Cross-Border M&A Activity and Wage Dynamics[*]

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Abstract

Using detailed administrative data linking French firms and workers over the years 2002-2007, we document a distinct U-shaped pattern in worker-level wages surrounding the time their employer is acquired by a foreign firm, with an estimated 7.5 percent decline in wages observed in years just before foreign acquisition, and approximately 12.5 percent increases in wages in the years afterwards. Changes in workers earnings are evident in both wages and in-kind payments given to workers. We present a model with fair wage considerations among workers and endogenous cross-border acquisition activity that predicts the U-shaped pattern in wages, and characterizes the selection of domestic targets for acquisition by a foreign multinational enterprise. Moreover, we use the model to theoretically ground the conditional mean independence assumption that underlies commonly applied empirical techniques.

Keywords: Cross-Border M&A, wage premium, in-kind payments, fair wages

JEL Classificaitons: F66, F14, F23

1 Introduction

The dominant mode by which multinational enterprises enter foreign economies is by cross-border merger and acquisition (M&A).[1] Once they have entered a foreign nation, multinational enterprises account for a large share of total domestic employment activity. For example, in France in 2007, MNEs account for upwards of 28% of total hours worked and total manufacturing employment. Slaughter (2009) reports similarly large volumes of labor usage by MNEs within the US. As a result, cross-border M&A activity can have important and wide-reaching implications for domestic labor market outcomes.

In this paper we examine the wage dynamics of workers employed at domestic firms that are targets of cross-border acquisition. Our analysis investigates both pre- and post-acquisition changes in worker-level earnings, and shows that wages exhibit a distinct U-shaped pattern surrounding the incidence of cross-border M&A activity. We find similar patterns in other compensation using unique information about benefits in-kind given to workers, which include various forms of non-monetary remuneration. The estimated U-shaped pattern in earnings dynamics is substantial in magnitude and robust to a variety of empirical specifications that account for both firm characteristics and workforce composition.

To guide our empirical approach, the first component of our analysis introduces a model of cross-border acquisition activity with endogenous wage differences among workers employed at heterogeneous firms. The model integrates the fair wage mechanism of Akerlof & Yellen (1990) into the model of cross-border M&A activity from Blonigen et al. (2014). When deciding how much effort to put forth, workers consider the wages offered by their employer relative to the overall performance of the firm. To maximize effort of the workforce firms optimally pay a wage commensurate with their profitability. Consistent with our approach, Budd et al. (2005) provide evidence that rent-sharing among workers reflects the total global earnings of a multinational employer. Hence, a foreign acquirer may have to pay higher wages than a domestic firm to induce effort. As discussed in Egger & Kreickemeier (2009,

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[1]See for example Nocke & Yeaple (2007), Head & Ries (2008), and UNCTAD (2000).

2013), the fair wage mechanism generates rent-sharing with workers, and thus captures their incentives to sort into employment at globally oriented firms.

To characterize the selection of domestic firms as targets of acquisition, we model endogenous cross-border M&A activity following Blonigen et al. (2014). Domestic firm performance fluctuates over time due to persistent productivity shocks, and upon realization of these shocks firms may choose to sell their assets to foreign firms via cross-border M&A. Once the acquisition takes place, a foreign acquirer can substitute its technology for that of the domestic target firm, after paying a fixed integration cost. We show firms that possess productive assets but realize negative productivity shocks, are more likely to receive successful takeover bids at any point in time. Intuitively, when target firm productivity suffers, a larger share of potential acquirers can profitably substitute their own technology and make relatively better use of the target's assets.

Considering the fair wage constraint of workers that links remuneration to firm performance, the dip in productivity that precipitates acquisition also leads to a coincident dip in worker-level earnings. Then, upon acquisition, a foreign parent firm integrates its own technology and provides the target with greater access to global markets. This increase in global firm performance raises workers' consideration of fair wages, which firms pay to induce optimal effort. Thus, the model predicts lower relative wages for workers in periods before their employer is acquired by a foreign multinational enterprise, and higher wages in the periods after foreign acquisition takes place.

The second component of our analysis exploits detailed administrative data linking French workers and firms over time to estimate changes in worker-level earnings as their employer transitions to being part of an MNE via cross-border acquisition activity. Our starting point is the standard propensity score matching difference-in-difference estimator (PSM DID) that has been used to study wages at multinational firms: e.g., See Heyman et al. (2007), Hijzen et al. (2013), and Huttunen (2007). This approach estimates the average change in wages at firms that undergo foreign acquistion, relative to changes in wages at observationally equiv-

alent domestic firms, as indicated by the propensity score. We contribute to this empirical literature using the model to specify the propensity score, and provide micro-foundations for the conditional mean independence assumption underlying the PSM approach.

We then generalize the PSM DID approach and estimate year-to-year changes in worker-level earnings before and after their employer is targeted for foreign acquisition. This PSM event-study approach is common in the program evaluation literature, and relaxes the assumption that wages are constant within the pre- and post- acquisition periods. Our empirical strategy follows Couch & Placzek (2010) and estimates a differenced average treatment effect on the treated (DATT) for targets of foreign acquisition relative to a set of matched firms indicated by the propensity score.[2]

Our results show that in the two years just prior to acquisition workers experience an estimated 7.5 percent dip in earnings coincident with the drop in their employer's productivity that precipitated foreign takeover. The estimated pre-acquisition earnings dip is significant at high degrees of confidence and robust to a variety of specifications and the inclusion of detailed information about individual worker characteristics. Importantly, we do not find evidence of the same dip in earnings among the control group of non-acquired firms, even though they are observationally equivalent at the time of acquisition. After a domestic firm is taken over by a foreign acquirer we find that wages begin to rise. In the second year after foreign takeover, wages are approximately 12.5 percent higher than observed in the year of acquisition and are much higher than the wage-level observed during the pre-acquisition decline in earnings. The increase in wages persists into the second year after foreign acquisition and beyond, indicating that the estimated gains reflect a persistent increase in earnings.

One may be concerned that changes in the unobserved characteristics of workers at acquired firms may be driving the observed wage dynamics, as the shocks that precipitate acquisition may induce changes in the firm's labor force that are associated with workers' wages. To address this concern, we also estimate specifications that include worker fixed

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[2]The techniques for estimating DATT in matching contexts are developed in Heckman et al. (1997), Heckman et al. (1998), and Dehejia & Wahba (2002), and elsewhere.

effects to compare wage dynamics for workers that remain employed year-to-year at acquired firms to changes in wages for workers who remain employed at control firms year-to-year. While the change in composition of workers appears important, it does not explain the estimated wage dynamics surrounding cross-border M&A activity. Controlling for worker fixed effects, the decline in wages is estimated to be larger in each of the three years preceding acquisition, while the post acquisition increase is estimated to be somewhat smaller in the years following acquisition.

The empirical component of our analysis exploits a panel of French workers and firms, with information about earnings that offers several advantages for our purposes. First, wages are recorded net of employee and employer payroll tax contributions. In this sense, our measurement of wages best captures retained worker earnings rather than firm-level labor costs. Second, we are able to distinguish worker-level wages from total earnings including benefits in-kind. For example, benefits-in-kind can include the private use of a company car, free or subsidized accommodation and preferential loans, allowances for lunch or travel, communication tools such as phones, computers or internet, etc. This feature of the data allows us to explore not only how the level of worker earnings changes as domestic firms become targets for foreign acquisition, but also how the composition of earnings changes. Finally, we are able to merge worker-level information with detailed data about employers. The matched employee-employer panel dataset allows us to examine relative wages paid in the years surrounding foreign acquisition controlling for a rich set of firm characteristics and the composition of the workforce according to both observable and fixed unobservable worker-level characteristics. The time period of our sample, 2002-2007, is also advantageous in that we observe a full oscillation of a merger wave, from flow to ebb and return to flow.

Many studies have demonstrated that average firm-level wages are higher at multinational enterprises. (See Aitken, Harrison & Lipsey (1996), Lipsey & Sjöholm (2004), Budd et al. (2005), and Arnold & Javorcik (2009)). However, much of the evidence that incorporates information about worker characteristics suggests that observed multinational wage premia

may be almost entirely due to the sorting of different workers across firms. For example, Heyman et al. (2007) concludes that foreign ownership does not increase wages of Swedish workers. Similarly, Hijzen et al. (2013) incorporates administrative data from several countries (Brazil, Germany, Indonesia, Portugal, & UK) and finds little evidence that MNEs increase wages to otherwise identical workers. Huttunen (2007) does find some evidence in Finland of a small wage premium ($< 2\%$ - 3%), but only for high skill workers, and not until several years after their employer becomes an MNE. Girma & Gorg (2014) find substantial heterogeneity in MNE wage premiums based on the foreign MNE's country of origin. As an alternative strategy, Martins (2011) examines changes in wages due to labor mobility and finds that they are similar for Portuguese workers that transition from employment at a domestic to a foreign firm, or from one foreign firm to another, suggesting there is a negligible impact of multinational enterprises on worker earnings.

Our analysis differs from theses studies in several ways. First, our focus on wage dynamics for workers as their employer experiences foreign takeover allows us to relax several empirical assumptions that appear inconsistent with the data. In particular, wages for workers at acquired firms do not appear to follow the same path observed among workers at otherwise similar firms, a feature we capture with out approach. Moreover, we contribute to this literature by deriving the propensity score that characterizes the likelihood of foreign acquisition from first principles. In doing so, we theoretically ground the conditional independence assumption that underlies identification when implementing PSM techniques.

In the next section we develop a simple model of cross-border acquisition activity with endogenous wage differences among workers employed at heterogeneous firms. In section 3 we use the model to derive predictions about year-to-year wage changes for workers as their employer enters MNE status. Section 4 characterizes our preferred empirical strategy to estimate wage dynamics of workers. The data sources for both worker and firm characteristics, as well as variable construction, are described in Section 5. The following section presents the results from our preferred empirical specifications, while the final section concludes.

2 Model

Our purpose is to empirically examine year-to-year changes in earnings for domestic workers as their employer is acquired by a foreign multinational enterprise, independent of other worker and firm characteristics. To inform our empirical approach we present a simple model of endogenous cross-border acquisition activity, with endogenous wage differences among similar workers employed at heterogeneous firms. Specifically, the model integrates the fair wage mechanism of Akerlof & Yellen (1990) into the cross-border M&A model in Blonigen et al. (2014). As discussed in Egger & Kreickemeier (2009, 2013), the fair wage mechanism generates rent sharing between firms and workers, and thus captures the incentives of workers to sort into employment at large and highly productive firms at any point in time, while the framework in Blonigen et al. (2014) captures the likelihood of cross-border acquisition activity across time.

We use the theoretical framework (i) to derive from first principles the propensity of domestic firms to be acquired by a foreign multinational, which guides our empirical approach, (ii) to derive predictions about the changes in worker-level earnings prior to their employer being acquired by a foreign multinational, and (iii) to derive predictions about post-acquisition gains in earnings for workers whose employers experience foreign takeover.

2.1 Wages and Firm Heterogeneity

Consumers in the home country are workers who derive utility in each period t by aggregating consumption, $x_t(j)$, of individual varieties, j, according to $X_t = [\int_{j \in J} x_t(j)^{(\epsilon-1)/\epsilon} dj]^{\frac{\epsilon}{\epsilon-1}}$, where $\epsilon > 1$ is the constant elasticity of substitution across varieties. Letting E_t denote the home expenditure (or income) and β the fraction of income spent on X, it follows that demand for each variety is $x_t(j) = \beta(E_t/P_t^X)(p_t(j)/P_t^X)^{-\epsilon}$, where $p_t(j)$ is the price of the individual variety j, and P_t^X is the ideal price index across all varieties, defined as $P_t^X = [\int_{j \in J} p_t(j)^{1-\epsilon} dj]^{1/(1-\epsilon)}$.

Following Akerlof & Yellen (1990), we assume that workers have a preference for fairness and consequently they condition their effort, e_t, on the wage they are paid, ω_t relative to the wage they consider to be fair, $\hat{\omega}_t$. Employers cannot write binding contracts that condition output on effort, and reductions in effort correspond to reductions in the supply of effective units of labor by workers. Total output of a firm depends linearly on its productivity parameter, ϕ_{jt}, drawn from distribution Φ, and the mass $l_t(\phi_{jt})$ of labor that puts forth effort, e_t, so that

$$x_t(\phi_{jt}) = \phi_{jt} \frac{l(\phi_{jt})}{e_t} \ . \tag{1}$$

If firms pay at least the fair wage, workers provide the normal level of effort which is set to unity. However worker effort decreases proportionally as the wage falls below $\hat{\omega}_t$. Formally, we write

$$e_t = \min\left\{\frac{\omega_t}{\hat{\omega}_t}, 1\right\} \ . \tag{2}$$

From (2) it is clear that firms have no incentive to pay more than the fair wage, as workers put forth no more than a unit level of effort. Moreover, firms have no incentive to pay less than the fair wage; with elastic demand ($\epsilon > 1$) revenue decreases more than proportionally with output, and hence firms are incentivized to maximize the output of each employed worker. Thus, firms optimally set wages such that $\omega_t = \hat{\omega}_t$.

As in Egger & Kreickemeier (2013), workers determine fair wages according to (i) the global economic success of the firm in which they are employed and (ii) the available employment opportunities outside their current employer. Specifically, workers determine fair wages according to a weighted average between the global operating profits, $\Pi(\cdot)$, earned by their employer having productivity ϕ_{jt}, and the average wage of all employers within their sector, $\bar{\omega}_t$, with weights governed by the parameter θ:

$$\hat{\omega}_t(\phi_{jt}) = \Pi(\phi_{jt})^\theta \bar{\omega}_t^{1-\theta} \ . \tag{3}$$

The fair wage constraint in (3) is consistent with evidence in Budd et al. (2005) that rent

sharing among workers reflects the global earnings of a multinational employer, rather than just local earnings.

When connecting the wages characterized in (3) to the data, it is important to recognize that the fair wage constraint also nests the possibility that foreign acquirers do not pay a wage premium relative to other firms in the domestic market. As discussed in Egger & Kreickemeier (2013), if $\theta = 0$, then all firms pay identical wages for each efficiency unit of labor. If $\theta > 0$, then employers must pay a wage commensurate with their operating profits worldwide. Another feature to notice is that the fair wage determined by workers, and paid by employer j, can fluctuate year-to-year as shocks to productivity, ϕ_{jt}, lead to variation in operating profits over time.[3]

Given optimal firm behavior to set $\omega_t = \hat{\omega}_t$ and workers' optimal response to supply a full unit of effective labor, $e_t = 1$, operating profits in period t for firm producing variety j that realizes productivity level ϕ_{jt} are given by

$$\Pi(\phi_{jt}) = A \left(\frac{\hat{\omega}_t(\phi_{jt})}{\phi_{jt}} \right)^{1-\epsilon} \quad , \tag{4}$$

where the constant A is a function of aggregate parameters. The expression in (4) captures not only the operating profits of a firm in a given period but also the option a firm retains if it is confronted by a takeover bid from a potential acquirer; a target firm can continue to operate independently rather than be acquired by a foreign multinational. This outside option is important in determining which takeover bids are accepted by target firms on M&A markets, and hence the timing of cross-border acquisition activity.

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[3]The fair wage constraint provides a straightforward mechanism that ties firm-level profitability to worker-level wages, and receives empirical support in a global context in Budd et al. (2005). However, alternative mechanisms also generate a link between wages and firm productivity. For example, Postel-Vinay & Turon (2010) argue that even transitory productivity shocks can give firms a credible threat to terminate the workers' employment, which allows the firm to renegotiate wages downward, thereby generating a persistent wage shock. Similarly, Lise et al. (2016) show how persistent firm-level productivity shocks induce renegotiation of long-term contracts, and thus generate persistent wage dynamics. We adopt the fair wage mechanism for its ease of exposition and the connection between wages and the propensity for domestic firms to undergo foreign acquisition, but note that these more sophisticated mechanisms may also be consistent with our approach.

2.2 Cross-Border M&A Activity

Target firms can sell their productive assets to foreign acquirers on domestic M&A markets. Upon acquisition, a foreign multinational can substitute its technological capabilities for producing its variety a, given by ϕ_{at}, for that of the target domestic firm, ϕ_{jt}, after paying cost I to integrate the new technology. See Arnold & Javorcik (2009) and Guadalupe et al. (2012) for evidence that foreign acquirers invest substantially to improve the production capacities of target firms. In addition to the new technology, there is a potential cost synergy $n \geq 1$ in producing the varieties a and j, so that the merged firm produces n additional units of output given its productivity.[4] Upon acquisition, the multinational enterprise, including the newly acquired domestic target, earns combined profits of

$$S_{a,j}(\phi_{at}, \phi_{jt}) \equiv n^{\epsilon-1}[\Pi_a(\phi_{at}) + \Pi_j(\phi_{at})] \quad . \tag{5}$$

Successful mergers occur between firms for which there is a non-negative surplus generated by acquisition, such that the combined operating profits in (5), net integration costs and the outside option of each firm to remain independent, are non-negative. Specifically, for a given target firm producing variety j that meets a potential foreign acquirer a with probability μ and receives a takeover bid with strike price $Q_{a,j}$, the likelihood it is acquired in period t is given by

$$Y_{jt}(\phi_{jt}) = Pr\Big[S_{a,j} - Q_{a,j} - I - \Pi(\phi_{at}) > Q_{a,j} - \Pi(\phi_{jt}) \Big|\mu, n\Big] . \tag{6}$$

Equation (6) generally describes the probability a domestic firm will undergo acquisition by a foreign firm. Substituting the total profits that would be earned for each foreign parent

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[4]Blonigen et al. (2014) endogenizes the source of synergies during acquisition as the savings in trade costs that arise as merging firms exploit sunk investments in export capacity. Besides the ability to better access foreign markets, other potential sources of synergies may include eased credit constraints within a multinational firm, general returns to scope in producing the two unique varieties, or use of other idle assets for which sunk investments have already been made. The presence of cost synergies is typical of the industrial organization literature on M&A activity and does not play a role in generating the time variation in wages that we study here. We include potential cost synergies to be consistent with previous literature.

from (5), we can determine the set of viable foreign acquirers – i.e., the set of acquirers for which the inequality inside (6) is satisfied. Integrating over the density of all viable parents, we can then calculate the propensity that each domestic firm will undergo acquisition by a foreign multinational in a given period t as a function of its own observable characteristics.

To determine the set of viable foreign acquirers, we first define the productivity of the marginal acquirer $\bar{\phi}(\phi_{jt}, n)$ that is indifferent to acquisition of a target firm with productivity ϕ_{jt}, conditional on n. From (5), note that the surplus from acquisition is strictly increasing in the productivity of the acquirer. Hence, $\bar{\phi}(\phi_{jt}, n)$ uniquely satisfies

$$S_{a,j}(\bar{\phi}, \phi_{jt}) - \Pi_j(\phi_{jt}) - I \equiv \Pi^a(\bar{\phi}) . \tag{7}$$

The set of viable acquirers for a domestic firm with productivity ϕ_{jt} is all foreign multinationals with productivity at least as great as $\bar{\phi}(\phi_{jt}, n)$. Integrating across the set of viable parents, the probability a target firm with productivity ϕ_{jt} it is acquired in period t is

$$Y_{jt}(\phi_{jt}) = \mu \int_{\bar{\phi}(\phi_{jt},n)}^{\infty} d\Phi'(h) . \tag{8}$$

Intuitively, μ captures the probability that a domestic firm meets any potential foreign acquirer on the domestic M&A market, while the integral captures the proportion of foreign acquirers from distribution Φ' that have productivity sufficient to generate a non-negative surplus by acquiring a domestic firm with productivity by ϕ_{jt}.

Together, the expressions in (7) and (8) explicitly characterize the propensity of a firm to be acquired by foreign multinationals at any point in time conditional on its own observable characteristics. From (7), variation in firm-level productivities (summarized by ϕ_{jt}) or available complementary assets between firms (summarized by n) influence the requisite productivity of the marginal acquiring firm ($\bar{\phi}$), and (8) then calculates the likelihood that a domestic target meets a foreign acquirer with productivity at least a great as the marginal acquirer.

3 Wage Dynamics and Cross-Border M&A Activity

As domestic firms face the prospect of foreign acquisition, we are interested in how the wages they pay to workers evolve. Combined with the wages characterized in (3), we can use the properties of (8) to derive predictions about changes in wages of workers who are employed at firms that are acquired by foreign multinational firms. We begin by characterizing the selection of domestic firms into acquisition by a foreign acquirer. As in Blonigen et al. (2014), the realization of productivity shocks to target firms affects the likelihood that they will meet an acquirer that can make a successful takeover bid.

Lemma 1 *All else equal, firms that realize a persistent negative productivity shock in period $t-1$ are more likely to be acquired by a foreign multinational in period t.*

This result follows directly from implicit differentiation of (7) with respect to the target firm's productivity to obtain $\partial\bar{\phi}(\phi_{jt},n)/\partial\phi_{jt}$, and then differentiation of (8) to obtain $\partial Y(\phi_{jt})/\partial\phi_{jt} < 0$.

Figure 1 takes advantage of detailed administrative data from French firms to illustrate systematic changes in firm characteristics as they undergo foreign takeover. Specifically, we plot TFP for firms that are acquired by foreign owners relative to sector and year averages, from three years prior to acquisition through four years after acquisition.[5] The middle line illustrates TFP for the average French firm acquired by a foreign owner, whereas the lines above and below show TFP for the 95th and 5th percentiles, respectively. Figure 1 demonstrates that target firms are, on average, 1.5% above average three years prior to their acquisition. Even the targets of acquisition with the lowest relative productivity levels (say, at the 5th percentile) have greater than average productivity prior to acquisition three years prior to a foreign takeover.

As predicted by lemma 1, Figure 1 shows that prior to acquisition relative detrended TFP among target firms is falling significantly for any initial TFP level – from the 5th to

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[5]The data sources used to estimate firm-level TFP and construct Figure 1 are described in section 5.
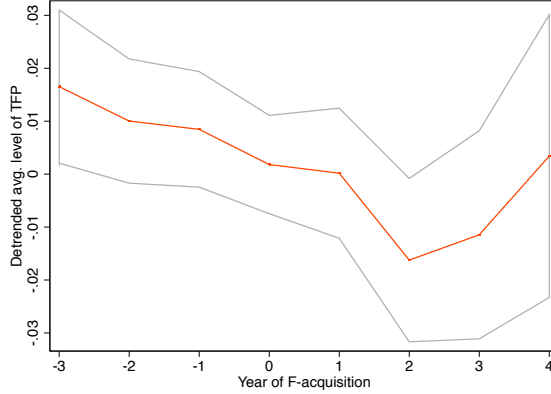
Figure 1: Firm-level productivity prior to and after foreign acquisition
Source: Blonigen et al. (2014)

95th percentile in target firm productivity levels we see significant declines. Hence, Figure 1 provides non-parametric evidence that is consistent with lemma 1 across the entire distribution of firm productivities. (See also Blonigen et al. (2014).) The relative dip in productivity of domestic firms that become MNEs is realized for several years prior to acquisition.[6]

Relevant to our focus here, if workers consider firm performance in determining fair wages (i.e., if $\theta > 0$), then equation (3) indicates workers' earnings also respond to the realization of shocks to productivity and profitability among acquired firms evident in Figure 1.

Lemma 2 *If $\theta > 0$, workers employed at firms that receive negative productivity shocks realize a coincident negative shock to their wages.*

This result follows directly from differentiating equilibrium wages in (3) with respect to firm level productivity ϕ_{jt}. Rent sharing by employers leads to reductions in worker-level wages when firm earnings suffer. Combining lemmas 1 and 2, we obtain the following result:

Proposition 1 *If $\theta > 0$, workers employed at firms that realize wage declines in period $t-1$ are more likely to be acquired by a foreign multinational in period t, all else equal.*

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[6]We note that our results indicate that firm-level productivity and worker-level wages decline several years prior to foreign acquisition, while Fich, Cai & Tran (2011) provides evidence from administrative filings by firms declaring their potential intent to merge that the length of M&A negotiations, from first contact, is approximately 120 days on average, and only 160 days at the upper quartile. Hence, it is highly unlikely that changes in wages two or three years prior to acquisition are related to the negotiation of a takeover by a foreign MNE.

This result describes a pre-acquisition decline in worker-level earnings. Given the pattern in Figure 1 that the entire distribution of acquired firms realizes negative productivity shocks ahead of acquisition, Proposition 1 suggests that nearly all workers employed at firms that are eventually acquired at a foreign multinational realize a decline in earnings.

We are also interested in how earnings change following foreign takeover. Upon acquisition, a foreign parent firm may substitute its productivity for that of the target firm (at cost I), and take advantage of potential synergies between complementary assets. The next result describes changes in wages following a acquisition by an MNE.

Proposition 2 *If integration costs, I, are sufficiently large and $\theta > 0$, then workers employed at firms acquired by a foreign multinational firm in period t realize increases in wages in period $t + 1$, such that $\omega_{t+1} > \omega_{t-1}$. Regardless of the level of integration costs, if $\theta > 0$, then average wages for workers employed at firms that are acquired by a foreign multinational are weakly greater in period $t + 1$ than wages in period t, such that $\omega_{t+1} \geq \omega_t$.*

Proof. Applying the implicit function theorem to (7) shows that the productivity of the marginal acquirer is strictly increasing the level of integration costs: i.e., $\partial \bar{\phi}/\partial I > 0$. Because wages are increasing in firm-level productivity (equation 3), and the expected acquiring firm productivity is increasing in I, there must be a level of integration cost sufficiently large that leads to increases in wages beyond any level observed pre-acquisition. The second part of the result follows from the fact that a domestic target always retains the outside option to remain independent. Hence, post-acquisition profitability $S_{a,j}$, and thus wages, will be at least as great as observed just prior to acquisition. ∎

Proposition 2 predicts benefits for workers whose employers are acquired by a foreign multinational. Furthermore, if the acquiring firm technology (ϕ_{at}) and parent firm performance are relatively high, then Proposition 2 implies worker-level wages following acquisition will fully offset the pre-acquisition declines in workers' wages. Note that Figure 1 plots only information about the acquired targets; following acquisition, the global performance of the firm includes the foreign acquirer. Given the evidence in Nocke & Yeaple (2008) that those

firms who engage in cross-border acquisition activity are large and highly productive, the global performance of the parent firm (not illustrated in Figure 1) is likely to put upward pressure on worker-level wages following acquisition. Finally, it is also worth noting that the apparent dip in estimated TFP in Figure 1 for the year after acquisition is an artifact of the sunk costs I to integrate the capabilities of the parent firm. Further evidence of these costly investments is available in Arnold & Javorcik (2009) and Guadalupe et al. (2012).

The integration cost of cross-border M&A activity, I, is unobserved, as is the parameter θ that governs workers' fair wage considerations. It is then an empirical question whether domestic wages will respond to multinational firms' acquisition activity (depending on $\theta \geq 0$) and if so, how large the potential increase in wages will be (depending on I). The results above predict a decline in wages prior to foreign acquisition, and an increase in wages after foreign acquisition. We turn to the empirical analysis of these predictions immediately below.

4 Empirical Strategy

In this section we describe our empirical strategy to estimate year-to-year wage differences among workers employed at firms that switch from domestic to MNE status via cross-border M&A activity. The simple model above indicates that worker-level earnings depend on firm-level profitability. In our empirical analysis we allow for several characteristics of firm j to influence its profitability and summarize the vector of its characteristics by X_{jt}. The predictions derived above describe wages for each efficiency unit of labor. In the model we also assume that workers are homogeneous, each having the same ability to supply efficiency units of labor. To account for heterogeneity of workers in their ability to produce we introduce a vector of observable characteristics for each worker i given by Z_{it}, and fixed unobservable worker characteristics ψ_i. Consistent with the literature, and the model above, we specify a

(log) linear wage equation with the following form:

$$\ln \omega_{ijst} = \alpha + \sum_{k \neq 0} \delta^k D^k_{ijst} + X_{jt}\Gamma + Z_{it}\beta + \sigma_{st} + \psi_i + \epsilon_{ijst} \tag{9}$$

where ω_{ijst} is the individual net wage – or alternatively earnings that includes net wage and benefits-in-kind – of individual i employed by firm j in sector s during year t. The indicator variables D^k_{ijst} equal unity if year t is the kth year after acquisition by a foreign multinational. (If $k < 0$ then D^k_{ijst} is an indicator for the kth year prior to acquisition.) The term σ_{st} represent sector-by-year fixed effects, which capture *inter alia* the average wage levels in a sector that influence workers' fair wage considerations. Our key parameters of interest are the set of δ^k, which indicate the relative wage differential paid to workers in each year prior to and after acquisition activity. To operationalize (9) during estimation we omit the indicator for the year of acquisition. Hence, the interpretation of δ^k is the difference in worker-level earnings in k^{th} year before or after acquisition relative to the year of acquisition.

A unique feature of our data is that we observe earnings in the form of benefits-in-kind, in addition to individuals' wages. We will also estimate (9) using total worker-level earnings as the dependent variable. The results for total earnings including benefits allow us to examine variation in outcomes that arise as employers alter the composition of remuneration, even if wages are not fully flexible.

The propensity for a domestic firm to be acquired by a foreign multinational parent characterized in equation (8) explicitly highlights the selection problem that plagues estimation of wages via (9). The probability that a worker is employed at a firm that is acquired by a foreign multinational depends on its productivity, ϕ_{jt}. But, the fair wage constraint in (3) indicates that worker-level wages are also a function of ϕ_{jt}, so that the selection of firms into multinational status is tied to characteristics that also impact wages. Ramondo (2009), Arnold & Javorcik (2009), Criscuolo & Martin (2009), and Guadalupe et al. (2012) provide evidence from several countries confirming that high wage and high productivity firms are

more likely to be acquired by foreign firms. However, (8) also offers a potential solution. The probability a firm is acquired by a foreign multinational, conditional on $\bar{\phi}(\phi_{jt}, n)$, depends only on the latent variable μ. Thus, we can exploit wage variation at firms with similar observable characteristics, but different realizations of μ, to identify the impact of cross-border M&A activity on worker-level wages.

We specify a propensity score, $p(X_{jt})$, for each firm using equation (8), which captures the likelihood of acquisition conditional on target firm characteristics. Following Couch & Placzek (2010), we then use the set of matched firms indicated by $p(X_{jt})$ to estimate each parameter δ^k, indicated relative wages over time, according to

$$\delta^k = \mathbf{E}\Bigg\{ \mathbf{E}\Big\{ \ln \omega_{ijsk} \big| \mathbf{D_j} = 1, p(X_{jt}), Z_{it}, \psi_i \Big\} - \mathbf{E}\Big\{ \ln \omega_{ijs0} \big| \mathbf{D_j} = 1, p(X_{jt}), Z_{it}, \psi_i \Big\} - $$
$$\Big[\mathbf{E}\Big\{ \ln \omega_{ijsk} \big| \mathbf{D_j} = 0, p(X_{jt}), Z_{it}, \psi_i \Big\} - \mathbf{E}\Big\{ \ln \omega_{ijs0} \big| \mathbf{D_j} = 0, p(X_{jt}), Z_{it}, \psi_i \Big\} \Big] \bigg| \mathbf{D_j} = 1 \Bigg\}. \quad (10)$$

The estimator in (10) returns a Differenced Average Treatment effect on the Treated (DATT). In this context, the DATT compares the difference between wages in the kth year after acquisition and the year of acquisition, $k = 0$, for a firm that is acquired during the sample period, indicated by $\mathbf{D_j} = 1$, to the difference in wages between year k and year 0 for a non-acquired firm, indicated by $\mathbf{D_j} = 0$, where year zero for a non-acquired firm indicates that year it was matched to a treated firm according to $p(X_{jt})$. The expected difference between the year-to-year difference in wages is estimated for the set of firms that are ever acquired relative to the matched set of firms that are never acquired; i.e., the expected difference in (10) is conditional on $\mathbf{D_j} = 1$.

Identification of average year-to-year differences in wages, δ^k, rests on the standard conditional independence assumption, which requires that the difference in wages in year k between otherwise identical workers employed at otherwise identical firms, employed at acquired firms, ω_k^a, and non-acquired firms, ω_k^{na}, is independent of the likelihood of meeting a viable acquirer. The model above describes the exact conditions under which this as-

sumption is met. From equation (8), the likelihood that a domestic employer is targeted by a foreign acquirer, conditional on its productivity, is simply the random chance that it meets any potential acquirer, μ. In other words, the conditional independence assumption is derived from the first principles, requiring that $\omega_k^a, \omega_k^{na} \perp\!\!\!\perp \mu \mid X_{jt}, Z_{it}, \sigma_{st}, \psi_i$.

The control variables in Z_{it} represent a rich set of observable characteristics of individual workers suggested by previous literature, while ψ_i captures fixed unobserved worker characteristics. Specifically, the vector of worker characteristics Z_{it} includes gender, age (and its squared value) and a dummy indicating the skill level of each worker's occupation. We observe each worker's occupation within a particular job spell, which provides better information about the skill level of employment than a fixed education level of the worker. The length of an individual job spell may also influence wage levels, and so we include a linear trend for each worker that begins in the first year a worker i enters a job within a new employer. Note that specifications including worker fixed effects ψ_i compare earnings among workers who remain employed in acquired firms year-to-year to wages among equivalent workers employed in otherwise identical non-acquired firms year-to-year.

The final step in describing our empirical strategy is to specify the propensity score. Equation (8) indicates that the likelihood that a firm is acquired at any given point in time, conditional on the set of complementary assets n, is determined by its contemporaneous productivity level. For ease of exposition we assumed that the cost synergy realized during acquisition was constant across firms. We generalize this assumption and allow for a broad range of firm characteristics to influence the potential benefits of cross-border acquisition activity; we include indicators for export activity, firm skill intensity, firm capital intensity and firm-level productivity as determinants of the selection into acquisition. We estimate the probability that a firm j with characteristics X_{jt} is acquired in period t using a logit model: $p(X_{jt}) \equiv \Lambda(X_{jt})$. We match firms within sector, year-by-year, and implement the nearest-neighbor matching procedure without replacement. The results from the logit estimation as well as the balancing tests are reported in the appendix.

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5 Data

We build our sample matching three detailed micro-level datasets. The datasets are merged using a unique and time-invariant identifier called SIREN that is attributed by the French statistical office Institut National de la Statistique et des Études Économiques (INSEE) to each firm. Data regarding workers and wages come from the "DADS Panel" – Declaration Annuelle de Donnes Sociales – an employer/employee dataset also collected by the INSEE. As the information in the DADS dataset is used to compute the income tax of workers, the reporting is extremely reliable. The DADS Panel dataset reports earning histories at the establishment level of all declared employees born in October. Thus, it has a panel dimension that allows us to follow workers over time. It has information on the identification number of the establishment which can be easily matched to the SIREN of the firm. The data report information on the number of hours worked, wages, in-kind payments, age, gender, occupation at two digit level, etc. The information in the data allow us to construct an indicator of worker experience as the number of active years on the labor market as well as the individual skill level using the Biscourp & Kramarz (2007) methodology.

The DADS panel dataset is merged with the database *"Liaison Financière élargi"* (LIFI) that has information on the ownership of the parent company of firms located in France.[7] A foreign affiliate is defined as a firm that is located in France for which more than 50% of its shares or voting rights are controlled by a foreign group. Note the median voting share owned upon acquisition is 99%, so that the acquisition event represents a near complete takeover of assets and control for the overwhelming majority of the sample. We also use LIFI to identify the year of a takeover. We define a firm as having undergone a foreign M&A

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[7]The LIFI dataset combines two sources of information. A first survey of "large" firms gives detailed information on the ownership of groups, the link between affiliates (at home and abroad), and information on shareholders. Only firms with more than 500 employees, or having a yearly turnover greater than 20 million euros, or having more than 1.2 million euros of shares in other firms are subject to this survey. The survey is completed with a second database, DIANE, that reports financial linkages between firms. Firms with an annual turnover above one million euros are surveyed. Notice that relatively large firms are surveyed, but they indicate their financial links with all their affiliates (if any) irrespective of their size. Furthermore, the sample of firms that are surveyed (those with more than 500 employees or more than 1 million euros of turnover) represents half of the firms, and account for 94 percent of total value added.

if the group owner in t is foreign, while the group owner in $t-1$ is French.

The data is merged to the Enquête Annuelle d'Entreprise (EAE) annual business survey on firms' income statements and balance sheets. The survey has information on firms with more than 25 employees and is exhaustive above this reporting threshold. It is thus not crucial as the M&A market concern operations on firms of large size. The EAE has information on capital, employment, sector of principle activity, etc. Firm age and skill intensity are computed using information from the DADS panel. In order to compute total factor productivity (TFP), we restrict the data to the manufacturing sectors. We compute firm-level TFP using the Olley & Pakes (1996) method. Accordingly, we control for the simultaneity bias that arises from the endogeneity of a firm's input selection.

After merging the dataset, there are 183,049 worker-year observations observed over the period 2002-2007. The unbalanced panel dataset has information on 4,362 firms. Given the fixed time frame of the sample period and the fact that firms are acquired at different years in the sample period, one may be concerned about potential attrition of observations as we examine periods several years before or several years after acquisition. To mitigate concerns about attrition for outlying years we focus on our analysis on a narrow bandwidth surrounding acquisition. Specifically we focus our analysis of wage dynamics on coefficients δ^k for years $k = -2, -1, 1, 2$ and control for average relative wages in outlying years in all specifications, indicated by $\delta^{\leq -3}$ and $\delta^{\geq 3}$.

Table 1 reports summary statistics for each of the variables used in our empirical analysis, delineating between the aggregate sample, and the treated and control group subsamples used in our PSM approach. Comparing the treated (acquired) and control group we find that firm-level characteristics are quite similar; the results from the PSM specifications and the balancing test confirming the quality of matches in all years is available in the appendix. While average wages among acquired (treated) and matched (control) firms appear similar in Table 1, the question is whether the wage dynamics of workers differ across these employers as some of them are acquired by foreign multinationals.

6 Results

We begin with the results from simple OLS specifications, and the PSM DID specifications that account for the selection of domestic firms for foreign acquisition. Using these results as a baseline, we then relax the assumption that worker-level wages are constant within pre- and post- acquisition periods and estimate year-to-year changes in earnings as workers' employers are acquired by a foreign multinational.

6.1 Baseline OLS Wage Regression

The OLS estimation results using our sample of French workers and firms are reported in Table 2, with standard errors clustered at the firm-level reported in parentheses. Column (1) controls only for sector & year fixed effects, and the point estimate of 0.131 indicates that the wages paid by multinational firms are approximately 13.9 percent higher than observed at non-multinational firms. Much of this observed difference in wages is attributable to the superior characteristics of firms that are acquired by multinational enterprises; as seen in Column (2), when we introduce controls for observable firm-level characteristics we find the wages paid by targets of foreign acquisition are only 4.4 percent higher than those paid by otherwise similar domestic firms. Finally, Column (3) introduces controls for worker-level characteristics to account for differences in the workforces of domestic firms and targets of foreign acquisition, and the apparent difference in wages disappears. The point estimate on the indicator of foreign acquisition in Column (3) is only 0.026 and is insignificant. Columns (4)-(6) and (7)-(9) repeat this exercise allowing for trends in wages based on length of workforce experience among workers and the date firms enter the sample period. Column (10) introduces the preferred specification of sector-by-year fixed effects. The results across Table 2 show no apparent difference in average wages of observationally similar French workers employed by targets of foreign acquisition versus those employed at domestic firms.

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6.2   Propensity Score Matching Difference-in-Differences

Recognizing the selection of firms being acquired by foreign multinationals based on their observable characteristics, Table 3 reports estimates from PSM DID strategies often implemented in the literature studying labor market outcomes at multinational firms. We take care to distinguish selection into multinational status generally and the selection of domestic firms into acquisition by a foreign firm, which is our focus here.

Columns (1)-(4) of Table 3 use wages as the dependent variable, while Columns (5)-(8) incorporate information about in-kind payments to workers. Note that Columns (1) & (2) and the corresponding specifications in Columns (5) & (6) construct the control group of firms using a PSM specification that predicts whether or not a firm is part of a multinational enterprise. However, the model above and prior evidence (e.g., Arnold & Javorcik (2009)) confirm that firms that are targets of foreign acquisition may differ in characteristics from other foreign firms, particularly in years surrounding their takeover by a foreign MNE. Columns (3) & (4), and the corresponding specifications in Columns (7) & (8) that include in-kind payments, estimate differences in wages among acquired firms relative to control firms that are observationally equivalent to acquired firms at the time of foreign takeover. We continue to calculate standard errors clustered at the firm-level to account for potential serial correlation among repeated observations of workers within firms over time.

The results in Table 3 show that the delineation between the matching of firms indicated by propensity scores estimating the likelihood of observing foreign acquisition versus a general foreign status may be important. Wage growth among typical firms that are part of multinational enterprise does not differ from wage growth among similar domestic firms (Columns (1) & (2)). However, wages among workers employed at targets of foreign takeover exhibit approximately 8 to 9 percent increases in earnings after acquisition relative to the respective control group (Column (3)), even after controlling for observable worker characteristics (Column (4)). The same pattern emerges when considering earnings that include in-kind payments.

While Table 3 controls for observable worker characteristics, targets of foreign acquisition may select workers based on unobservable characteristics as well. Table 4 repeats the PSM specification including worker fixed effects that account for fixed unobservable characteristics and finds the typical wages among neither the typical foreign firm, nor targets of foreign acquisition differ on average from wages offered by comparable domestic firms. In each specification, the point estimates are much smaller when worker fixed effects are included, and statistically insignificant at the 5 percent level. While Tables 2 and 4 show that average wages do not differ between employees at targets of acquisition and otherwise similar workers at domestic firms, the average differences in wages can mask differences in wage dynamics as firms experience foreign takeover.

6.3 Propensity Score Matching Event Study Approach: DATT

The model above predicts that domestic firms that experience declines in earnings among their workforce are more likely to later be acquired by foreign multinationals. Upon acquisition, worker-level wages are then predicted to improve as workers' fair wage considerations increase commensurate with the global performance of the acquiring multinational enterprise. Rather than assume that wages are constant within pre- and post- acquisition periods, as imposed in the PSM DID approaches above, in this section we allow wages to differ in each year prior to and after acquisition. This approach allows us to directly analyze wage dynamics for workers whose employers are targeted for acquisition by foreign multinational firms. Note that the DID approach is nested as a specific case of our preferred strategy in (9), which imposes the assumptions that $\delta^k = 0$ for all $k < 0$ and that $\delta^k = \delta^{k'}$ for all $k, k' > 0$. The results from our preferred specifications are reported in Table 5.

To ease exposition, for each specification we report the estimated year-to-year changes among the control (matched) group alongside differenced average treatment effect for treated (DATT), and report the total calculated wage dynamics for years near foreign acquisition in boldface. Robust standard errors are in parentheses, while the p-values from an F-test for

the significance of the wage dynamics are in square brackets.[8] Recall, to operationalize the estimation of (9), we omit the indicator for the year of acquisition so that the coefficients for each year around acquisition, δ^k, reflect wages in year k relative to the year of acquisition. Evidence of lower earnings for workers before their employer is acquired by a foreign multinational corresponds to negative and significant wage levels for any pre-acquisition period.

The results in specification (1) of Table 5 indicate that several years prior to acquisition (≤ -3) wage levels among employees of acquired firms do not differ significantly for earnings observed in the year of foreign takeover. However, two years prior to foreign acquisition workers experience a relative decline in their wages; the estimate for year $t-2$ is -0.078, indicating that worker-level wages two years prior to acquisition are approximately 7.5 percent less than wages observed in the year of acquisition. This estimated decline in earnings is significant at high degrees of confidence (p-value$\leq$0.033) and is consistent with the predictions of the model. The estimated coefficient on the indicator for the year before acquisition, $k = -1$, in specification (1) is 0.022 and is not significant, which implies that wages of workers at acquired firms begin to level out just ahead of foreign takeover.

In the years following acquisition, the evidence shows that the wages of employees of target firms increase. The point estimate in Column (1) for $t+1$ among the acquired group is 0.117, which indicates that wages are approximately 12.5 percent higher in the year following acquisition than observed the year takeover occurred. The post-acquisition increase in wages is significantly different from zero at high degrees of confidence (p-value$\leq$0.000). In the second year after acquisition we find that wages remain significantly different than observed in the year of acquisition; the 0.106 point estimate for year $t+2$ is very similar to the estimate for year $t+1$, indicating that the immediate post-acquisition wage gains persist.

The model above predicts that improvements in the performance of target firms and their global engagement upon acquisition leads to increases in worker-level wages. Evidence

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[8]As in Couch & Placzek (2010), it is often standard to report bootstrapped standard errors for estimates of DATT. Here, we choose to report robust standard errors because they are more conservative than those calculated by bootstrapping.

in Arnold & Javorcik (2009) and Guadalupe et al. (2012) confirms that foreign acquiring firms invest substantially to improve the production technology and export capabilities of their domestic targets. The positive point estimate for the years following acquisition and the statistically significant increase in wages estimated in the years after acquisition are consistent with these predictions and evidence.

Importantly, the same pattern in wages is not evident among the set of control firms in the years surrounding when were matched to acquired firms. As seen in the Control column for specification (1), in no year before or after acquisition do wages for workers within the control group differ significantly from the year their employer was matched to an acquired firm. However, in the years before and after acquisition several the estimates in the DATT column are significant at high degrees of confidence. Moreover, note that the point estimates for the control group are an order of magnitude smaller than those estimated for the acquired group. The significance and magnitudes of the DATT estimates at various years provided direct evidence for the differential pattern of wages over time for workers employed by the two sets of firms, even though those employers appear similar at the time of acquisition.

We are also interested in the year-to-year changes in earnings that include in-kind payments. In specification (2), we estimate changes in total worker earnings using unique information about in-kind payments made to workers, such as the private use of a company car, free or subsidized accommodation and preferential loans, allowances for lunch or travel, communication tools such as phones, computers or internet, etc. We find the same pattern in total earnings as observed for worker-level wages, with total earnings falling in years before an employer is acquired by a foreign multinational firm and sustained increases in total earnings following acquisition.

6.4   Wage Dynamics and Workforce Composition

The model above suggests, and the evidence reported in Table 5 confirms, wages paid to observationally equivalent workers change substantially in the years surrounding the incidence

of foreign takeover. However, the changes in productivity that induce foreign acquisition and worker wage dynamics may also lead to changes in the labor demand of acquired firms. One may be concerned that the firing and hiring of workers as productivity shocks arise and foreign takeover occurs may not be random across workers with different unobservable time-invariant characteristics. To account for this scenario, Table 6 introduces worker fixed effects when estimating the year-to-year changes in wages for workers whose employers experience foreign takeover. With worker fixed effects included, the estimates reflect changes in wages among workers who remain employed at acquired firms year-to-year, compared to workers who remain employed at otherwise similar firms, as indicated by the propensity score. Thus, these specifications exploit variation in wage growth within workers over time. We continue to report robust standard errors in parentheses and p-values for the F-tests on the total estimated wage dynamics in brackets.

Even after accounting for fixed unobserved worker characteristics, Table 6 shows the same pattern in wage dynamics surrounding the timing of cross-border acquisition. Wages decline in the years ahead of acquisition and then increase upon foreign takeover. In fact, the estimates in specification (1) in Table 6 show that the pre-acquisition wage declines are even more severe for the set of workers who remain employed year-to-year compared to the corresponding estimates for wages in each pre-acquisition year reported in Table 5. In particular, the estimated pre-acquisition wage decline two years before foreign takeover is approximately 12.5 percent, rather than the 7.5 percent decline estimated when worker fixed effects are omitted. The estimated differences in wages when worker fixed effects are included are consistent with domestic targets of acquisition terminating employment for workers with relatively lower wage outcomes based on unobservables.

Following acquisition, worker-level wages are relatively higher at acquired firms, but do not continue to increase in the years immediately following acquisition, as shown in bold for years $t+1$ and $t+2$ under specification (1). In other words, the estimated wage gains are relatively smaller when worker fixed effects are included, though still significantly above the

wage levels observed in the years before acquisition. In sum, while changes in the composition of workers based on unobservables surrounding the incidence of foreign acquisition appear to be important in explaining wage levels, changes in composition of a target firm's workforce do not account for the estimated wage dynamics pre- and post-acquisition.

7   Conclusion

Cross-border investment acquisition activity responds to several national and international policies. In fact, the key purpose of many globalization policies is to facilitate incoming investment by foreign multinationals in hopes of benefiting domestic labor market outcomes. The results we have presented here indicate that worker-level wages exhibit economically sizable dynamics in the years before an employer is acquired by a foreign multinational enterprise. Moreover, the evidence here suggests that these wage dynamics may mask important wage changes when making simple comparisons between wages before and after acquisition.

The evidence presented here suggests that the selection of workers into employment at specific firms, and the selection of specific firms as targets for foreign acquisition are important determinants of the apparent wage differences at acquired firms. However, these selection effects do not explain all of the year-to-year wage variation, as important wage dynamics arise even after controlling for a wide variety of observed and unobserved characteristics. While we have focused solely on the earnings of workers at acquired firms, we see fruitful avenues for future study that explore how the type of occupations offered by acquired firms evolves as they face the prospect of foreign takeover, and how the workers that exit targets of foreign acquisition perform in the labor market as compared to workers who face unemployment spells for other types of layoff.

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Table 1: Descriptive Statistics

	Full sample OLS		Full sample PSM		Acquired PSM		Control PSM	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Log(wage)	9.61	0.96	9.63	1.00	9.66	0.96	9.61	1.04
MNE	0.25	0.43	0.33	0.47	0.62	0.48	0	0
TFP	3.97	1.29	4.27	1.23	4.27	1.29	4.26	1.17
Exporter	0.91	0.27	0.94	0.22	0.95	0.20	0.93	0.24
Capital Intensity	4.06	1.65	4.12	1.24	4.09	1.15	4.16	1.33
Skill Intensity	0.46	0.23	0.46	0.22	0.47	0.23	0.44	0.22
Male	0.71	0.45	0.72	0.45	0.72	0.45	0.73	0.44
Unskilled	0.14	0.35	0.14	0.35	0.14	0.35	0.14	0.35
Age	40.11	10.81	40.38	10.82	40.11	10.69	40.69	10.95
Age sq.	1726.4	869.4	1747.8	872.1	1723.5	857.8	1775.8	887.3
Workforce Experience	2.67	1.68	2.76	1.68	2.71	1.65	2.82	1.71
Firm age	3.15	1.72	3.31	1.71	3.22	1.69	3.41	1.73
Observations	183049		43182		23118		20064	
Number of Firms	4362		444		227		217	

Table 2: Differences in Wages Between Domestic Firms and Targets of Cross-Border Acquisition: OLS Specifications

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Foreign	0.131^a	0.043^c	0.026	0.097^a	0.028	0.019	0.111^a	0.040^c	0.025	0.030
	(0.032)	(0.022)	(0.018)	(0.028)	(0.021)	(0.018)	(0.030)	(0.022)	(0.019)	(0.018)
TFP		0.080^a	0.056^a		0.050^a	0.041^a		0.055^a	0.043^a	0.044^a
		(0.011)	(0.008)		(0.010)	(0.007)		(0.011)	(0.008)	(0.008)
Exporter		0.107^a	0.077^a		0.075^b	0.064^b		0.089^b	0.072^a	0.070^a
		(0.033)	(0.023)		(0.035)	(0.023)		(0.033)	(0.023)	(0.023)
Capital Intensity		0.031	0.019^c		0.038^b	0.024^b		0.037^b	0.024^b	0.021^b
		(0.018)	(0.010)		(0.016)	(0.009)		(0.016)	(0.010)	(0.009)
Skill Intensity		0.299^a	0.240^a		0.335^a	0.263^a		0.339^a	0.264^a	0.263^a
		(0.058)	(0.052)		(0.054)	(0.050)		(0.053)	(0.049)	(0.048)
Male			0.236^a			0.223^a			0.222^a	0.221^a
			(0.011)			(0.010)			(0.010)	(0.010)
Unskilled			-0.357^a			-0.343^a			-0.344^a	-0.342^a
			(0.015)			(0.015)			(0.015)	(0.014)
Age			0.192^a			0.171^a			0.169^a	0.168^a
			(0.004)			(0.005)			(0.005)	(0.005)
Age^2			-0.002^a			-0.002^a			-0.002^a	-0.002^a
			(0.000)			(0.000)			(0.000)	(0.000)
Workforce Experience				0.237^a	0.233^a	0.136^a	0.261^a	0.257^a	0.151^a	0.155^a
				(0.009)	(0.009)	(0.007)	(0.011)	(0.011)	(0.009)	(0.008)
Firm Age							-0.093^a	-0.102^a	-0.055^a	-0.058^a
							(0.011)	(0.014)	(0.010)	(0.009)
Observations	183,049	183,049	183,049	183,049	183,049	183,049	183,049	183,049	183,049	183,049
R^2	0.016	0.038	0.247	0.107	0.124	0.274	0.113	0.131	0.276	0.279
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Sector x Year	No	No	No	No	No	No	No	No	No	Yes

Dependent variable $\ln \omega_{ijst}$, is the the individual net wage of individual i employed by firm j in sector s during year t. Standard errors clustered at the firm-level are in parentheses. ^{a}, ^{b}, ^{c} denote significantly different from 0 at 1%, 5% and 10% level, respectively.

Table 3: Differences in Wages Between Domestic Firms and Targets of Cross-Border Acquisition: Propensity Score Diff-in-Diff Specificaitons

	Worker-Level Wages				Wages + In-Kind Payments			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign	0.047	0.026	0.083^b	0.087^b	0.047	0.027	0.084^b	0.088^b
	(0.034)	(0.026)	(0.040)	(0.039)	(0.034)	(0.026)	(0.040)	(0.039)
Male		0.203^a		0.206^a		0.204^a		0.207^a
		(0.015)		(0.026)		(0.015)		(0.026)
Unskilled		-0.368^a		-0.380^a		-0.370^a		-0.381^a
		(0.020)		(0.048)		(0.020)		(0.048)
Age		0.169^a		0.175^a		0.169^a		0.175^a
		(0.005)		(0.008)		(0.005)		(0.008)
Age^2		-0.002^a		-0.002^a		-0.002^a		-0.002^a
		(0.000)		(0.000)		(0.000)		(0.000)
Workforce Experience	0.248^a	0.142^a	0.290^a	0.163^a	0.248^a	0.142^a	0.290^a	0.162^a
	(0.012)	(0.010)	(0.015)	(0.012)	(0.012)	(0.010)	(0.015)	(0.012)
Firm Age	-0.080^a	-0.051^a	-0.167^a	-0.115^a	-0.080^a	-0.051^a	-0.167^a	-0.115^a
	(0.012)	(0.012)	(0.033)	(0.026)	(0.012)	(0.012)	(0.033)	(0.026)
First Stage PSM	Foreign	Foreign	Acquisition	Acquisition	Foreign	Foreign	Acquisition	Acquisition
Observations	101882	101882	43184	43184	101882	101882	43184	43184
R^2	0.122	0.257	0.145	0.281	0.122	0.257	0.145	0.281
Sector x Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Dependent variable $\ln \omega_{ijst}$, is the the individual net wage of individual i employed by firm j in sector s during year t. Standard errors clustered at the firm-level are in parentheses. a, b, c denote significantly different from 0 at 1%, 5% and 10% level, respectively.

Table 4: Differences in Wages Between Domestic Firms and Targets of Cross-Border Acquisition: Propensity Score Diff-in-Diff Specificaitons with Worker Fixed Effects

	Worker-Level Wages				Wages + In-Kind Payments			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Foreign	0.004	0.003	0.042^c	0.037	0.003	0.002	0.042^c	0.037
	(0.029)	(0.029)	(0.023)	(0.023)	(0.029)	(0.029)	(0.023)	(0.023)
Unskilled		-0.021		-0.040		-0.021		-0.040
		(0.021)		(0.028)		(0.021)		(0.028)
Age		-0.145^a		-0.149^a		-0.145^a		-0.149^a
		(0.011)		(0.022)		(0.011)		(0.022)
Age^2		-0.002^a		-0.002^a		-0.002^a		-0.002^a
		(0.000)		(0.000)		(0.000)		(0.000)
Firm Age	-0.026	-0.021	-0.180	-0.125	-0.026	-0.021	-0.180	-0.125
	(0.028)	(0.028)	(0.130)	(0.134)	(0.028)	(0.028)	(0.130)	(0.134)
First Stage PSM	Foreign	Foreign	Acquisition	Acquisition	Foreign	Foreign	Acquisition	Acquisition
Observations	76154	76154	37603	37603	76154	76154	37603	37603
R^2	0.737	0.737	0.731	0.756	0.738	0.751	0.752	0.757
Sector x Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Worker FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Dependent variable ln ω_{ijst}, is the the individual net wage of individual i employed by firm j in sector s during year t. Standard errors clustered at the firm-level are in parentheses. ^{a}, ^{b}, ^{c} denote significantly different from 0 at 1%, 5% and 10% level, respectively.

Table 5: Worker-Level Wages Surrounding Cross-Border Acquisition:
PSM Differenced Average Treatment Effects

| | Worker-Level Wages | | | Wages+In-Kind Pmts | | |
| | (1) | | | (2) | | |
	Control	DATT	**Acquired**	Control	DATT	**Acquired**
$t \geq 3$	-0.016	0.161^a	**0.145*****	-0.016	0.162^a	**0.146*****
	(0.020)	(0.019)	**[0.000]**	(0.020)	(0.019)	**[0.000]**
$t+2$	-0.022	0.128^a	**0.106*****	-0.022	0.128^a	**0.106*****
	(0.023)	(0.019)	**[0.002]**	(0.023)	(0.019)	**[0.002]**
$t+1$	0.020	0.097^a	**0.117*****	0.019	0.97^a	**0.116*****
	(0.020)	(0.016)	**[0.000]**	(0.016)	(0.020)	**[0.000]**
0	−	−		−	−	
$t-1$	-0.002	0.024	**0.022**	-0.002	0.025	**0.023**
	(0.019)	(0.018)	**[0.458]**	(0.019)	(0.018)	**[0.459]**
$t-2$	-0.014	-0.064^a	**-0.078****	-0.014	-0.064^a	**-0.078****
	(0.025)	(0.023)	**[0.033]**	(0.025)	(0.023)	**[0.033]**
$t \leq 3$	0.024	-0.070^a	**-0.046**	0.023	-0.070^a	**-0.047**
	(0.018)	(0.021)	**[0.155]**	(0.018)	(0.021)	**[0.148]**
Male	0.249^a			0.250^a		
	(0.010)			(0.010)		
Unskilled	-0.367^a			-0.368^a		
	(0.012)			(0.012)		
Age	0.177^a			0.177^a		
	(0.004)			(0.004)		
Age^2	-0.002^a			-0.002^a		
	(0.000)			(0.000)		
Workforce Experience	-0.122^a			-0.122^a		
	(0.009)			(0.009)		
Firm Age	0.158^a			0.158^a		
	(0.005)			(0.005)		
Observations	43,182			43,182		
R^2	0.261			0.261		
Sector×Year FE	Yes			Yes		

Dependent variable $\ln \omega_{ijst}$, is the net wage of individual i employed by firm j in sector s during year t. PSM *DATT* estimates with robust standard errors. Standard errors are in parentheses. ^{a}, ^{b}, ^{c} significantly different from 0 at 1%, 5% and 10% level, respectively. For each specification we report the estimated year-to-year changes among the control (matched) group alongside differenced average treatment effect for treated (DATT), and report the total calculated wage dynamics for years near foreign acquisition in boldface. *p*-values for F-tests of total effects are in square brackets. ***, **, denote significantly different from 0 at 1% and 5% level, respectively.

Table 6: Worker-Level Wages Surrounding Cross-Border Acquisition:
PSM Differenced Average Treatment Effects Including Worker Fixed Effects

	Worker-Level Wages			Wages+In-Kind Pmts		
		(1)			(2)	
	Control	DATT	**Acquired**	Control	DATT	**Acquired**
$t \geq 3$	0.079^b	0.094^a	**0.173*****	0.080^b	0.094^a	**0.174*****
	(0.034)	(0.032)	**[0.006]**	(0.034)	(0.032)	**[0.000]**
$t+2$	-0.004	0.045^b	**0.041**	-0.003	0.045^b	**0.042**
	(0.024)	(0.021)	**[0.294]**	(0.024)	(0.021)	**[0.289]**
$t+1$	0.003	0.026^b	**0.029**	0.003	0.026^b	**0.029**
	(0.015)	(0.012)	**[0.189]**	(0.015)	(0.012)	**[0.188]**
0	–	–		–	–	
$t-1$	-0.021	-0.051^a	**-0.072*****	-0.020	-0.051^a	**-0.071*****
	(0.016)	(0.014)	**[0.004]**	(0.016)	(0.014)	**[0.004]**
$t-2$	-0.057^b	-0.076^a	**-0.133****	-0.056^b	-0.076^a	**-0.132*****
	(0.025)	(0.023)	**[0.001]**	(0.025)	(0.023)	**[0.002]**
$t \leq 3$	-0.084^b	-0.133^a	**-0.217*****	-0.084^b	-0.134^a	**-0.218*****
	(0.035)	(0.033)	**[0.001]**	(0.035)	(0.033)	**[0.001]**
Male		-			-	
Unskilled		-0.038^c			-0.038^c	
		(0.021)			(0.021)	
Age		-0.127^a			-0.127^a	
		(0.010)			(0.010)	
Age^2		-0.002^a			-0.002^a	
		(0.000)			(0.000)	
Workforce Experience		-			-	
Firm Age		0.027			0.027^a	
		(0.096)			(0.096)	
Observations		37,606			37,606	
R^2		0.754			0.754	
Sector×Year FE		Yes			Yes	
Worker FE		Yes			Yes	

Dependent variable $\ln \omega_{ijst}$, is the net wage of individual i employed by firm j in sector s during year t . PSM *DATT* estimates with robust standard errors. Standard errors are in parentheses. ^{a}, ^{b} , ^{c} significantly different from 0 at 1%, 5% and 10% level, respectively. For each specification we report the estimated year-to-year changes among the control (matched) group alongside differenced average treatment effect for treated (DATT), and report the total calculated wage dynamics for years near foreign acquisition in boldface. p-values for F-tests of total effects are in square brackets. ***, **, denote significantly different from 0 at 1% and 5% level, respectively.