages when the firm is also present in high-wage industries. On the other hand, the wages at the top of the compensation distribution do not seem to be negatively affected by the firm's presence in low-wage industries. These positive within-firm spillovers in compensation are what I call *wage convergence*. Moreover, I document that divisions exposed to increased labor costs due to wage convergence operate with higher capital-labor ratios. This suggests that internal labor markets may affect investments in internal capital markets and, in some cases, lead to automation in production.[3]

[1] There is a vast empirical literature that examines the nature of investments in conglomerates. For recent surveys, see Stein (2003) and Maksimovic and Phillips (2007).

[2] For more discussion, see Zingales (2000). There is a growing empirical literature on labor, capital structure, and financial constraints (e.g., Matsa (2010), Chen et al. (2011a), Benmelech et al. (2011), Simintzi et al. (2014), Baghai et al. (2017), Baghai et al. (2018)).

[3] A recent *Wall Street Journal* article entitled "Minimum Wage Backfire" discusses similar responses by firms to minimum wage increases. The article argues that "forcing businesses to pay people out of proportion to the profits they generate will provide those businesses with a greater incentive to replace employees with machines."

There are several ways through which firm boundaries, and in particular conglomerate organizational form, can affect compensation in internal labor markets. First, organizational form may affect productivity (e.g., Grossman and Hart (1986), Hart and Moore (1990)). If workers compensation reflects their productivity, then any impact of diversification on productivity would also manifest itself in wages. Moreover, because of the operational hedging obtained by firms that are present in multiple industries, labor contracts in these firms may be safer, leading to more firm insurance in the form of lower unemployment risk and lower wage volatility. If workers value this type of insurance, they may accept lower wages at a conglomerate than at a stand-alone firm.

Social interactions are another mechanism through which firm boundaries could impact wages. One common feature of the theories that rely on this mechanism is that wages of other workers enter directly as an argument in the utility function. Using this framework, Frank (1984) and, more recently, DeMarzo and Kaniel (2017), argue that highly paid workers derive "status" utility from being in the presence of low-paid workers. Conversely, low paid workers get a disutility from interacting with their high-wage colleagues.[4] This idea also gives rise to that of "fairness" of wages, presented in Akerlof and Yellen (1990).[5] Workers evaluate their wages relative to a benchmark and thereby assess their fairness. Workers who perceive their wage as unfair may take actions of revenge or sabotage against the firm. Consequently, it may be optimal for the firm to pay its workers an efficiency wage that they would perceive as fair, even if it differs from the marginal product of labor.[6]

[4]This leads Frank (1985) to note the importance of "Choosing the right pond." In pop culture, this idea is present in the famous cartoons "Keeping up with the Joneses" (Momand (1920)) and in the recent Hollywood movie *The Joneses*.

[5]Akerlof (1982) and Akerlof (1984) also mention fairness and the importance of social norms in determining wages. More recently, Hart and Moore (2008) construct a model in which contracts act as a way to establish reference points that determine the notion of fairness.

[6]Even though it is impossible to know how workers form reference points in this setting, it is likely that

Even if fairness considerations across divisions of conglomerates are not relevant, firm-wide contracting may result in wage spillovers across divisions. The reason is that when the wages of other workers do not enter directly in the utility function, they may still provide information about the prospects of the firm and the way it treats its workers. Therefore, the actions of the firm toward a group of employees can undermine its reputation with everyone else (Levin (2002)). Some firms may be reluctant to lay off workers or reduce wages for a subgroup of employees in a downturn, as this could undermine the perception of job security or the wage expectations for the remaining workers.[7]

Intra-firm agency problems and rent seeking are other channels that could lead to distortions in internal labor markets. If a company is flush with cash due to good performance in one division, other workers in the firm may attempt to engage in lobbying activities in order to obtain a share of that cash (e.g., Milgrom and Roberts (1988)). In particular, workers who are less productive—and, as such, have less to lose by diverting their time away from productive activities—would have an incentive to rent seek the resources of the firm. In the literature on internal capital markets, it has been argued that such rent-seeking behavior could lead to "compression" in the within-firm allocation of capital (e.g., Stein (1997), Scharfstein and Stein (2000), and Rajan et al. (2000)). I argue that a similar logic may be applied to the wage setting process in internal labor markets.

Finally, legal constraints may prevent the firm from treating different groups of employees differently. For example, it may be difficult to provide health insurance to one

fairness will play a larger role among workers who perform similar tasks, such as co-workers within the same division. However, it is also conceivable that the way the firm treats workers in other divisions may lead to feelings of fairness, even if those workers are dissimilar in terms of skills or occupations.

[7]Consistent with this notion, in his book *Why wages don't fall during a recession*, Bewley (1999) provides numerous quotes from executives describing the importance of internal equity in the compensation structure of firms.

group of workers but not others within the same firm, as that may lead to legal risks in the form of discrimination lawsuits.[8]

The importance of wage equity within firms is not just a theoretical possibility and is discussed in several news reports. For instance, a recent *Wall Street Journal* article reports that auto workers are attempting to convert a wage structure with two levels to a single level for every member of the firm, arguing that doing so would increase fairness.[9] Similarly, the manager of Tennaco, which acquired Houston Oil and Minerals Corporation in the late 1980s, also expressed his desire for wage harmonization within his firm when he argued that "we have to ensure internal equity and apply the same standard of compensation to everyone" (see Milgrom and Roberts (1990) for more details). The importance of this pressure for internal equity is also clearly stated in a recent survey where 70% of participants identified more generous employee benefits as a negative synergy associated with mergers (PricewaterhouseCoopers (2010)).

The primary aim of this paper is to empirically test whether there is systematic pressure for wage convergence inside conglomerates and, if so, whether wage patterns in internal labor markets can help to explain investment decisions in internal capital markets. Diversified firms provide a good laboratory to study the existence of peer effects on workers' wages. The reason is that a conglomerate's presence in different industries generates a natural dispersion in wages across workers in the firm, providing a setting where pressure for internal equity could be more pronounced. Additionally, the existence of comparable standalone firms provides a benchmark for what the wages ought to be if firm boundaries were not relevant.

[8] In addition to the mechanisms discussed here, there is research that suggests an evolutionary preference toward equality. In particular, Brosnan and De Waal (2003) conduct a series of experiments that show that monkeys display aversion to inequality.

[9] "Some UAW Workers Seek End to Two-Tier Wages," *Wall Street Journal* August 13, 2011.

There are, however, several challenges a researcher needs to overcome in order to empirically tackle these questions. First, such a project requires detailed data on compensation and investment across divisions. This type of data is not available in public datasets. Second, one requires information on a large set of characteristics that may correlate with diversification and that could also affect wages and investment. Finally, one needs to grapple with the fact that the boundaries of the firms observed in equilibrium are not random. As such, even after controlling for a large set of observable characteristics, one needs to deal with the possibility that the endogenous selection of different divisions that comprise a firm may itself determine the within-firm compensation and capital allocation decisions.

To overcome these challenges, the paper uses detailed, plant-level data from the U.S. Census Bureau. The granularity of the data permits an observation of compensation across all establishments of the firm, as well as investment in manufacturing plants.

The main finding of the paper is that there are positive spillovers in the compensation of workers across different divisions of conglomerates: workers in low-wage industries collect higher-than-industry wages when the firm is also present in high-wage industries. The elasticity of wages to the wages of workers in other divisions of the firm is 0.14, which implies a 1.4% premium if wages in other divisions of the firm increase by 10%, where the premium is relative to what would be expected if productivity were the sole determinant of wages.

I conduct several tests that together alleviate concerns that the relationship I establish is spurious. Specifically, I am able to account for plant-specific (time-invariant) unobservable characteristics by examining the dynamics of wages in plants whose firm organizational structure and wages in other divisions change over time. I find a positive relationship between own wage and the wages of workers in other divisions. The within-plant time-series estimates imply a 0.14% wage premium for every 10% increase in the wages of workers in other divisions.

To alleviate concerns that time-varying unobservables could be affecting the estimates, I exploit two quasi-experiments. The first involves the implementation of the NAFTA agreement that exogenously increases worker wages in exporting plants.[10] I compare the evolution of wages of non-exporting plants ("treatment plants") in diversified firms that also own exporting plants with those of unaffiliated non-exporting plants ("control plants") after the event. Strikingly, though there are no differences in the evolution of wages of treatment and control plants before the NAFTA event, there is a divergence in wages after the event. The second quasi-experiment uses changes in minimum wage at the state level as an exogenous shock to the wages of workers in that state. I then track the evolution of wages within the firm for workers in other states and find that state-level minimum wage law impacts workers in the different states the firm operates in.

Cross-sectional tests provide suggestive evidence that a key mechanism through which firm boundaries lead to wage convergence is rent extraction. I reach this conclusion by documenting that wage co-movement within a firm is stronger when unionization is higher and product market competition is weaker. On the other hand, close geographic proximity does not seem to lead to stronger co-dependence of wages within firms.

Having established that diversified firms exhibit wage convergence, I next examine how this behavior correlates with their investment. I find that plants where workers collect higher wages due to wage convergence operate with higher capital-labor ratios. One potential explanation for this result is that the presence of peer effects in the wage structure of

[10] I discuss several reasons why the wages in exporting plants might have gone up after NAFTA in Section V.B.

diversified firms creates a wedge between the price of labor in diversified and non-diversified firms. As an optimal response to this difference in input prices, diversified firms that are present in high-wage industries—and pay higher wages to their workers in the low-wage segments—tilt their input use in these plants away from the expensive labor toward the relatively cheaper capital. Importantly, the differences in input allocation are also associated with differences in investment between plants of diversified and stand-alone firms. Unlike the literature that rationalizes the investment behavior of conglomerates with bargaining frictions in internal capital markets (e.g., Rajan et al. (2000)) or differences in investment opportunities (e.g., Chevalier (2000)), I argue that an important source of the differences in investment policies of conglomerates relative to stand-alone firms may lie in the workings of their internal labor markets and the way employees are remunerated.

This paper connects several strands of literature in corporate finance and personnel economics. First, the paper relates to the literature on corporate diversification. This literature has focused almost exclusively on value creation (e.g., Lang and Stulz (1994), Berger and Ofek (1995), Servaes (1996), Schoar (2002), Villalonga (2004b), Seru (2014), and Custodio (2014)) and internal allocation of capital (e.g., Stein (1997), Shin and Stulz (1998), Chevalier (2000), Rajan et al. (2000), Gertner et al. (2002), Stein (2002), Ozbas and Scharfstein (2010) and Matvos et al. (2018)).

The literature has largely neglected the effect of firm boundaries and diversified organizational form on labor. Some exceptions include Tate and Yang (2015), who analyze the allocation of workers across different segments of conglomerates,[11] and Schoar (2002), who analyzes average compensation in conglomerates. In addition, Alok and Gopalan (2017),

[11] I discuss how my results differ from those in Tate and Yang (2015) in greater detail in section VI.D.

Duchin et al. (2017), and Gartenberg and Wulf (2017) study the compensation of division managers. The literature has so far also been silent on the interplay between worker compensation and investment policy. This paper adds to the literature by examining how internal labor markets in conglomerates shape the wage-setting process of blue collar workers and, in turn, how this may affect investment. Labor contracts for regular, non-managerial workers are likely to differ from those of managers, suggesting that patterns observed in managerial contracts (like those studied by Alok and Gopalan (2017), Duchin et al. (2017), and Gartenberg and Wulf (2017)) may not be generally applicable to workers in lower hierarchical levels. Furthermore, because regular rank-and-file employees take up most of the labor expenses of the firms in the sample, understanding how the wages of these workers are set is crucial to complete the picture of the way labor is remunerated in multi-division firms. The paper also differs from the literature by arguing that wage setting inside conglomerates may be critical to assessing previous results on investment behavior.

Second, this paper contributes to the literature on internal labor markets. For example, Baker and Holmstrom (1995) and Baker et al. (1994) demonstrate the existence of persistent cohort effects in wages, and Doeringer and Piore (1985) describe “ports of entry” into firms, indicating that once workers are inside a firm, the treatment they receive is substantially different from that of outsiders. Starting with Abowd et al. (1999), there is also a large literature documenting the importance of firm-level effects on wages (see Card et al. (2018) for a recent review of this literature). This paper suggests that internal labor markets allow workers to be partly shielded from external labor markets and that the wages of workers depend not only on the industry they work in, but also on the set of industries in which their firm operates.

II Data and Variables

II.A Data Sources

The main source of data used in this paper is the U.S. Census Bureau (henceforth Census).[12] For the years 1977 to 2000, I combine three datasets from the Census: the Longitudinal Business Database (LBD), the Census of Manufacturers (CMF), and the Annual Survey of Manufacturers (ASM).[13]

The LBD contains information on all private, non-farm establishments in the United States that have at least one paid employee. For each establishment, there are data on the number of employees, payroll, geographic location, industry, and firm. By virtue of the completeness of this dataset, which encompasses about 7 million establishments per year, it is possible to build accurate measures of geographic and industrial diversification, as well as firm and division size. Unfortunately, the LBD does not contain information on productivity or investment, which is crucial for the paper; thus, I supplement it with two other Census datasets that have a higher level of detail.

For the years that end in 2 and 7 (the census years), the Census conducts the Census of Manufacturers, which collects detailed information on virtually all establishments (also referred to as plants) in the manufacturing sector—SIC codes 2000 to 4000—representing about 350,000 establishments per year. In the remaining years, the Census does not conduct

[12] Several papers (e.g., Lichtenberg (1991), Davis and Duhaime (1992), and Harris (1998)) document a lack of accuracy in Compustat reporting, either because firms underreport the segments they are in, or because they use discretionary power in reporting changes to segments when no real change occurred. Due to these shortcomings, others have used Census data to study diversification in the past (e.g., Schoar (2002), Villalonga (2004a), and Maksimovic and Phillips (2002)).

[13] The empirical analysis stops in 2000 because the employment in the US manufacturing sector declined sharply after that year (see appendix figure H.I), a decline that may represent a fundamental shift in the manufacturing sector in the US. By focusing the analysis on the years 1977-2000, the paper studies a period of stability during which macroeconomic shocks do not appear to impose large fluctuations in manufacturing employment. In addition, 2000 is also the year when the Census changed its industry classification from SIC into NAICS.

a survey on all establishments in the manufacturing sector. Instead, they collect information only on plants that have 250 or more employees and a random sample of the smaller establishments, through the Annual Survey of Manufacturers, corresponding to roughly 50,000 establishments per year.[14] The main data items from the CMF and the ASM that are used in the paper are sales, value added, wages of production workers, number of workers, production worker hours, investment, and book value of assets.

The main sample used in the paper is constructed as follows. Start with all establishments in the LBD that have non-missing firm identifier and industry information. At this point, construct measures of corporate diversification, firm size, division size, and firm wage level. These variables and their importance to this study will be discussed in detail in later sections. Then, merge the yearly LBD files with the ASM and CMF using a unique plant identifier that is common to all three datasets. As is typical in literature that uses Census data, administrative records for which information is imputed are excluded (e.g., Foster et al. (2008)). Finally, establishments with zero or negative value added and those that are present in the LBD but are not in the ASM or CMF are also excluded. The final sample only includes plants in the manufacturing sector, for which information on productivity is available. The use of these three datasets combined takes advantage of the extensive plant-level information of the ASM and CMF together with the accurate firm-level characteristics computed using the LBD.

To test different explanations for the results, the main dataset is complemented with data on state-level labor unionization. This data is constructed using the Current Population Survey (CPS) conducted by the Bureau of Labor Statistics for the years 1983 to 2000; it

[14] Starting in 1999, the cutoff for inclusion with certainty in the ASM went from 250 to 500 employees.

contains the percentage of manufacturing workers that are members of a labor union.[15]

II.B Variable Description

The first part of the paper analyzes wages in diversified firms and, as such, wages are the main variable of interest and the dependent variable in the regressions. In particular, I study the wage per hour of production workers, which is constructed by dividing the total wages (including bonus and benefits) paid to production workers in a given plant and year by hours of production workers at that plant in that year. One advantage of focusing on production workers is that the data contains an accurate measure of quantity (number of production hours), while for non-production workers it is more difficult to distinguish full-time workers with low wages from part-time workers. To minimize the influence of outliers on the results, wages are winsorized at the 1st and 99th percentiles each year.

To construct a measure of the wages of workers in other divisions of diversified firms, I create the variable $Log(Firm\ Wage)_{dft}$. For a worker in firm f and division d at time t, this variable is defined as the logarithm of the average wage of all other workers in the remaining divisions of the firm: $Firm\ Wage_{dft}=\frac{\sum_{i,l\neq d} wage_{ilft} \times workers_{ilft}}{\sum_{i,l\neq d} workers_{ilft}}$, where the sums are over all establishments i firm f has across all divisions l outside of division d, at time t. It takes the value of zero for undiversified firms that operate only in one division. Note that this variable is constant across establishments within a division at any given point in time, which is why no plant subscript is required. Throughout the paper, a division is defined at the three-digit SIC level.[16]

[15] The labor unionization dataset is available online at http://unionstats.gsu.edu/ and a description of it can be found in Hirsch and Macpherson (2002). This data is also used in Chen et al. (2011b) to study of the impact of labor unionization on stock returns.

[16] Though I note that the results also hold if divisions are defined at other levels. Appendix C reports results with divisions defined at the two-digit SIC level.

A critical variable for the analysis is the extent of diversification of the firm. I construct two different measures of diversification. The first measure is $Divdummy_{ft}$, a dummy variable that takes the value of 1 if firm f is present in more than one three-digit SIC industry in year t. In order to have a richer measure of diversification, I also construct *1-HHI* $Employees_{ft}$ defined as one minus the Herfindahl-Hirschman Concentration Index of employees at the three-digit SIC division level. Formally: $HHI\ Employees_{ft}=\sum_{d\in\Omega_{ft}} s^2_{dft}$, where s_{dft} is the share of firm f employees operating in division d at time t, and Ω_{ft} is the set of all divisions firm f operates in at time t.[17]

Using the wages of workers in stand-alone firms in the LBD, I classify industries (defined at the three-digit SIC level) into wage quintiles every year. Quintile 1 contains the industries with the lowest wages, and quintile 5 contains industries with the highest wages. All industries—not only those in the manufacturing sector—are classified into one of the five wage quintiles. This classification is then used to construct measures of the presence of a firm in each quintile. For example, the variable $Present\ in\ q5_{ft}$ is a firm-year level variable that takes the value of 1 if firm f owns at least one establishment in an industry that is in wage quintile 5 in year t, and takes the value of 0 otherwise. Similarly, the variable $Present\ in\ q1_{ft}$ is a dummy variable that takes the value of 1 if the firm is present in wage quintile 1 in year t, and takes the value of 0 otherwise. Even if plant i is not in wage quintile 1, but the firm has some establishment j in an industry that is categorized as quintile 1, this variable takes the value of 1.

The wage regressions include plant-level labor productivity as an explanatory

[17] To conduct robustness checks, I construct one additional measure of corporate diversification, $log(number\ of\ divisions)_{ft}$, the logarithm of the number of three-digit SIC industries in which firm f is present in year t. The results obtained using this alternative measure of diversification are qualitatively and quantitatively similar to the ones reported in the paper and are shown in Appendix A.

variable. Labor productivity is measured as the natural logarithm of value added per hour of labor ($VA/hour$). This variable is constructed by taking the yearly value added for the plant and dividing it by the total number of production hours. Value added is equal to sales minus change in inventory, minus material inputs, minus energy. This is a crucial variable in the analysis, as it allows for direct control of differences in the underlying quality of workers across different plants in the economy, even within the same industry.

Another important explanatory variable in the analysis is size, since it is well established in the literature as a key determinant of wages (e.g., Brown and Medoff (1989) and Oi and Idson (1999)). All regressions control for size at the firm level, division level, and plant level. The size controls are the number of employees of the firm, division, and plant, respectively. Plant age in years is controlled for using the variable *Age*.

Finally, in the analysis that examines the relationship between internal labor markets and internal capital markets, the dependent variables are capital-labor ratio and investment. The capital-labor ratio (*K/L ratio*) is constructed by dividing book value of assets by total number of employees at the plant in a given year. Investment (*CAPX/Sales*) is constructed by dividing capital expenditures by sales for each plant-year.

Table I contains the summary statistics for the variables of interest.[18]

III Empirical Strategy

The goal of this paper is to establish the existence and study the importance of peer effects on the wages of workers within firms. In particular, if the attribute that drives peer effects in the wages of plant i is *peer*, I evaluate the magnitude and statistical significance of β by

[18] In order to facilitate and expedite the disclosure process with the Census, only the rounded number of observations is reported.

estimating a regression of the form below:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot peer_{idft} + X'_{idft}\gamma + \epsilon_{idft}$$

There are several challenges in interpreting β as the causal impact of peer effects on worker wages in plant i (Manski (1993)). First, there are several important factors that impact wages, such as labor quality and firm size. Failing to control for these factors could bias β if the manner through which peer effects operationalize inside diversified firms is correlated with these factors. For example, finding that some firms pay higher wages to workers in otherwise low-wage industries could be driven by firms hiring more productive workers. To alleviate this concern, I take advantage of the richness of the Census data and include a wide variety of controls for labor productivity, size, and age at the plant level. The inclusion of these plant-level, time-varying controls addresses the critique that two firms that operate in the same industry may have different productivity and different investment opportunities.

A second concern that may arise is the existence of unobservable, time-invariant, plant-specific characteristics that impact wages. For example, finding that a plant in a diversified firm pays higher wages to its workers relative to comparable stand-alone firms and that the wage difference is correlated with *peer* could be due to other factors not measured through the controls included in X. It might be that a plant had high wages even before it was a part of a diversified firm, for example.[19] To address this concern, I include plant fixed effects and analyze how the wages of workers respond to changes in compensation in other

[19]This is a critique raised by Chevalier (2000) regarding the literature that evaluates the impact of conglomerates on their investment policies.

divisions of the firm.

A final issue in interpreting β as the causal impact of peer effects on wages is that there may be time-varying, unobservable factors at the firm level. In other words, what I want to interpret as a treatment effect could, in fact, be a selection effect. To circumvent this problem, I make use of two quasi-experiments. The first uses a drastic change in trade barriers to generate exogenous variation in wages of some of the plants of a diversified firm. I then examine the evolution of wages in plants that are unaffected by the trade shock inside the same diversified firm, relative to similar plants of firms unaffected by the trade shock. Tracking the propagation of the shock toward the remaining plants of the affected firm relative to plants owned by firms not exposed to the shock allows me to difference away selection considerations that could be biasing the estimates. In a second quasi-experiment, I use the evolution of state-level minimum wages as a determinant of local wages and track the wages of workers in other states that are not directly affected by the changes in minimum wages but whose colleagues are (treatment group), relative to workers that are not directly or indirectly affected by these changes (control group). Taken as a whole, the results suggest a causal positive elasticity between the wages of workers in the different divisions of a firm.

IV Main Results

I start the empirical analysis by estimating the degree to which wages in one part of the firm vary with the level of wages in other divisions of the firm. Formally, I estimate the elasticity of own wages with respect to the wages of co-workers using the following regression specification:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot \textit{Log(Firm Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

Where for plant i in division d of firm f at time t, $\textit{Log(Firm Wage)}_{dft}$ is the natural logarithm of the average wage of workers in other divisions of a given firm. The set of controls X includes labor productivity at the plant level (*log(VA/hour)*), plant age, firm size, division size, plant size, and $Industry \times Year \times State$ fixed effects.[20] Moreover, because I want to distinguish between simply being diversified and the existence of peer effects in the wages of workers within the firm, the regression includes two measures of corporate diversification, *Divdummy* and *1-HHI Employees*, which allows for a non-linear relationship between diversification and wages.

The coefficient of interest is β, which measures the elasticity of workers' wages in plant i of firm f at time t, with respect to the wages of the workers in other divisions of firm f at time t. If firm boundaries and internal labor markets have no impact on the wage policy of firms, we would expect to find $\beta = 0$. Table II presents the findings. In Column 1, the estimate of the elasticity of workers' wages in plant i with respect to *Firm wage* is 0.064. This implies that a 100% increase in the wages of workers in other divisions of the firm leads to a 6.4% increase in the wages of workers in plant i. In addition, and in line with the results in Schoar (2002), diversified firms pay higher wages, on average.[21]

[20] All variables are defined in greater detail in the variable definition section.

[21] To see this, one has to sum the coefficient on *Divdummy*, and evaluate the impact of *1-HHI Employees* and *Log(Firm Wage)* at their respective means (by definition, both of these variables only take on positive values for diversified firms). The average *Log(Firm Wage)* in the full sample is 1.364. Since *Log(Firm Wage)* is zero for stand-alone firms (only about 880,000 of the 2,040,000 plants in the sample belong to diversified firms), the average of this variable conditional on being diversified is about 3.16 (= 2,040,000 * 1.364 / 880,000). Taking the estimates in Column 1 of Table II, one can then see that the average wage in diversified firms is higher

The empirical setting employed in Column 1 of Table II exploits the fact that stand-alone firms, by definition, do not suffer from cross-division intra-firm wage pressure, as they operate in a single industry. Plants owned by stand-alone firms are, therefore, used to provide a counterfactual level of wages that would be observed in the respective state, industry, and year if there were no peer effects in the wages of conglomerates. Comparing conglomerates to stand-alone firms is not new. The literature has often resorted to comparing investment of divisions of conglomerates to investment in stand-alone firms in the same industry. Similarly, the canonical way to study value creation in conglomerates has been to compare the value of a conglomerate firm to that of a pseudo-conglomerate constructed using a portfolio of stand-alone firms. The analysis in this regression differs from this literature in two fundamental ways. First, the granularity of the Census data allows for comparisons to be established not only across plants in the same industry (as is typical in the literature), but within the same industry and state. Second, the detailed, plant-level information that is available in the Census data makes it possible to control for important plant-level, time-varying characteristics such as age, size, and productivity. This addresses the concern that differences in productivity, for example, may be driving the differences in wages between two plants within the same industry.

The estimates in Column 2 differ from those of Column 1 in that the sample is restricted to include only diversified firms. Different conglomerates have different patterns of diversification (that is, the set of industries in which they operate), and the natural wage dispersion associated with those industries varies by firm and over time. Column 2 exploits these differences by comparing the wages of workers of different conglomerates in the same

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than that in stand-alone firms, as 3.16*0.064-0.195>0 and 1-HHI Employees is positive only for diversified firms. This can also be observed in the univariate comparisons presented in Appendix H.

three-digit SIC industry, state, and year, whose firms are diversified into different industries. It tests whether the workers of conglomerates diversified into high paying industries collect a premium relative to workers of conglomerates diversified into low wage industries. The estimated elasticity of 0.144 implies that workers of plant i collect a 1.44% increase in wages for each 10% increase in the wages of workers in other divisions of the firm.

In Column 3, the specification includes plant fixed effects and, as such, it also takes into account any time-invariant, unobservable characteristics of plants that could be biasing the results. In this specification, the sample includes only plants that do not change firm and, as a result, the variation in *Log(Firm Wage)* comes from firm's decision to enter and leave other industries and from the evolution of wages in the other divisions. The estimate of 0.014, implies that a 10% increase in *Firm Wage* is associated with a 0.14% increase in own wages.

The results in this table show the existence of a positive link between the wages of various workers within a firm. This effect is robust to the inclusion of a variety of different control variables, such as detailed, plant-level controls for labor productivity and plant fixed effects.

Next, I analyze whether the wage co-movement documented in Table II is driven by a lowering of the wages of the highest earners (top-down convergence) or by an increase in the wages of the lowest paid employees (bottom-up convergence). In Column 1 of Table III, I study whether workers in industries in the four lowest wage quintiles collect a premium when their firm is present in the highest wage quintile. The coefficient of interest is the one associated with *Present in q5.* The estimates in Column 1 show that low wage workers collect a premium of 3.6% when their firms also operate in the highest wages industries, relative to the case where wages are fully determined by productivity, size, age, degree of diversification, industry, state, and year. In Column 2, the analysis focuses on the other extreme and tests whether workers in the highest paid industries have a negative wage premium when their firm also operates in low wage industries. The results suggest that the degree of top-down convergence may not be the main driver of the results, as the coefficient associated with *Present in q1* is negative but economically and statistically insignificant. The asymmetric nature of the results shown in this table suggests that firms may not have as much latitude in decreasing wages in high-wage industries (without losing their employees) as they do in increasing wages in low-wage industries.

Table IV separately analyzes the salary component and the benefits component of compensation, in Panels A and B, respectively. The specifications used in this table are the same as the ones used in Columns 1 and 2 of Table II with the only change being the use of a different left-hand side variable. When focusing on Panel A, and analyzing the salary component of compensation, the implied elasticity between salary and the wages of workers in other divisions of the firm is 0.076 if the comparison is across all plants in the economy, and 0.146 if the comparison is done within the set of diversified firms only. This implies that a 10% increase in the wages of workers in other divisions of the firm is associated with a 0.76% to 1.46% increase in salary, respectively. Turning to the analysis of the benefits component of compensation, in Panel B of Table IV, we can observe that the estimates of the elasticity between own benefits and the wages of workers in other divisions of the firm are very similar to those estimated in Panel A. Focusing on the sample that includes plants owned by both diversified and stand-alone firms the coefficient on *Log(Firm Wage)* is 0.044, while in the sample that includes only diversified firms it is 0.143. Overall, the results in Table IV show that the wage convergence pattern found in table II is present in both the salary and benefit components of compensation.

Table IV includes another variation on the estimation. In Panel C, instead of using logs, the effects are estimated in levels. The difference between the two columns of Panel C is the sample used to perform the estimation. The first column of Panel C includes all plants, while the second column includes only plants owned by diversified firms. The interpretation of the coefficients is slightly different here. Given that *Firm Wage* is measured in thousands of dollars per year and *Wage/hour* is measured in dollars per hour, if we focus on the coefficients estimated in the sample containing only diversified firms, the estimate on the second column of Panel C implies that a $10,000 increase in the yearly wages of workers in other divisions of the firm is associated with 80 cents per hour higher wages. For a production worker working 40 hours per week for 52 weeks a year, this translates into a wage convergence effect of $2,080 per year.

V Evidence from a Quasi-Experiment: NAFTA

The analysis so far has shown a positive association between wages of workers across divisions of conglomerates that is not likely driven by plausible factors such as plant-specific, time-invariant attributes or differences in the quality of the labor force (which would manifest in labor productivity). However, there could be other time-varying, unobservable factors that might bias the results. If that was the case, the results in the previous section could be due to selection and would not imply a causal relation. This section exploits a quasi-experiment in order to rule out such explanations.

I use the implementation of the North American Free Trade Agreement (NAFTA) as an exogenous source of variation in the wages of workers of exporting plants. The thought experiment is as follows. Suppose there are two sets of non-exporting plants: plants that are affiliated with a diversified firm that has exporting plants ("treatment") and plants that are not affiliated with exporting plants ("control"). The experiment uses unaffiliated non-exporting plants as a control group to assess the counterfactual level of wages for treatment plants in the absence of the NAFTA shock. If the peer effects I documented earlier are operational, I expect the treatment plants in a diversified firm to respond to the exogenous wage change in exporting plants inside the firm boundaries. In other words, the identifying assumption is that, in the absence of peer effects, the treatment and control groups should have the same pattern of wages around the NAFTA event.

I use data from 1991 to 1996 to categorize plants into three groups. The first group contains plants that have strictly positive exports during the three years after NAFTA.[22] These are plants whose wages should be directly impacted by the NAFTA shock. I examine whether this is the case in the data in the "first-stage" analysis. Additionally, and because I am interested in studying how wages in one part of the firm affect the wages in the rest of the firm, I construct the treatment group, which includes plants that, despite being part of a non-exporting division, belong to a diversified firm that owns exporting plants in other segments.[23] The final group is the control group, which includes plants whose division has no exports and that belong to firms that, unlike the treatment group, do not have continuous exporting activity in the period 1994 to 1996. The analysis compares the evolution of wages in the treatment group relative to the control group.

[22] The Census collects information on exports at the plant level.

[23] I require that plants belong to divisions that have zero exports for the period of 1994 to 1996, but whose firm has strictly positive exports in other divisions for the period 1994 to 1996 in order to be part of the treatment group.

V.A NAFTA Agreement

The North American Free Trade Agreement (NAFTA) is an agreement signed by the governments of Canada, Mexico, and the U.S., creating a trade bloc in North America. The agreement came into force in January 1994. After being signed by the presidents of the U.S. and Mexico and the Canadian prime minister in December 1992, the agreement was ratified by the parliament or legislative branch of each of the three countries. January 1, 1994, brought the immediate elimination of tariffs on more than half of U.S. imports from Mexico and more than one-third of U.S. exports to Mexico. Within 10 years of the implementation of the agreement, all U.S.-Mexico tariffs would be eliminated except for some U.S. agricultural exports to Mexico that were to be phased out in 15 years. Most U.S.-Canada trade was already duty free. NAFTA represents a major change in import and export barriers within North America that is exogenous to the network of plants owned by a firm. The analysis focuses on the three years before and after NAFTA came into effect (i.e., 1991 to 1993 as period before and 1994 to 1996 as period after).

V.B Impact on Wages of Exporting Plants

This subsection presents evidence that the NAFTA shock altered the wages of exporting plants. This is a critical first step to establish before I am able to trace the effects of this wage increase on treated plants relative to control plants. Column 1 of Panel A of Table V presents the coefficients from estimating the following regression specification:

$$Log(Wage/hour)_{idft} = \alpha + \beta_1 \cdot Exports_{idf} + \beta_2 \cdot After_t + \beta_3 \cdot (After_t \times Exports_{idf}) + X'_{idft}\gamma + \epsilon_{idft}$$

where *After* is a dummy variable that takes a value of one in the period after the NAFTA shock, and zero otherwise; and *Exports* is a dummy variable that takes the value of one if the plant has strictly positive exports every year between 1994 and 1996. The coefficient of interest is β_3, which estimates how direct exposure to NAFTA (measured by exports) impacts wages. Since the identification exploits time-series variation, the regression sample also includes plants that belong to firms that never export during 1994 to 1996 to account for any macroeconomic trends. Therefore, the specification can be thought of as a difference in difference estimation of wages in exporting plants relative to unaffiliated non-exporting ones. The vector of controls, X includes *log(VA/hour)*, *Age*, *Firm size*, *Division size*, *Plant size*, *1-HHI Employees*, plant fixed effects, and $Year \times Industry$ fixed effects.

The first-stage analysis shows that workers in exporting plants experience an increase in their wages after NAFTA relative to those of workers in the control group.[24] The effects are both statistically and economically significant. The estimates show an increase in wages of 2.2% for exporting plants relative to non-exporting plants after the NAFTA shock. In addition, plants that experience larger productivity increases also experience larger wage increases. Figure 1 depicts the evolution of wages for the exporting plants versus those in non-exporting firms around the implementation of NAFTA. The figure confirms that the workers of exporting plants saw a significant increase in their wages in the years 1994 through 1996 relative to workers in plants of firms that did not export in the three years after NAFTA. The evolution of wages was very similar for both groups before 1994.

It is not clear ex-ante whether the NAFTA agreement would lead to an increase or a decrease in the wages of exporting plants. On one hand, because these plants face

[24] This is consistent with results in Bernard and Jensen (1997) that also show increases in wages associated with exporting activity.

international trade competition from Mexico and Canada, there might be downward pressure on wages. On the other hand, the agreement might provide access to new markets for exporting plants, which helps the plants increase their profits, demand for labor, and worker wages. The analysis suggests that the latter effect is dominant in the period of the analysis. For the subsequent tests, I am agnostic about the exact reasons for this wage increase in exporting plants. Rather, I use this fact to assess the wage response in non-exporting plants of diversified firms with exporting plants that saw a wage increase for their workers after NAFTA.

V.C Wages in Treatment and Control Groups before NAFTA

Before establishing an effect on the treatment group relative to the control group after the NAFTA shock, I need to establish that there was no differential pattern in wages between the two sets of plants before the shock. I now show that this is indeed the case. Figure 2 shows the wage evolution of the treatment group relative to the control group. As is evident for the periods before the shock (1991 to 1993), there is no statistical difference in the evolution of wages of the workers in the treatment group compared to the wages of workers in the control group. This suggests that the treatment and control groups are very comparable before the NAFTA shock.[25]

[25] This also ensures that other factors that were present throughout this period are not driving the results. For example, the U.S. Dollar was appreciating over the period of 1994 to 1996, and that could have had a role in the results. Since this pattern in the U.S. Dollar was also present in the period of 1991 to 1993, and we do not find differences in the evolution of wages in that period, it is difficult to argue that the results are driven by the evolution of the Dollar.

V.D NAFTA Experiment - Main Findings

In this subsection, I test whether wage increases in exporting plants due to the implementation of NAFTA are transmitted to non-exporting plants within the firm. I report results from estimating the following regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta_1 \cdot Firm\ Export_{df} + \beta_2 \cdot After_t + \beta_3 \cdot (After_t \times Firm\ Export_{df}) + X'_{idft}\gamma + \epsilon_{idft}$$

Where for plant i in division d of firm f at time t, $Firm\ Export_{df}$ is a variable that identifies the treatment group of plants (those whose firm exports between 1994 and 1996). This variable is a time-invariant dummy that takes the value one if the firm to which plant i belongs to has positive exports in divisions other than the one in which plant i operates in, and takes the value of zero otherwise. As before, the variable $After$ takes the value of one in the three years after NAFTA was introduced (1994, 1995, and 1996), and takes the value of zero in the three years before NAFTA (1991, 1992, and 1993). Because the set of controls X includes $Industry \times Year$ fixed effects, the variable $After$ is absorbed in the regression. This "second-stage" regression includes only plants in the treatment and control groups (i.e., all the plants included in this regression belong to segments that have zero exports for the period 1994 to 1996). The results are presented in Column 2 of Panel A of Table V. The coefficient of interest is β_3, which traces the potential effect of wage increases in exporting plants on wages of the treatment group. The control group serves as a counterfactual that accounts for macroeconomic and other factors that may also have changed and impacted worker wages of non-exporting plants around the NAFTA shock. The set of controls X are the same as the ones used in the regressions that measure the impact of NAFTA on exporting plants.

I find that β_3 is positive and statistically significant. This implies that wages in the treatment group increased after the NAFTA shock when the wages of exporting plants inside the diversified firm increased. This pattern of wages is also visible in Figure 2. This is consistent with peer effects within the diversified firm being an important determinant of wages. In terms of magnitude, the estimates in Column 2 of table V represent a 1.4% increase in wages for treated plants relative to the wages of workers in the control group. Given that the workers directly exposed to NAFTA (those in exporting plants) experienced a 2.2% increase in wages, the 1.4% increase for workers in non-exporting plants, represents a transmission of 64% of the wage shock within the firm.

V.E Placebo and Other Tests

I conduct several auxiliary tests to confirm the robustness of my findings. Exporting firms may be superior to non-exporting firms for unobservable reasons, such as managerial talent. Since the treatment group is selected based on exporting activity, what I am interpreting as a causal effect could, in fact, be a selection effect. To address this concern, I conduct a placebo test by choosing an alternative period for the analysis (1985 to 1990—the time period immediately before the one used for the main tests). Panel B (Columns 3 and 4) of Table V, presents the placebo test for this period and shows that there is no visible pattern in terms of changes in wages of exporting plants or non-exporting plants in diversified firms relative to unaffiliated non-exporting plants. These results confirm that exporting plants and non-exporting plants owned by exporting firms are not different from non-exporting plants owned by non-exporting firms in the absence of the NAFTA shock.

Another potential concern is that non-exporting plants may produce intermediate goods that serve as inputs to the exporting plants. As a result, non-exporting plants could be, *de facto*, exporting. To alleviate this concern, I rerun the second-stage regressions including only plants that have zero transfers to other plants in the firm—that is, restrict the sample to plants that do not supply other plants within the firm with intermediate inputs. This is feasible because the Census data contains information on interplant transfers within firms. The results are qualitatively and quantitatively similar to those reported before (see Panel C of Table V). This is not a surprise in light of the findings of Atalay et al. (2014), who show that interplant transfers are small, even for vertically-integrated firms. One limitation of this test is that even though the regressions in Panel C of Table V control for transfer of physical intermediate production inputs, they may not account for the possibility that intra-firm transfers of intangible inputs between exporting and non-exporting plants might affect wages. In other words, there could be synergies from knowledge sharing even if no physical interplant transfer occurs. Since the regressions control for *Log(Value Added)*, knowledge transfers would only bias the estimates if the productivity gain they create did not lead to a contemporaneous increase in value added. In Section VI.D, I discuss in further detail the specific pattern of productivity mismeasurement that would be required in order for the results to be explained by it.

V.F Summary

The results in this section document the existence of peer effects on wages inside diversified firms, which are unlikely to be driven by selection considerations. There are a few caveats to this analysis. First, information on exports is only available for the manufacturing sector, so there might be establishments outside of SIC sectors 20 to 40 that have exporting activity but are excluded from the analysis. While this is a potential source of bias, the results would still be relevant if the exclusion affects treatment and control groups similarly. Second, ideally, one would like control not only for export, but also for import activity. However, the Census data do not contain information on imports. As a result, I am not able to use imports to construct measures of exposure to NAFTA. To alleviate this concern, the regressions control for industry-by-year fixed effects, which account for differences in import competition at the industry level.

VI Evidence from State level Minimum Wage Changes

The previous section used the NAFTA agreement as a shock to the wages of workers in exporting plants and tracked the within-firm transmission towards the workers of non-exporting plants owned by exporting firms. This section uses a second source of exogenous variation to the wages of workers in a division of the diversified firm and trace the propagation towards the remaining (non-affected) workers within the firm boundaries. The source of exogenous variation that is exploited in this section is the evolution of state-level minimum wages during the sample period.

There are several features of the data that make this analysis feasible. First, several firms operate in multiple states—that is, conglomerates are not only diversified in terms of industry but often also geographically. Second, different states in the U.S. have different levels of minimum wage, and there have been several changes to minimum wages within the sample period. Importantly, not all states change their minimum wage at the same point in time. Thus, I exploit the staggered nature of the evolution of minimum wages at the state level in the analysis.

The thought experiment that I set up relies on two premises: 1) the wages of a worker depend on the evolution of minimum wages in the state s/he works in; this premise is testable in the data, and this relationship is presented in Panel A of Table VI; and 2) in the absence of peer effects, the wages of workers are not directly affected by the evolution of minimum wages in states other than their own. The identifying assumption requires that wages of workers in a state without minimum wage change not evolve differentially if their firm is present in a state in which the minimum wage changed, other than through the workings of internal labor markets. Since changes in state-level minimum wage are unlikely to be directly correlated with the wages of workers in states other than the one in which the change occurs, this is a plausible source of exogenous variation.

For the sake of clarity, let me introduce an example. Suppose firm A has two divisions: tables and shoes. Firm A produces tables in California and shoes in Massachusetts. Suppose also that there are two other firms in the economy. Firm B is a conglomerate that also produces tables in California but produces other products (potentially also shoes) in Texas, while firm C produces only tables in California. In my analysis, I test whether the wages of California table workers in firm A respond to the minimum wage evolution in Massachusetts, relative to the wages of California table workers in firms B and C. By contrasting the evolution of table workers in the same state, I can account for any local confounding effect at the industry level while exploiting uniquely the geographic distribution of firm boundaries and the evolution of minimum wages in the different states. I find that the wages of Californian table workers in firm A depend on the evolution of minimum wage in Massachusetts, relative to those of firms B and C. At the same time, the wages of Californian table workers of firm B depend on the evolution of minimum wages in Texas (relative to firms

A and C).

In the absence of peer effects and transmission of shocks within the firm, it is difficult to rationalize why the wages of workers in California depend on the evolution of the minimum wage level in Massachusetts when their firm operates in Massachusetts, while the wages of Californian workers in the same industry but whose firm does not operate in Massachusetts do not depend on Massachusetts minimum wages.

VI.A Impact on Local Wages

The first step in the analysis in this section involves studying the effect of the evolution of local minimum wage on local wages. As in the case of NAFTA, in order to study the internal transmission of a shock to wages, first one needs to establish that there is an effect to be transmitted. To do so, I obtain minimum wage data at the state level for all U.S. states between 1977 and 2000 from the U.S. Department of Labor.[26] I start by estimating an OLS regression of the following form:

$$Wage_{isdft} = \alpha + \beta \cdot Min\ Wage_{st} + X'_{isdft}\gamma + \epsilon_{isdft}$$

where $Wage_{isdft}$ is the yearly wage per worker of establishment i of firm f in state s and division d at time t and $Min\ Wage_{st}$ is the minimum wage in state s at time t. The sample used to estimate the OLS coefficients is the full LBD sample that contains information on all industries in the economy (not only the manufacturing sector). The vector X_{isdft} includes year fixed effects. The estimates from this regression are presented in Panel A of Table VI, where it can be seen that an increase in local minimum wage is associated with

[26] Available online at http://www.dol.gov/whd/state/stateMinWageHis.htm

an increase in average wages within the state.

I then use the predicted values obtained in this regression to construct a measure of firm wages as predicted by the evolution of state-level minimum wages. More specifically, I construct the variable $\mathit{Log(Firm\ Minwage)}_{sdft}$, where $\mathit{Firm\ Minwage}_{sdft} = \frac{\sum_{j,m \neq s, l \neq d} \widehat{wage_{jml}}_{ft} \times workers_{jmlft}}{\sum_{j,m \neq s, l \neq d} workers_{jmlft}}$. The sum is over all establishments j, in all divisions l other than division d, firm f operates in, in all states m the firm is present in (other than state s), at time t. This measure is similar in nature to *Log(Firm Wage)*, but instead of using the actual wages paid by the firm in other industries, it uses $\widehat{wage_{jml}}_{ft}$, where $\widehat{wage_{jml}}_{ft}$ are the wages as predicted by the evolution of minimum wages in states where the firm operates in, weighted by the respective number of workers.

VI.B Intra-firm Transmission of Minimum Wage Shocks

In the "second-stage," I study the impact of firm-level wages as predicted by the state minimum wages of other workers in the firm. I do so by estimating the following OLS regression:

$$Log(Wage/hour)_{isdft} = \alpha + \beta_1 \cdot \mathit{Log(Firm\ Minwage)}_{sdft} + X'_{isdft}\gamma + \epsilon_{isdft}$$

If firm boundaries were irrelevant for wage-setting policies, workers in state s should be unaffected by the minimum wage laws in the other states the firm operates in. On the other hand, if the peer effects I document are operational, I expect the wages of workers in state s to depend on minimum wages of state $m \neq s$ if the firm is also present in state m, relative to a control group of workers in state s but whose firm is not present in state m. Panel B of Table VI documents a positive link between the wages within the firm, confirming the results from previous sections. When workers in a state suffer a shock to their wages due to changes in the local minimum wage levels, that shock is propagated to the remaining workers of the firm in other states. This effect is relative to a control group of workers in the same industry and state but whose firm is not exposed to the minimum wage shock.

The results in this section imply that shifts in wages of workers in other divisions of the firm have a causal impact on wages of workers in plant i. The implied elasticity is as high as 0.224 when one focuses on the set of diversified firms with different exposure to minimum wage shocks. This implies a 2.24% increase in wages when the wages of workers in other divisions and states where the firm operates in suffer a 10% increase due to the evolution of minimum wages in their state. These results also suggest that the network structure of internal labor markets can act as a propagation mechanism for local economic shocks (Giroud and Mueller (2019)).

VII When Is Wage Co-movement Stronger?

VII.A Unionization

One factor that may have an important role in driving positive intra-firm wage spill-overs is the degree of labor unionization.[27] The level of labor unionization can affect the strength of the interdependence of wages within firms in several ways. First, it increases the degree of multilateral or firm-wide contracting, which could lead to more equalization in wages. Second, it may be a source of information about compensation in other areas of the firm, which could increase the salience of the wages of other workers in the firm. Third, it may be a source of bargaining power for workers and, consequently, a way for them to extract a

[27] For example, the *WSJ* article quoted in the introduction about the pay of auto workers notes the efforts of unions to achieve a flatter wage distribution.

larger share of the total economic value created by the firm. To measure labor unionization, I use the variable *Union*, which is the share of manufacturing workers that are unionized by state and year.[28] Column 1 of Table VII tests whether the dependence on wages of other workers in the firm is stronger when labor unionization is higher by estimating a regression of the following form:

$$Log(Wage/hour)_{isdft} = \alpha + \beta_1 \cdot \textit{Log(Firm Wage)}_{dft} + \beta_2 \cdot Union_{st} + \beta_3 \cdot \textit{Log(Firm wage)}_{dft} \times Union_{st} + X'_{isdft}\gamma + \epsilon_{isdft}$$

As before, the set of controls X includes log(VA/hour), plant age, firm size, division size, plant size, the diversification controls, and $Industry \times Year \times State$ fixed effects. Although the focus of this analysis is on the impact of labor unionization on the *elasticity* of the wages within the firm, labor unionization may also affect the *level* of wages. This effect is taken into account through the fixed effects employed in the regression. The results show that the sensitivity of wages to the compensation of workers in other divisions of the firm is stronger when the degree of labor unionization is higher. A 10 percentage point higher labor unionization rate is associated with a 1 percentage point increase in the elasticity of hourly wages to the wages of workers in other divisions of the firm.

VII.B Geographic Proximity

The theories that rely on social interactions or knowledge sharing depend on workers being in contact with each other. To understand whether close contact among workers is an important force behind the findings, I investigate whether the co-dependence of worker wages is stronger

[28] I also estimated the regressions using as a measure of unionization the share of workers in the manufacturing sector who are covered by a collective bargaining agreement, and the results are qualitatively similar.

when plants are geographically close to one another. When the different plants of the firm are geographically close, there is a higher probability that workers interact with each other, as they are more likely to live in the same neighborhood or share the same firm facilities, for example. In this sense, geographical proximity can serve as a proxy for the degree of social interactions and knowledge sharing between firm workers. To test whether geographic proximity is associated with stronger wage convergence, I estimate the following regression:

$$Log(Wage/hour)_{isdft} = \alpha + \beta_1 \cdot Log(\textit{Wage In State})_{isdft} + \beta_2 \cdot Log(\textit{Wage Out State})_{isdft} + X'_{isdft}\gamma + \epsilon_{isdft}$$

where the firm's plants are divided into two subgroups: the first group comprises plants that are geographically close to each other (within the same state), and the second group comprises plants that are geographically more distant. The variable $\textit{Wage In State}_{isdft}$ measures the wage level of the other establishments of the firm within state borders, while $\textit{Wage Out State}_{isdft}$ measures the wages in the firm's plants outside of state s, where plant i is located.[29] The test examines whether the wages in plant i are more sensitive to wages in plants in the former group relative to the latter. Column 2 of Table VII shows that geographical proximity is not associated with a higher sensitivity of wages to the wages of other workers. If anything, worker wages appear to be more sensitive to the wages of co-workers who are physically far away than to those who are geographically close.

[29]Formally: $\textit{Wage In State}_{isdft} = \sum_{j,l=s,m\neq d} \frac{\textit{Number of workers}_{jlmft} \times \textit{Wage/worker}_{jlmft}}{\sum_{j,l=s,m\neq d} \textit{Number of workers}_{jlmft}}$, if plant j is in the same state s as plant i, operates in a division m different from plant i and belongs to firm f at time t. And $\textit{Wage Out State}_{isdft} = \sum_{j,l\neq s,m\neq d} \frac{\textit{Number of workers}_{jlmft} \times \textit{Wage/worker}_{jlmft}}{\sum_{j,l\neq s,m\neq d} \textit{Number of workers}_{jlmft}}$, if plant j is in a different state l from plant i, a different division m than division d (the one that plant i belongs to), and is owned by firm f at time t.

VII.C Product Market Competition

Finally, I evaluate whether differences in the level of competition faced by firms in their product market affect the strength of peer effects in wages. If the pattern of wage convergence documented earlier is due to inefficient behavior by firms, one would expect competition to be a disciplinary device that would give less room for firms to pursue wasteful wage policies.[30] Furthermore, competitive pressure in the product market may reduce the bargaining power of workers and decrease their ability to collect wage premiums due to peer effects. To test the role of competition, I estimate an OLS regression of the following form:

$$Log(Wage/hour)_{idft} = \alpha + \beta_1 \cdot \mathit{Log(Firm\ Wage)}_{dft} + \beta_2 \cdot Comp_{dt} + \beta_3 \cdot (\mathit{Log(Firm\ Wage)}_{dft} \times Comp_{dt}) + X'_{it}\gamma + \epsilon_{it}$$

where the measure of competition *Comp* is the number of firms in each three-digit SIC industry.[31] The results, reported in Column 3 of Table VII, show that competition does impact the strength of the peer effects in the firm. When firms face stronger product market competition, there is a weaker cross-division link in workers' wages.

VII.D Discussion

The evidence in this section suggests that fairness considerations and social interactions between workers may not be the primary driver for the results, because workers in plants that are physically close to each other do not seem to exhibit a greater tendency toward pay convergence than those that are far apart. This evidence is not conclusive, however, as labor

[30] Using changes in the degree of import competition, Bertrand (2004) finds that internal labor markets lose importance in terms of shielding wages from the external market forces when firms operate in a more competitive environment.

[31] *Comp* is defined in thousands at the industry-year level and, as such, β_2 is absorbed by the $Industry \times Year \times State$ fixed effects.

unionization could promote more social contact among the workers of the firm. On the other hand, intra-firm equity seems to arise primarily when there is a high degree of labor unionization and reduced competition. This suggests that a larger bargaining power and the decision by firms to set rules that apply broadly to their workforce may be the primary drivers of the findings.

Note that these results do not imply that diversification is inefficient. If diversification leads to a large increase in productivity, equity holders may find higher wages to be a small cost relative to the benefits of diversification. What these results suggest is that the size of the synergies that are required to support a decision to diversify into areas where workers obtain vastly different wages is higher than the synergies needed to justify a decision to diversify into industries with similar levels of wages. In that sense, wage convergence can be seen as a cost of diversification even if, in some cases, there might be benefits that justify incurring in it.

The results in this section also help distinguish the findings in this paper from those of Tate and Yang (2015), who argue that workers in conglomerates acquire skills related to the industries in which the conglomerate firm operates. The acquisition of these skills is facilitated by ease of mobility in internal labor markets. This, in turn, leads to an improvement in the outside options of workers in conglomerates relative to stand-alone firms, which ultimately results in higher wages.[32]

Even though human capital acquisition in conglomerates may impact wages, it is unlikely that this mechanism is the primary driver of the results in this paper. In Section

[32]In theory, when firms provide better career prospects for employees that could also allow the firm to pay *lower* wages (e.g., Tavassoli et al. (2014) show that firms with strong brands are able to pay lower wages to their senior executives).

VII.C, I show that there is less wage convergence in more competitive industries. More competitive industries should be associated with more liquid external labor markets and more readily available outside opportunities. If the only reason workers received higher wages was because their higher human capital increased their outside options, wages should be higher when there is more competition. The fact that wages increase less when there is more competition is inconsistent with improvement in outside options of workers in conglomerates being the source of the results. Additionally, if acquisition of skills or knowledge transfers facilitated through internal mobility in conglomerates was the main driver of the findings, one would expect the results to be stronger when divisions are in close proximity to one another. This is because geographic proximity should facilitate knowledge transfers and intra-firm mobility. Instead, the results suggest that close geographical proximity is not associated with stronger correlation of wages within the firm. Finally, it is difficult to see why unionization would strengthen the link between the wages within the firm if the only forces operating were related to human capital development. Instead, the evidence points to intra-firm equity as an important aspect determining the compensation policies of firms. To be clear, I do not mean to argue that the economic forces documented in Tate and Yang (2015) do not impact wages; rather, it appears that they are unlikely to be the driver of the findings in this paper.

The results in this section also cast doubt on the possibility that mismeasurement of labor productivity could be driving the findings in the paper. The reason is that one would require a very specific and intricate pattern of measurement error for it to explain the results. More specifically, one needs measurement error in productivity to be larger when unionization is higher but smaller in more competitive industries.

VIII Wage Convergence and Investment

VIII.A Capital-Labor Ratios

The wage convergence pattern documented in the first part of the paper implies the existence of a wedge between the wages of workers in diversified and non-diversified firms. Among diversified firms, there will also be a wedge that depends on the distribution of wages in the different divisions of the firm. Provided that capital and labor are not perfect complements in production, firms should exhibit some degree of substitutability between these two inputs. Plants that remunerate their labor above (external) market levels due to peer effects should move away from the relatively expensive labor input and substitute toward capital as an optimal response to the wedge in input prices. In this section, I examine the relation between the capital labor ratio in a plant and the average wages of workers in the other divisions of the firm. Column 1 of Table VIII shows the coefficients from estimating the following OLS regression:

$$Log(K/L\ Ratio)_{idft} = \alpha + \beta_1 \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

The results in Column 1 of Table VIII show that the input use in a given division depends on the level of wages of workers in other divisions of the firm. More specifically, the use of capital relative to labor in production depends positively on the level of wages in other divisions of the firm. The estimated coefficient implies that a 10% increase in the wages of workers in other divisions of the firm leads to a 2.62% increase in the use of capital relative to labor. One potential explanation for this finding is that when the wages of workers in other divisions of the firm are high, the wages of workers of plant i converge upwards, leading them to command a wage premium relative to the wage level that would be implied by their labor productivity. The firm, in turn, internalizes this labor cost when deciding on the mix of inputs to use in production. In cases where labor is relatively more expensive, plants optimally respond by automating production (i.e., using more machines and fewer workers). One caveat with these results is that they are correlations and, as such, other explanations are possible.

VIII.B Investment

Next, I examine how the wage patterns documented in the first part of the paper correlate with investment. First, I replicate previous results in the literature that studies investment decisions of conglomerates by estimating regressions of the form:

$$CAPX/Sales_{ift} = \alpha + \beta_1 \cdot \textit{1-HHI Employees}_{ft} + X_{it}'\gamma + \epsilon_{it}$$

where the vector X includes plant age, firm size, division size, plant size, and $Industry \times Year \times State$ fixed effects. The results from estimating this equation are presented in Columns 2, 4, and 6 of Table VIII. Column 2 of Table VIII shows that, on average, diversified firms do not have significantly higher (or lower) investment rate than their stand-alone counterparts, as the coefficient on *1-HHI Employees* is statistically insignificant. The differences in investment between stand-alone and conglomerate firms only appear when one distinguishes between high- and low-growth divisions. Column 4 shows that low-investment segments in diversified firms tend to have higher investment levels than their stand-alone counterparts, while Column 6 shows that diversified firms tend to invest less in high-investment segments than do comparable stand-alone firms. This pattern of investment is a well-established empirical fact and has been referred to as "socialistic" investment or the "dark side" of internal capital markets (see, for example, Stein (1997) for a theoretical argument and Scharfstein (1998) for empirical evidence).

In this section, I evaluate how the differences in investment between conglomerates and stand-alone firms correlate with plant-level wages. The goal is to test whether forces in internal labor markets may provide an explanation for the pattern of investment previously documented in the literature. The positive correlation between *Log(Firm Wage)* and *K/L Ratio* suggests that plants where workers collect higher wages due to peer effects may invest more as they substitute away from labor towards capital. However, this may not be the case. The reason is that while capital-labor ratios capture a substitution effect between labor and capital, investment may also change due to a scale effect—excessively high compensation in low-wage divisions of conglomerates could lead to a reduction in scale and, therefore, to lower investment. Thus, the net result once the substitution and scale effects are taken into consideration is theoretically ambiguous.

To study the relation between the within-firm wage spillovers documented in the first part of the paper and the investments in internal capital markets, I add to the specification above the variable *Log(Firm Wage)* that serves as a measure of the pressure for wage convergence within the firm. More specifically, in Columns 3, 5, and 7 of Table VIII, I estimate the following OLS regression:

$$CAPX/Sales_{idft} = \alpha + \beta_1 \cdot \textit{Log(Firm Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

Column 3 shows that, using the full sample of plants, investment in plant i depends positively on the wages of workers of the firm in divisions other than the one plant i operates in. The coefficient 0.309 implies that a 100% increase in the wages of workers in other divisions of the firm is associated with an increase in investment of 0.3, which corresponds to about 10% of the average investment by the plants in the sample.

Next, I separate the sample into high- and low-growth industries, where high- and low-growth are defined as industry investment above and below the median, respectively. In Column 5, the focus is on low growth divisions, and in Column 7, attention is devoted to high-growth divisions. The results are striking, in Column 5, when one includes a control for firm wages in other divisions of the firm, the variable *Divdummy* is negative, while the variable *1-HHI Employees* becomes statistically insignificant and the point estimate closer to zero. Moreover, when analyzing the impact of wage convergence on the high growth divisions in Column 7, we observe that the magnitude and statistical significance of the coefficient on *1-HHI Employees* becomes more negative. The coefficients on the variable of interest *Log(Firm Wage)* are always statistically and economically significant. These findings suggest that internal labor markets may have an important role in shaping investment policies in internal capital markets.

IX Robustness

In Appendices A through G, I confirm the robustness of the findings by presenting the main results of the paper using various measures of diversification, different levels of fixed effects, and different ways of clustering standard errors. Appendix A presents analysis using *Divdummy* and *log(number of divisions)* as the measures of corporate diversification. In Appendix B, I present the impact of wage on investment, where wages are instrumented with labor unionization, the wages of workers in other divisions of the firm, and the interaction between unionization and the wages in other divisions. In Appendix C, diversification is defined at the two-digit SIC level. Appendix D replaces *State* $\times$ *Year* $\times$ *Industry* fixed effects with separate fixed effects for State, Year, and Industry. In Appendix E, geography is measured at the county level, instead of at the state level. In Appendices F and G, the standard error clustering is done at the plant and year levels, respectively. Finally, Appendix H presents additional results on the distribution of hourly wages of productions workers in stand-alone and diversified firms, as well as the evolution of employment in the manufacturing sector in the U.S. between 1975 and 2005.

X Conclusion

In this paper, I address the question: What is the cost of bringing more activity into a firm? I present a new answer that suggests that an important source may be related to the way workers are paid. I examine the nature of worker wages inside diversified firms and document evidence for *wage convergence*: workers in low-wage industries collect higher-than-industry wages when the diversified firm is also present in high-wage industries. In addition, plants where workers collect higher than industry wages operate with higher capital-labor ratios. These results suggest that some of the capital "misallocation" previously documented in the literature might be due to an optimal response to the wages set in internal labor markets.

Most research in economics and finance has focused on examining investment behavior inside internal capital markets without regard to internal labor markets. The findings in this paper suggest that a firm may have to pay higher wages when it combines two different activities (as in a conglomerate) than when those activities are undertaken by separate firms. Moreover, I provide evidence that decisions taken by firms in their internal labor markets may impact their investment behavior. Therefore, it may be critical to understand the functioning of internal labor markets in order to advance our assessment of what drives investment decisions in internal capital markets.

The results in the paper also open new avenues for future research: anticipating the labor costs associated with merging two divisions with large disparity of wages may prevent firms from combining such activities in the first place. As such, the results in this paper have implications for the study of Mergers & Acquisitions.

It is important to note that these results do not imply that corporate diversification is value destroying. While the documented pattern in wages can be thought of as a cost of internal labor markets for firms, there may be benefits of these markets, too. One such mechanism is the possibility of allocating workers across divisions within firms, which may allow for better matching between workers and industries and, consequently, in higher productivity. The recent work of Tate and Yang (2015) and Tate and Yang (2016) provides evidence supporting the existence of this bright side of internal labor markets.[33]

[33]In addition, there is anecdotal evidence that suggests this is an important consideration for several diversified firms. For example, General Electric advertises itself on its website as an excellent place to work due to the large number and diverse set of possible career paths: "GE is renowned for hiring exceptional people and giving them unparalleled opportunities to build their career and capabilities. There is simply no other company in the world with such a diverse set of businesses in which to work."

Table I: Summary Statistics

This table presents the summary statistics—number of observations (rounded to the nearest 100,000), mean, and standard deviation—for the variables of interest in the paper. All variables are defined in the Variable Definition section of the paper.

Variable	Rounded N	Mean	Standard Deviations
Log(Wage/hour)	2,000,000	2.493	.563
Log(Firm Wage)	2,000,000	1.364	1.619
Log(K/L)	1,200,000	2.741	1.263
CAPX/Sales	2,000,000	3.423	6.406
Age	2,000,000	10.104	6.670
Firm Size	2,000,000	.700	2.960
Division Size	2,000,000	.109	.728
Plant Size	2,000,000	.015	.048
Union	1,500,000	19.631	9.855
Comp	2,000,000	2.195	3.504

Table II: Wage Convergence in the Cross-Section and in the Time-Series

This table shows the relationship between own wages and the wages of workers in other divisions of the firm. The table contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}.$$

Panel A contains cross section regressions and Panel B exploits within-plant variation. In Panel A, the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus the Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Column 2, the regressions include only diversified firms and, as such, the control variable *Divdummy* is absorbed. Panel B (Column 3) presents the within-plant estimates for the sample of plants that did not change firm during the sample period, with the set of controls X including $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *Divdummy*, *1-HHI Employees*, *Industry* × *Year* fixed effects, and Plant Fixed Effects. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Panel A		Panel B
	Log(Wage/hour)		Log(Wage/hour)
	(1)	(2)	(3)
Log(Firm Wage)	0.064***	0.144***	0.014***
	(0.003)	(0.004)	(0.003)
log(VA/hour)	0.242***	0.170***	0.175***
	(0.002)	(0.002)	(0.002)
Divdummy	-0.195***		-0.048***
	(0.009)		(0.010)
1-HHI Employees	0.093***	0.101***	0.020*
	(0.007)	(0.007)	(0.012)
Age	0.007***	0.007***	0.003**
	(0.000)	(0.000)	(0.002)
Firm Size	0.008***	0.008***	0.001
	(0.001)	(0.001)	(0.002)
Division Size	0.001	0.001	-0.002
	(0.005)	(0.004)	(0.004)
Plant Size	0.510***	0.488***	-0.208***
	(0.052)	(0.052)	(0.061)
Rounded N	2,000,000	900,000	1,400,000
R-squared	0.710	0.739	0.885
State × Year × Industry FE	Yes	Yes	No
Plant FE	No	No	Yes
Industry × Year FE	No	No	Yes

Table III: Top-Down vs. Bottom-Up Convergence in Wages

This table shows the relationship between own wages and the wages of workers in other divisions of the firm. The specifications include dummies that indicate the presence of the firm in the highest and lowest wage industries in the economy as a way to test whether wages converge from the bottom-up, from the top-down, or both. Column 1 contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot \textit{Present in q5}_{ft} + X'_{ift}\gamma + \epsilon_{ift},$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, size controls at the firm, division and plant level, *State* × *Year* × *Industry* fixed effects, and one minus the Herfindahl Index of Employees at the different divisions of the firm as a measure of corporate diversification (where firm divisions are defined at the three-digit SIC level). $\textit{Present in q5}_{ft}$ is a dummy variable that takes the value of one if the firm has at least one establishment in an industry whose wages are in quintile 5 of the wage distribution in year t. Column 1 includes only plants that operate in wage quintiles 1 to 4.

Column 2 presents coefficients obtained by estimating the following OLS regression:

$$Log(Wage/hour)_{ift} = \alpha + \beta \cdot \textit{Present in q1}_{ft} + X'_{ift}\gamma + \epsilon_{ift},$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, size controls at the firm, division and plant level, *State* × *Year* × *Industry* fixed effects, and one minus the Herfindahl Index of Employees at the different divisions of the firm as a measure of corporate diversification (where firm divisions are defined at the three-digit SIC level). $\textit{Present in q1}_{ft}$ is a dummy variable that takes the value of one if the firm has at least one establishment in an industry whose wages are in quintile 1 of the wage distribution in year t. Column 2 includes only plants that operate in wage quintiles 2 to 5. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and * respectively.

	Log(Wage/hour)	
	(1)	(2)
Present in q5	0.036***	
	(0.003)	
Present in q1		-0.000
		(0.004)
log(VA/hour)	0.249***	0.244***
	(0.002)	(0.002)
1-HHI Employees	0.057***	0.092***
	(0.006)	(0.005)
Age	0.007***	0.007***
	0.000	(0.000)
Rounded N	1,600,000	2,000,000
R-squared	0.693	0.706
State × Year × Industry FE	Yes	Yes
Firm, Division and Plant Size Controls	Yes	Yes

Table IV: Convergence in Salary, Benefits, and Wages in Levels

This table shows the relation between own compensation and the compensation of other workers in the firm. The table contains the coefficients from estimating the following OLS regression:

$$Y_{idft} = \alpha + \beta \cdot \textit{Log(Firm Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft},$$

where Y is *Log(Salary/hour)* in Panel A (columns (1) and (2)), and *Log(Benefits/hour)* in Panel B (columns (3) and (4)). Panel C (columns (5) and (6)) contains the coefficients from estimating the following OLS regression:

$$Wage/hour_{idft} = \alpha + \beta \cdot \textit{Firm Wage}_{dft} + X'_{idft}\gamma + \epsilon_{idft}.$$

The matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the 3 digit SIC level), and *Divdummy*. In columns (2), (4), and (6) the regressions include only diversified firms and, as such, the variable *Divdummy* is absorbed. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and * respectively.

	Panel A		**Panel B**		**Panel C**	
	Log(Salary/hour)		Log(Benefits/hour)		Wage/hour	
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Firm Wage)	0.076***	0.146***	0.044***	0.143***		
	(0.003)	(0.004)	(0.004)	(0.006)		
Firm Wage					0.061***	0.080***
					(0.003)	(0.004)
log(VA/hour)	0.175***	0.108***	0.275***	0.215***	3.635***	2.928***
	(0.001)	(0.002)	(0.002)	(0.003)	(0.028)	(0.051)
Divdummy	-0.245***		-0.125***		-1.886***	
	(0.010)		(0.013)		(0.098)	
1-HHI Employees	0.071***	0.078***	0.134***	0.138***	1.322***	1.521***
	(0.006)	(0.006)	(0.009)	(0.009)	(0.119)	(0.122)
Age	0.006***	0.006***	0.007***	0.009***	0.093***	0.110***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.005)
Firm Size	0.007***	0.007***	0.007***	0.007***	0.115***	0.113***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.019)	(0.017)
Division Size	0.004	0.004	-0.002	-0.001	0.080	0.079
	(0.005)	(0.004)	(0.004)	(0.004)	(0.097)	(0.092)
Plant Size	0.362***	0.379***	0.666***	0.565***	9.714***	9.605***
	(0.047)	(0.048)	(0.063)	(0.056)	(0.877)	(0.930)
Rounded N	2,000,000	900,000	2,000,000	900,000	2,000,000	900,000
R-squared	0.636	0.692	0.678	0.655	0.627	0.654
State × Year × Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Table V: Exogenous Shock - The NAFTA Agreement

This table exploits the introduction of the NAFTA agreement as a source of exogenous variation for the wages of workers in exporting plants and tracks the transmission to the remaining (non-exporting) plants of the firm. The coefficients reported in Column 1 are obtained by estimating the following OLS regression in the period of 1991 to 1996:

$$Log(Wage/hour)_{idft} = \alpha + \beta_1 \cdot Exports_{idf} + \beta_2 \cdot After_t + \beta_3 \cdot (After_t \times Export_{idf}) + X'_{idft}\gamma + \epsilon_{idft}$$

The sample used in Column 1 includes only exporting plants (those that export continuously during 1994 to 1996) and plants owned by firms with zero exports for all years after NAFTA. *Export* is a dummy variable that takes the value of one during the six years (1991 to 1996) if the firm exports for the three years after NAFTA. *After* is a dummy variable that takes the value one in the years 1994 to 1996. The estimates in Columns 2 and 5 are obtained by estimating the following OLS regression in the period 1991 to 1996:

$$Log(Wage/hour)_{idft} = \alpha + \beta_1 \cdot Firm\ Export_{df} + \beta_2 \cdot After_t + \beta_3 \cdot (After_t \times Firm\ Export_{df}) + X'_{idft}\gamma + \epsilon_{idft}$$

The sample used in Columns 2 and 5 includes only plants that belong to divisions with zero exports every year after NAFTA. *Firm Export* is a dummy variable that takes the value of one during the six years (1991 to 1996) if the firm has strictly positive exports in all three years after NAFTA. The sample used in Panel C is similar to that of Column 2 with the additional filter that only plants with zero interplant transfers are included.
Panel B presents results from a placebo test during the period 1985 to 1990. The sample used in Column 3 includes only exporting plants in the placebo treatment period (those that export continuously during 1988 to 1990) or plants owned by firms with zero exports between 1988 and 1990. The indicator variable *Placebo Exports* takes the value of one if the firm exports in the three years after 1987. *Placebo After* is a dummy variable that takes the value of one in the years 1988 to 1990. The sample used in Column 4 includes only plants that belong to divisions with zero exports in the period of 1988 to 1990. *Placebo Firm Export* is a dummy variable that takes the value of one during the six years (1985 to 1990) if the firm has strictly positive exports in all three years after 1987.
In all columns, the matrix of controls X includes $log(VA/hour)$, firm size, division size, plant size, plant age, plant fixed effects, *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), and 1-HHI Employees as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). It also includes a measure of wages at the three-digit SIC, state and year levels—the median wage of stand-alone firms by *State* × *Year* × *three-digit SIC Industry*. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Panel A		Panel B		Panel C
	Log(Wage/hour)		Log(Wage/hour)		Log(Wage/hour)
	(1)	(2)	(3)	(4)	(5)
After × Export	0.022***				
	(0.005)				
After × Firm Export		0.014***			0.014**
		(0.005)			(0.006)
Placebo After × Placebo Export			0.008		
			(0.006)		
Placebo After × Placebo Firm Export				0.005	
				(0.005)	
log(VA/hour)	0.108***	0.077***	0.103***	0.069***	0.081***
	(0.005)	(0.004)	(0.005)	(0.004)	(0.005)
Rounded N	40,000	60,000	40,000	50,000	40,000
R-squared	0.910	0.894	0.891	0.880	0.895
Controls	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes
Plant FE	Yes	Yes	Yes	Yes	Yes

Table VI: State Minimum Wage as an Instrument for Firm Wage

This table estimates the relation between the wages of workers within the firm and uses the evolution of minimum wage at the state level as a source of exogenous variation to wages of workers in the state. It then tracks the propagation to workers of the firm in other states. The coefficients in Panel A are obtained by estimating the following OLS regression:

$$Wage_{isdft} = \alpha + \beta \cdot Min.\ Wage_{st} + X'_{isdft}\gamma + \epsilon_{isdft},$$

where the matrix of controls X includes year fixed effects.
The coefficients in Panel B are obtained by estimating the following OLS regression:

$$Log(Wage/hour)_{isdft} = \alpha + \beta \cdot Log(Firm\ Minwage)_{isdft} + X'_{isdft}\gamma + \epsilon_{isdft},$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, and *State* × *Year* × *Industry* fixed effects (where Industry is defined at the 3 digit SIC level), *Divdummy*, and one minus Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Column 1, the coefficients are estimated in the sample containing all plants, while in Column 2, the regressions includes only diversified firms with presence in multiple states and, as such, the control variable *Divdummy* is absorbed. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, ** and *, respectively.

Panel A: Impact of Minimum Wage level on Same State Wages

	Wage
	(1)
Minimum Wage	0.657***
	(0.001)
Year FE	Yes
N	129,000,000
R^2	0.0724

Panel B: Firm Wage Instrumented by Minimum Wage

	Log(Wage/hour)	
	(1)	(2)
Log(Firm Minwage)	0.013***	0.224***
	(0.001)	(0.045)
log(VA/hour)	0.243***	0.167***
	(0.002)	(0.003)
Divdummy	-0.014***	
	(0.003)	
1-HHI Employees	0.078***	0.101***
	(0.008)	(0.009)
Age	0.007***	0.007***
	(0.000)	(0.000)
Firm Size	0.008***	0.008***
	(0.001)	(0.001)
Division Size	0.003	0.004
	(0.005)	(0.006)
Plant Size	0.522***	0.508****
	(0.053)	(0.053)
Rounded N	2,000,000	800,000
R-squared	0.709	0.739
State × Year × Industry FE	Yes	Yes

Table VII: Mechanism Driving Wage Convergence

This table analyzes whether the strength of wage convergence within conglomerates depends on the degree of labor unionization, geographic proximity of plants, and product market competition. Column 1 presents estimates from the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta_1 \cdot \textit{Log(Firm Wage)}_{dft} + \beta_2 \cdot Union_{st} + \beta_3 \cdot \textit{Log(Firm Wage)}_{dft} \times Union_{st} + X'_{idft}\gamma + \epsilon_{idft}.$$

Column 2 presents the estimates from the following OLS regression:

$$Log(Wage/hour)_{isdft} = \alpha + \beta_1 \cdot \textit{Log(Wage In State)}_{isdft} + \beta_2 \cdot \textit{Log(Wage Out State)}_{isdft} + X'_{isdft}\gamma + \epsilon_{isdft}.$$

Column 3 presents estimates from an OLS regression similar to the one estimated in Column 1, with the only difference being the replacement of the variable *Union* with the variable *Comp*. The matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus the Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Column 2, because the sample only includes diversified firms with presence within the state and outside of the state the variable *Divdummy* is dropped from the regression. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(Wage/hour)		
	(1)	(2)	(3)
Log(Firm Wage)	0.071***		0.067***
	(0.003)		(0.003)
Log(Firm Wage) × Union	0.001***		
	(0.000)		
Log(Wage In State)		0.107***	
		(0.004)	
Log(Wage Out State)		0.163***	
		(0.007)	
Log(Firm Wage) × Comp			-0.002***
			(0.000)
log(VA/hour)	0.239***	0.152***	0.242***
	(0.002)	(0.003)	(0.002)
Divdummy	-0.271***		-0.193***
	(0.011)		(0.009)
1-HHI Employees	0.085***	-0.038***	0.091***
	(0.007)	(0.008)	(0.007)
Age	0.007***	0.007***	0.007***
	(0.000)	(0.000)	(0.000)
Firm Size	0.008***	0.007***	0.008***
	(0.001)	(0.001)	(0.001)
Division Size	0.004	0.000	0.001
	(0.005)	(0.003)	(0.005)
Plant Size	0.451***	0.413***	0.507***
	(0.049)	(0.047)	(0.052)
Rounded N	1,500,000	600,000	2,000,000
R-squared	0.600	0.757	0.710
State × Year × Industry FE	Yes	Yes	Yes

Table VIII: Impact of Internal Labor Markets on Investment Decisions

This table estimates the impact of wage convergence on the investment behavior of firms. Column 1 contains the coefficient from estimating the following OLS regression:

$$Log(K/L)_{idft} = \alpha + \beta \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}.$$

Columns 2, 4, and 6 contain the coefficient from estimating the following OLS regression:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot 1\text{-}HHI\ Employees_{ft} + X'_{idft}\gamma + \epsilon_{idft},$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, and *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level).
Columns 3, 5, and 7 contain the coefficient from estimating the following OLS regression:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Columns 1, 2, and 3, the estimates are on the full sample, while in Columns 4 and 5, the estimation is performed on low-investment divisions (those with investment below the median), and Columns 6 and 7 contain only high-investment divisions (those with investment above the median). Finally, in Columns 2, 4, and 6, the variables *Log(Firm wage)* and *Divdummy* are excluded from the estimation. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(K/L)	CAPX/Sales					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log(Firm Wage)	0.262***		0.309***		0.249***		0.384***
	(0.009)		(0.029)		(0.033)		(0.043)
Divdummy	-0.582***		-0.883***		-0.696***		-1.120***
	(0.031)		(0.098)		(0.108)		(0.146)
1-HHI Employees	0.414***	0.010	-0.111*	0.184***	0.077	-0.185***	-0.322***
	(0.027)	(0.039)	(0.067)	(0.042)	(0.070)	(0.055)	(0.098)
Age	0.013***	-0.056***	-0.057***	-0.054***	-0.055***	-0.059***	-0.060***
	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Firm Size	0.013***	0.010*	0.011**	0.001	0.002	0.016**	0.017***
	(0.002)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)
Division Size	0.010	-0.018	-0.027**	0.002	-0.004	0.038	0.013
	(0.010)	(0.014)	(0.012)	(0.014)	(0.015)	(0.042)	(0.036)
Plant Size	0.375***	3.278***	3.165***	2.381***	2.268***	3.845***	3.762***
	(0.081)	(0.531)	(0.525)	(0.540)	(0.532)	(0.594)	(0.588)
Rounded N	1,200,000	2,000,000	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
R-squared	0.546	0.119	0.119	0.117	0.117	0.095	0.096
State × Year × Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Figure 1: First Stage - Evolution of Wages around NAFTA: Exporting Plants vs. Non-Exporting Plants

This figure shows the evolution of wages of plants that export in all three years after NAFTA (1994, 1995, and 1996) versus those that belong to firms that do not export in any of the years from 1994 to 1996. All wages were de-trended using the average growth rate of the wages of firms that had zero exports. The triangle marker series (red line) shows the evolution of wages for the exporting firms, while the square marker series (blue line) shows the evolution of wages for the plants that belong to the non-exporting firms. The level of wages of workers in exporting plants has been normalized to match the wages of workers in non-exporting firms in 1993.

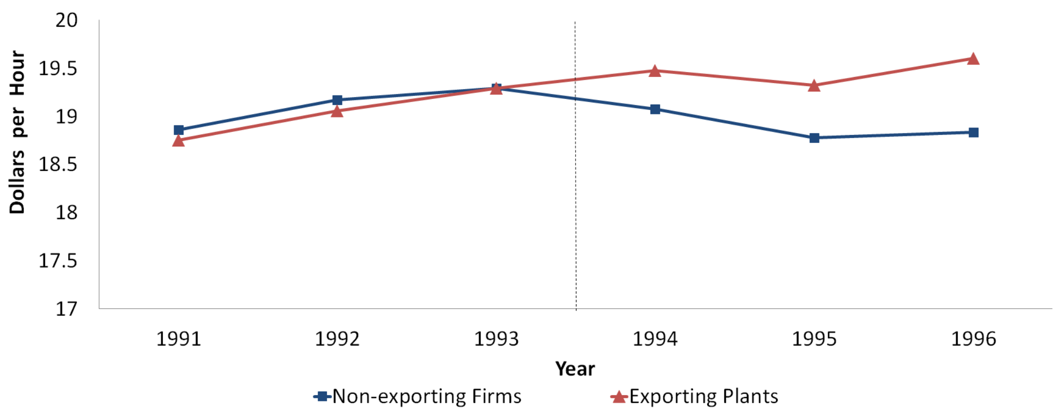
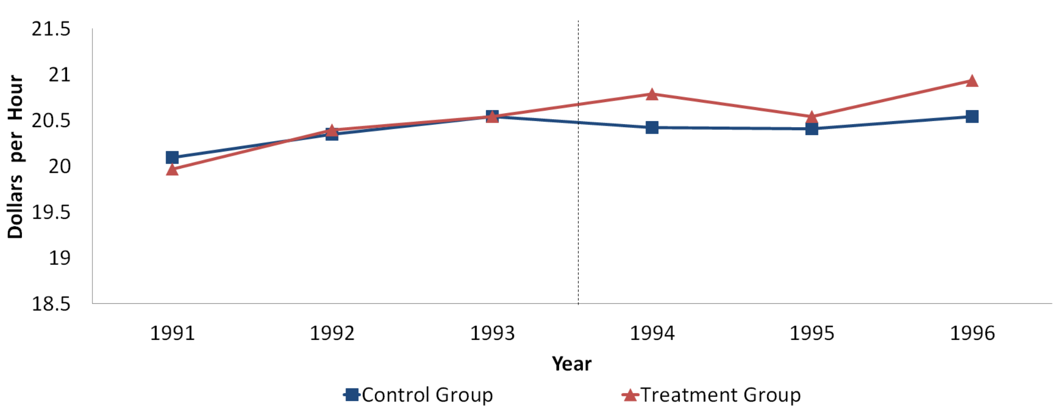


Figure 2: Second Stage - Evolution of Wages around NAFTA: Treatment vs. Control

This figure shows the evolution of wages of plants that belong to divisions that have zero exports for each of the years from 1994 to 1996. Within this group, some plants belong to firms that exported throughout the period 1994 to 1996, and other plants belong to non-exporting firms. All wages were de-trended using the average growth rate of the wages of firms that had zero exports. The triangle marker series (red line) shows the evolution of wages for plants owned by the exporting firms, while the square marker series (blue line) shows the evolution of wages for the plants that belong to firms that did not export continuously from 1994 to 1996. The level of wages of workers in the control group has been normalized to match the wages of workers in the treatment group in 1993.



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Online Appendix to "Internal Labor Markets, Wage Convergence, and Investment"

Appendix A

This appendix presents results with different measures of diversification. In particular, it reports results using the *Divdummy* indicator and *log(number of divisions)* as measures of corporate diversification.

Table A.I: Multivariate Analysis of Wages - Divdummy control

This table shows the relation between own wages and the wages of other workers in a firm. The main difference between the estimates in this table and those in the main text is that here only *Divdummy* is included as a diversification control. The table contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the 3 digit SIC level), and *Divdummy* . In Column 2, the regressions include only diversified firms and, as such, the control variable *Divdummy* is absorbed. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(Wage/hour)	
	(1)	(2)
Log(Firm Wage)	0.066***	0.147***
	(0.003)	(0.004)
log(VA/hour)	0.243***	0.172***
	(0.002)	(0.002)
Divdummy	-0.149***	
	(0.009)	
Age	0.007***	0.007***
	(0.000)	(0.000)
Firm Size	0.009***	0.009***
	(0.001)	(0.001)
Division Size	-0.000	-0.000
	(0.004)	(0.004)
Plant Size	0.507***	0.481***
	(0.053)	(0.052)
Rounded N	2,000,000	900,000
R-squared	0.709	0.738
State × Year × Industry FE	Yes	Yes

Table A.II: Impact of Internal Labor Markets on Investment Decisions - Divdummy control

This table estimates the impact of wage convergence on the investment behavior of firms. The main difference between the estimates in this table and those in the main text is that, here, only *Divdummy* is included as a diversification control. The table contains the coefficient from estimating OLS regressions of the type:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), and *Divdummy*. In Columns 1 and 2, the estimates are on the full sample, while in Columns 3 and 4, the estimation is performed on low-investment divisions (those with investment below the median), and Columns 5 and 6 contain only high-investment divisions (those with investment above the median). Finally, in Columns 1, 3, and 5, the variable *Log(Firm wage)* is excluded from the estimation. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	CAPX/Sales					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Firm Wage)		0.306***		0.251***		0.376***
		(0.029)		(0.033)		(0.043)
Divdummy	0.031	-0.933***	0.122***	-0.661***	-0.072**	-1.269***
	(0.021)	(0.092)	(0.023)	(0.102)	(0.032)	(0.136)
Age	-0.056***	-0.057***	-0.054***	-0.055***	-0.059***	-0.060***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Firm Size	0.010*	0.009*	0.003	0.003	0.013**	0.012**
	(0.005)	(0.005)	(0.007)	(0.006)	(0.006)	(0.006)
Division Size	-0.018	-0.024**	-0.002	-0.006	0.038	0.017
	(0.014)	(0.012)	(0.015)	(0.015)	(0.042)	(0.037)
Plant Size	3.252***	3.168***	2.353***	2.267***	3.830***	3.774***
	(0.530)	(0.525)	(0.540)	(0.532)	(0.593)	(0.589)
Rounded N	2,000,000	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
R-squared	0.119	0.119	0.117	0.117	0.095	0.096
State × Year × Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Table A.III: Multivariate Analysis of Wages - log(number of divisions) control

This table shows the relation between own wages and the wages of other workers in a firm. The main difference between the estimates in this table and those in the main text is that, here, instead of 1-HHI Employees, the variable *log(number of divisions)* is used as a control for corporate diversification. The table contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and *log(number of divisions)*. In Column 2, the regressions includes only diversified firms and, as such, the control variable *Divdummy* is absorbed. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(Wage/hour)	
	(1)	(2)
Log(Firm Wage)	0.062***	0.141***
	(0.003)	(0.004)
log(VA/hour)	0.242***	0.169***
	(0.002)	(0.002)
Divdummy	-0.194***	
	(0.009)	
log(number of divisions)	0.031***	0.032***
	(0.002)	(0.002)
Age	0.007***	0.007***
	(0.000)	(0.000)
Firm Size	0.005***	0.005***
	(0.001)	(0.001)
Division Size	0.003	0.003
	(0.004)	(0.004)
Plant Size	0.505***	0.484***
	(0.052)	(0.051)
Rounded N	2,000,000	900,000
R-squared	0.710	0.740
State × Year × Industry FE	Yes	Yes

Table A.IV: Impact of Internal Labor Markets on Investment Decisions - log(number of divisions) control

This table estimates the impact of wage convergence on the investment behavior of firms. The main difference between the estimates in this table and those in the main text is that, here, instead of 1-HHI Employees, the variable *log(number of divisions)* is used as a control for corporate diversification. The table contains the coefficient from estimating OLS regressions of the type:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot \mathit{Log(Firm\ Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and *log(number of divisions)* as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Columns 1 and 2, the estimates are on the full sample, while in Columns 3 and 4, the estimation is performed on low-investment divisions (those with investment below the median), and Columns 5 and 6 contain only high-investment divisions (those with investment above the median). Finally, in Columns 1, 3, and 5, the variables *log(Firm wage)* and *Divdummy* are excluded from the estimation. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

Table A.V: Impact of wage convergence on Investment - log(number of divisions) control

	CAPX/Sales					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Firm Wage)		0.312***		0.253***		0.387***
		(0.029)		(0.033)		(0.043)
Divdummy		-0.883***		-0.646***		-1.177***
		(0.096)		(0.106)		(0.143)
log(number of divisions)	0.000	-0.038**	0.041***	-0.011	-0.046***	-0.070**
	(0.012)	(0.019)	(0.013)	(0.021)	(0.017)	(0.028)
Age	-0.056***	-0.057***	-0.054***	-0.055***	-0.059***	-0.060***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Firm Size	0.011**	0.014**	-0.001	0.005	0.018***	0.019***
	(0.005)	(0.006)	(0.007)	(0.007)	(0.006)	(0.007)
Division Size	-0.018	-0.029**	0.003	-0.008	0.040	0.018
	(0.014)	(0.012)	(0.015)	(0.016)	(0.043)	(0.037)
Plant Size	3.282***	3.172***	2.398***	2.270***	3.833***	3.764***
	(0.532)	(0.525)	(0.545)	(0.534)	(0.592)	(0.587)
Rounded N	2,000,000	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
R-squared	0.119	0.119	0.117	0.117	0.095	0.096
State × Year × Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Appendix B

This appendix presents results of the impact of wages on investment by instrumenting plant-level wages with the wages of workers in other divisions of the firm, labor unionization, and the interaction between unionization and the wages of workers in other divisions of the firm.

Table B.I: Unionization Instrumented Investment Regressions

This table estimates the impact of wage convergence on the investment behavior of firms. The table contains the coefficient from estimating IV regressions of the type:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot Log(\widehat{Wage/}hour)_{idft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). *Log(Wage/hour)* is instrumented by *Log(Firm Wage)*, unionization, and the interaction of unionization and *Log(Firm Wage)*. In Column 1, the estimates are performed on the full sample, while in Column 2, the estimation is performed on low-investment divisions (those with investment below the median), and Column 3 contains only high-investment divisions (those with investment above the median). The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	CAPX/Sales	CAPX/Sales	CAPX/Sales
$Log(\widehat{Wage/}hour)$	1.853***	1.591***	2.188***
	(0.219)	(0.242)	(0.310)
Divdummy	-0.149***	0.055	-0.137*
	(0.049)	(0.047)	(0.074)
1-HHI Employees	-0.220**	0.005	-0.536***
	(0.093)	(0.094)	(0.132)
Age	-0.068***	-0.064***	-0.072***
	(0.002)	(0.003)	(0.003)
Firm Size	-0.005	-0.013	-0.004
	(0.009)	(0.008)	(0.013)
Division Size	-0.077***	-0.044**	-0.070
	(0.019)	(0.021)	(0.075)
Plant Size	3.360***	1.948***	4.177***
	(0.635)	(0.532)	(0.781)
Rounded N	1,500,000	700,000	700,000
R-squared	0.012	0.006	0.008
State × Year × Industry FE	Yes	Yes	Yes

Appendix C

This appendix presents results with industry defined at the two-digit SIC level.

Table C.I: Multivariate Analysis of Wages – two-digit SIC industries

This table shows the relation between own wages and the wages of other workers in the firm. The main difference between the estimates in this table and those in the main text is that, here, the industry definition is two-digit SIC codes. The table contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot Log(\mathit{Firm\ Wage})_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the two-digit SIC level), *Divdummy SIC2*, and one minus the Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the two-digit SIC level). In Column 2, the regressions includes only firms that are diversified at the three-digit SIC level. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(Wage/hour)	
	(1)	(2)
Log(Firm Wage)	0.020***	0.148***
	(0.001)	(0.004)
log(VA/hour)	0.243***	0.171***
	(0.002)	(0.002)
Divdummy SIC2	-0.022***	0.029***
	(0.005)	(0.005)
1-HHI Employees SIC2	0.053***	0.057***
	(0.008)	(0.007)
Age	0.007***	0.007***
	(0.000)	(0.000)
Firm Size	0.008***	0.008***
	(0.001)	(0.001)
Division Size	0.002	0.001
	(0.005)	(0.004)
Plant Size	0.516***	0.485***
	(0.052)	(0.051)
Rounded N	2,000,000	900,000
R-squared	0.709	0.739
State × Year × Industry FE	Yes	Yes

Table C.II: Impact of Internal Labor Markets on Investment Decisions – two-digit SIC industries

This table estimates the impact of wage convergence on the investment behavior of firms. The main difference between the estimates in this table and those in the main text is that, here, the industry definition is two-digit SIC codes. The table contains the coefficient from estimating OLS regressions of the type:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot \textit{Log(Firm Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the two-digit SIC level), *Divdummy* and one minus Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the two-digit SIC level). In Columns 1 and 2, the estimates are on the full sample, while in Columns 3 and 4, the estimation is performed on low-investment divisions (those with investment below the median), and Columns 5 and 6 contain only high-investment divisions (those with investment above the median). Finally, in Columns 1, 3, and 5, the variables *Log(Firm wage)* and *Divdummy* are excluded from the estimation. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	CAPX/Sales					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Firm Wage)		0.064***		0.062***		0.065***
		(0.013)		(0.015)		(0.020)
Divdummy SIC2		-0.069		-0.038		-0.113
		(0.056)		(0.062)		(0.084)
1-HHI Employees SIC2	-0.010	-0.173**	0.182***	-0.015	-0.221***	-0.330***
	(0.046)	(0.083)	(0.048)	(0.086)	(0.065)	(0.118)
Age	-0.056***	-0.057***	-0.053***	-0.054***	-0.059***	-0.059***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Firm Size	0.011**	0.012**	0.001	0.003	0.017***	0.017***
	(0.005)	(0.005)	(0.006)	(0.007)	(0.006)	(0.006)
Division Size	-0.019	-0.023*	0.002	-0.002	0.034	0.025
	(0.014)	(0.012)	(0.014)	(0.015)	(0.041)	(0.038)
Plant Size	3.287***	3.196***	2.413***	2.297***	3.834***	3.779***
	(0.532)	(0.528)	(0.542)	(0.534)	(0.594)	(0.591)
Rounded N	2,000,000	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
R-squared	0.119	0.119	0.117	0.117	0.095	0.095
State × Year × Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Appendix D

This appendix presents results with separate fixed effects for State, Year, and three-digit SIC Industry.

Table D.I: Multivariate Analysis of Wages - Separate Year, Industry, and State Fixed Effects

This table shows the relation between own wages and the wages of other workers in the firm. The main difference between the estimates in this table and those in the main text is that, here, instead of including State × Year × Industry fixed effects the regressions include separate fixed effects for State, Year, and Industry. The table contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot \textit{Log(Firm Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, State fixed effects, Year fixed effects, Industry fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus the Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Column 2, the regressions include only diversified firms and, as such, the control variable *Divdummy* is absorbed. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(Wage/hour)	
	(1)	(2)
Log(Firm Wage)	0.071***	0.156***
	(0.003)	(0.004)
log(VA/hour)	0.240***	0.172***
	(0.002)	(0.002)
Divdummy	-0.216***	
	(0.010)	
1-HHI Employees	0.099***	0.105***
	(0.008)	(0.007)
Age	0.007***	0.007***
	(0.000)	(0.000)
Firm Size	0.008***	0.007***
	(0.001)	(0.001)
Division Size	0.002	0.002
	(0.005)	(0.004)
Plant Size	0.524***	0.497***
	(0.054)	(0.052)
Rounded N	2,000,000	900,000
R-squared	0.670	0.680
State, Year and Industry FE	Yes	Yes

Table D.II: Impact of Internal Labor Markets on Investment Decisions - Separate Year, Industry, and State Fixed Effects

This table estimates the impact of wage convergence on the investment behavior of firms. The main difference between the estimates in this table and those in the main text is that, here, instead of including State × Year × Industry fixed effects the regressions include separate fixed effects for State, Year, and Industry. The table contains the coefficient from estimating OLS regressions of the type:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot \mathit{Log(Firm\ Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, State fixed effects, Year fixed effects, Industry fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Columns 1 and 2, the estimates are on the full sample, while in Columns 3 and 4, the estimation is performed on low-investment divisions (those with investment below the median), and Columns 5 and 6 contain only high-investment divisions (those with investment above the median). Finally, in Columns 1, 3, and 5, the variables *Log(Firm wage)* and *Divdummy* are excluded from the estimation. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	CAPX/Sales					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Firm Wage)		0.315***		0.265***		0.395***
		(0.030)		(0.032)		(0.044)
Divdummy		-0.901***		-0.728***		-1.170***
		(0.099)		(0.106)		(0.149)
1-HHI Employees	0.015	-0.108	0.227***	0.100	-0.223***	-0.344***
	(0.040)	(0.069)	(0.043)	(0.070)	(0.058)	(0.101)
Age	-0.054***	-0.056***	-0.052***	-0.054***	-0.056***	-0.057***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Firm Size	0.009	0.010	0.001	0.002	0.014*	0.015*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)
Division Size	-0.018	-0.027**	0.003	-0.004	0.024	-0.001
	(0.014)	(0.013)	(0.014)	(0.015)	(0.041)	(0.036)
Plant Size	3.610***	3.499***	2.637***	2.515***	4.174***	4.093***
	(0.570)	(0.564)	(0.531)	(0.522)	(0.669)	(0.663)
Rounded N	2,000,000	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
R-squared	0.037	0.038	0.024	0.024	0.021	0.021
State, Year and Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Appendix E

This appendix presents results with county-level geographic controls.

Table E.I: Multivariate Analysis of Wages - Geography defined at the County Level

This table shows the relation between own wages and the wages of other workers in a firm. The main difference between the estimates in this table and those in the main text is that, here, County is used instead of State as the level of geography for the controls in the regression. The table contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot \textit{Log(Firm Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *County* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus the Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Column 2, the regressions includes only diversified firms and, as such, the control variable *Divdummy* is absorbed. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(Wage/hour)	
	(1)	(2)
Log(Firm Wage)	0.067***	0.153***
	(0.003)	(0.005)
log(VA/hour)	0.249***	0.177***
	(0.002)	(0.003)
Divdummy	-0.209***	
	(0.010)	
1-HHI Employees	0.089***	0.094***
	(0.007)	(0.007)
Age	0.007***	0.008***
	(0.000)	(0.000)
Firm Size	0.008***	0.007***
	(0.001)	(0.001)
Division Size	0.002	0.002
	(0.004)	(0.004)
Plant Size	0.505***	0.480***
	(0.051)	(0.050)
Rounded N	2,000,000	900,000
R-squared	0.728	0.771
County × Year × Industry FE	Yes	Yes

Table E.II: Impact of Internal Labor Markets on Investment Decisions - Geography defined at the County Level

This table estimates the impact of wage convergence on the investment behavior of firms. The main difference between the estimates in this table and those in the main text is that, here, County is used instead of State as the level of geography for the controls in the regression. The table contains the coefficient from estimating OLS regressions of the type:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot \mathit{Log(Firm\ Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, *County* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Columns 1 and 2, the estimates are on the full sample, while in Columns 3 and 4, the estimation is performed on low-investment divisions (those with investment below the median), and Columns 5 and 6 contain only high-investment divisions (those with investment above the median). Finally, in Columns 1, 3, and 5, the variables *Log(Firm wage)* and *Divdummy* are excluded from the estimation. The standard errors in parentheses are clustered by firm. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	CAPX/Sales					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Firm Wage)		0.286***		0.219***		0.373***
		(0.031)		(0.034)		(0.046)
Divdummy		-0.801***		-0.590***		-1.081***
		(0.103)		(0.113)		(0.154)
1-HHI Employees	0.039	-0.095	0.236***	0.113	-0.179***	-0.323***
	(0.040)	(0.069)	(0.043)	(0.071)	(0.059)	(0.104)
Age	-0.056***	-0.057***	-0.053***	-0.054***	-0.059***	-0.060***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Firm Size	0.012**	0.013**	0.002	0.003	0.019**	0.020**
	(0.006)	(0.006)	(0.006)	(0.006)	(0.008)	(0.008)
Division Size	-0.021	-0.029**	0.003	-0.003	0.017	-0.009
	(0.014)	(0.014)	(0.017)	(0.018)	(0.040)	(0.036)
Plant Size	3.600***	3.490***	2.705***	2.592***	4.157***	4.076***
	(0.598)	(0.593)	(0.598)	(0.590)	(0.669)	(0.663)
Rounded N	2,000,000	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
R-squared	0.199	0.199	0.218	0.218	0.167	0.167
County × Year × Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Appendix F

This appendix presents results with standard errors clustered at the plant level.

Table F.I: Multivariate Analysis of Wages - Plant level clustering

This table shows the relation between own wages and the wages of other workers in the firm. The main difference between the estimates in this table and those in the main text is that, here, standard errors are clustered by plant. The table contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *County* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus the Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Column 2, the regression includes only diversified firms and, as such, the control variable *Divdummy* is absorbed. The standard errors in parentheses are clustered by plant. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(Wage/hour)	
	(1)	(2)
Log(Firm Wage)	0.064***	0.144***
	(0.001)	(0.002)
log(VA/hour)	0.242***	0.170***
	(0.001)	(0.001)
Divdummy	-0.195***	
	(0.005)	
HHI Employees	0.093***	0.101***
	(0.003)	(0.003)
Age	0.007***	0.007***
	(0.000)	(0.000)
Firm Size	0.008***	0.008***
	(0.000)	(0.000)
Division Size	0.001	0.001
	(0.001)	(0.001)
Plant Size	0.510***	0.488***
	(0.035)	(0.034)
Rounded N	2,000,000	900,000
R-squared	0.710	0.739
State × Year × Industry FE	Yes	Yes

Table F.II: Impact of Internal Labor Markets on Investment Decisions - Plant-level clustering

This table estimates the impact of wage convergence on the investment behavior of firms. The main difference between the estimates in this table and those in the main text is that, here, standard errors are clustered by plant. The table contains the coefficient from estimating OLS regressions of the type:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot \mathit{Log(Firm\ Wage)}_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), Divdummy and one minus Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Columns 1 and 2, the estimates are on the full sample, while in Columns 3 and 4, the estimation is performed on low-investment divisions (those with investment below the median), and Columns 5 and 6 contain only high-investment divisions (those with investment above the median). Finally, in Columns 1, 3, and 5, the variables *Log(Firm wage)* and *Divdummy* are excluded from the estimation. The standard errors in parentheses are clustered by plant. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	CAPX/Sales					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Firm Wage)		0.309***		0.249***		0.384***
		(0.020)		(0.024)		(0.033)
Divdummy		-0.883***		-0.696***		-1.120***
		(0.067)		(0.077)		(0.110)
1-HHI Employees	0.010	-0.111***	0.184***	0.077*	-0.185***	-0.322***
	(0.024)	(0.041)	(0.027)	(0.044)	(0.037)	(0.066)
Age	-0.056***	-0.057***	-0.054***	-0.055***	-0.059***	-0.060***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Firm Size	0.010***	0.011***	0.001	0.002	0.016***	0.017***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Division Size	-0.018	-0.027	0.002	-0.004	0.038	0.013
	(0.022)	(0.022)	(0.022)	(0.022)	(0.034)	(0.034)
Plant Size	3.278***	3.165***	2.381***	2.268***	3.845***	3.762***
	(0.334)	(0.329)	(0.312)	(0.308)	(0.440)	(0.435)
Rounded N	2,000,000	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
R-squared	0.119	0.119	0.117	0.117	0.095	0.096
State × Year × Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Appendix G

This appendix presents results with standard errors clustered by year.

Table G.I: Multivariate Analysis of Wages - Clustering by Year

This table shows the relation between own wages and the wages of other workers in the firm. The main difference between the estimates in this table and those in the main text is that, here, standard errors are clustered by year. The table contains the coefficients from estimating the following OLS regression:

$$Log(Wage/hour)_{idft} = \alpha + \beta \cdot Log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes $log(VA/hour)$, *Age*, *Firm Size*, *Division Size*, *Plant Size*, *County* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy*, and one minus the Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Column 2, the regressions includes only diversified firms and, as such, the control variable *Divdummy* is absorbed. The standard errors in parentheses are clustered by year. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	Log(Wage/hour)	
	(1)	(2)
Log(Firm Wage)	0.064***	0.144***
	(0.010)	(0.006)
log(VA/hour)	0.242***	0.170***
	(0.011)	(0.006)
Divdummy	-0.195***	
	(0.028)	
1-HHI Employees	0.093***	0.101***
	(0.006)	(0.004)
Age	0.007***	0.007***
	(0.001)	(0.001)
Firm Size	0.008***	0.008***
	(0.000)	(0.000)
Division Size	0.001	0.001
	(0.002)	(0.001)
Plant Size	0.510***	0.488***
	(0.025)	(0.017)
Rounded N	2,000,000	900,000
R-squared	0.710	0.739
State × Year × Industry FE	Yes	Yes

Table G.II: Impact of Internal Labor Markets on Investment Decisions - Clustering by Year

This table estimates the impact of wage convergence on the investment behavior of firms. The main difference between the estimates in this table and those in the main text is that, here, standard errors are clustered by year. The table contains the coefficient from estimating OLS regressions of the type:

$$CAPX/Sales_{idft} = \alpha + \beta \cdot log(Firm\ Wage)_{dft} + X'_{idft}\gamma + \epsilon_{idft}$$

where the matrix of controls X includes *Age*, *Firm Size*, *Division Size*, *Plant Size*, *State* × *Year* × *Industry* fixed effects (where Industry is defined at the three-digit SIC level), *Divdummy* and one minus Herfindahl Index of Employees at the different divisions of the firm as measures of corporate diversification (where firm divisions are defined at the three-digit SIC level). In Columns 1 and 2, the estimates are on the full sample, while in Columns 3 and 4, the estimation is performed on low-investment divisions (those with investment below the median), and Columns 5 and 6 contain only high-investment divisions (those with investment above the median). Finally, in Columns 1, 3, and 5, the variables *Log(Firm wage)* and *Divdummy* are excluded from the estimation. The standard errors in parentheses are clustered by year. Statistical significance at 1%, 5%, and 10% is marked with ***, **, and *, respectively.

	CAPX/Sales					
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Firm Wage)		0.309***		0.249***		0.384***
		(0.092)		(0.074)		(0.124)
Divdummy		-0.883***		-0.696***		-1.120**
		(0.301)		(0.231)		(0.411)
1-HHI Employees	0.010	-0.111	0.184**	0.077	-0.185	-0.322***
	(0.101)	(0.073)	(0.084)	(0.060)	(0.118)	(0.090)
Age	-0.056***	-0.057***	-0.054***	-0.055***	-0.059***	-0.060***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)
Firm Size	0.010***	0.011***	0.001	0.002	0.016***	0.017***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)
Division Size	-0.018	-0.027	0.002	-0.004	0.038	0.013
	(0.023)	(0.023)	(0.030)	(0.030)	(0.036)	(0.029)
Plant Size	3.278***	3.165***	2.381***	2.268***	3.845***	3.762***
	(0.351)	(0.348)	(0.344)	(0.334)	(0.547)	(0.553)
Rounded N	2,000,000	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
R-squared	0.119	0.119	0.117	0.117	0.095	0.096
State × Year × Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Appendix H

This appendix presents additional results.

Table H.I presents the mean hourly wage of production workers by wage quintile and type of firm. Each column is associated with a type of firm. The first column shows the wages of plants that belong to non-diversified firms. The second column shows the same information for diversified firms only. Each row of Table H.I represents a different wage quintile, where quintile 1 indicates lowest wages and quintile 5 indicates highest wages (these quintiles are defined just like in Table III of the text). Note that the categorization of industries into quintiles is based on the wages of stand-alone firms only. To understand how the firm's presence in high-wage industries relates to the wages in the low-wage segments, I sequentially eliminate all plants from the firms that have at least one establishment in the high-paying quintiles. In Column 3, I exclude from the sample of diversified firms all establishments from firms that have at least one establishment in wage quintile 5. In Column 4, I exclude all plants from firms that have establishments in wage quintiles 4 or 5. The same procedure is applied to the remaining columns, where I sequentially apply more restrictions on firms that are present in the sample. Each element of the table corresponds to the average hourly wage for production workers in the wage quintile and firm associated to that row and column. For example, the average hourly wage of production workers in the manufacturing sector that operate in an industry classified as wage quintile 2, in a firm that, although diversified, has no plant in wage quintile 5 is $10.83 (Row 2 and Column 3).

This table reveals two main patterns. First, when looking simply at wages in non-diversified firms relative to wages in diversified firms (Column 2 vs Column 3 of the table), we observe that the latter are significantly higher. This is similar to the results reported in Schoar (2002). Second, and more salient to the message of the paper, there is a positive relationship between the wages of workers in a given plant and the wages of workers in the other plants of the diversified firm. In other words, workers in a diversified firm obtain a larger wage when that firm also has higher paid workers. Columns 3 through 6 reveal a striking pattern. It appears that it is not simply corporate diversification that is associated with higher wages but diversification into high paying sectors that leads to higher wages for the entire firm.

Table H.I: Hourly Wage depending on which sectors the firm is present in

This table shows the average hourly wage for production workers in the manufacturing sector. Each row of the table is associated with a wage quintile. The wage quintiles are constructed by categorizing three-digit SIC industries based on the wages of workers in stand-alone firms, where quintile 1 represents the lowest-wage industries and quintile 5 the highest-wage industries. Once industries are placed in one of the five quintiles, this definition is applied to both diversified and non-diversified firms.
Each column of the table is associated with a type of firm. The first column contains wages for workers of stand-alone firms, while the second column contains wages of workers from diversified firms. In Column 3, the sample includes workers of diversified firms that have no establishment in wage quintile 5. In Column 4, the sample is further restricted to include only workers of diversified firms that are not present in wage quintiles 4 or 5. Column 5 contains workers of diversified firms that have no establishments in wage quintiles 3 to 5. Finally, Column 6 reports the average hourly wage for workers of firms that are diversified within industries of wage quintile 1.

	(1)	(2)	(3)	(4)	(5)	(6)
		Diversified				
Wage Quintile	Stand Alone	All	Not Present in q5	Not Present in q4 or q5	Not Present in q3 to q5	Not Present in q2 to q5
1	7.90	11.69	10.12	9.21	8.90	8.19
2	8.75	11.92	10.83	9.97	9.54	.
3	10.90	14.21	12.76	11.83	.	.
4	13.33	16.69	13.89	.	.	.
5	15.21	20.57	.	.	.	.
Total	12.58	16.62	12.77	10.71	9.43	8.19

Figure H.I: The Evolution of Manufacturing Employment in the United States

This figure plots the evolution of manufacturing employment in the United States between 1975 and 2005. The data is obtained from the Federal Reserve Economic Data (FRED) at the St. Louis Fed. The data corresponds to the monthly series of all employees in manufacturing (in thousands), seasonally adjusted (variable MANEMP).