Is There a Dark Side to Mergers and Acquisitions? Evidence from Local Labor Market Spillovers

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Abstract

This paper examines local labor spillover effects of mergers and acquisitions (M&As). By focusing on M&As in the manufacturing sector, I find that, in the metropolitan statistical area (MSA) where target firms reside, the negative effect of M&As on employment growth spills over from the manufacturing sector to the non-tradable sector. Further tests with household-level data confirm this finding. The spillover effects are stronger when an M&A transaction is horizontal, when an MSA relies more heavily on the manufacturing sector, and when firms in the non-tradable sector are smaller. Finally, lax minimum wage requirements may absorb the negative pressure on non-tradable sector employment growth.

Keywords: Mergers and Acquisitions, Non-tradable Sector Employment Change, Spillovers

JEL Classification: G34, J23

1. Introduction

On December 11, 2005, DuPont announced its merger with Dow to form DowDupont. Eighteen days later, Dupont initiated a lay off of 28% of its local workforce at the headquarter. According to a news article, *"... DuPont's layoffs are expected to take a toll on local restaurants, grocery stores, retailers and home sales as families impacted by the job cuts curtail spending or leave the area entirely..."*[1]. This example indicates that while M&As may improve corporate efficiency through workforce restructuring, they may have far-reaching implications on other economically related firms in the local area. Although prior literature has extensively studied the effect of M&As on the labor force of target firm[2], there has been little research on the potential externality of M&As on the local labor market. In this paper, I investigate the spillover effect of M&As on the local labor markets around the target firms.[3]

Specifically, I examine how M&As in the manufacturing sector affect employment growth in the local non-tradable sector. This approach can be justified for several reasons. First, although its employment has decreased for decades, the U.S. manufacturing sector got fresh public attention in recent years for its potential influence on U.S. society. For example, as recent studies show, the loss of manufacturing jobs contributed to the polarization of U.S. politics (Jensen et al., 2017; Freund and Sidhu, 2017; Autor et al., 2016; Che et al., 2016). Second, the manufacturing sector usually relies on national or even global demand. Therefore, M&As in the manufacturing sector are less likely to be driven by local economic shocks, which may also affect employment growth in the local area.

Third, since there is a general decline in the U.S. manufacturing industry, M&As in the sector are often driven by the purpose of cost savings. The post-merger effects measured are, therefore, less likely to be confounded by M&As with different intentions. Fourth, the manufacturing sector is labor-intensive, and the labor force restructuring is usually a key method

[1]For more details, see "Depressing" Atmosphere Envelops DuPont as Layoffs Begin, The News Journal, January 4, 2016

[2]See Li (2012); John et al. (2015); Ma et al. (2016); Lagaras (2018)

[3]Henceforth, I refer to the local labor market around the target firms as the local labor market.

of cost reduction for merging firms after completion. Therefore, M&As in the manufacturing sector often result in post-merger downsizing, which is the source of the spillover effects I analyze. [4] Finally, I analyze employment growth in the non-tradable sector since it depends on local demand, so the employment change I measure is less likely to be confounded by aggregate shocks to income or demand (See Moretti, 2010; Mian and Sufi, 2014; Giroud and Mueller, 2017, etc.).

To illustrate how M&As in the manufacturing sector may affect employment growth in the local non-tradable sector, I first present a simple theoretical model. The model indicates that a merger could reduce aggregate employment in the manufacturing sector and, hence, reduce total labor income. The declined labor income results in lower consumer demand and drives local producers in the non-tradable sector to cut production and labor inputs. In this way, the employment shock in the manufacturing sector spills over to the non-tradable sector.

Before testing the empirical implications of the model, I use National Establishment Time Series (NETS) data to show the effect of M&As on employment change at the firm establishment level. Using a difference-in-differences test, I first find that establishments that are M&A targets experienced a 2.5% decline in total employment level, as compared to the matched control sample. This finding is consistent with the previous findings by Li (2013) and Lagaras (2018), who also find that M&As leads to a significant decline in employment at the target firms. Then, I follow Bhattacharyya and Nain (2011) and identify Metropolitan Statistical Areas (MSAs) that experienced a significant jump in merger activities in a specific quarter (henceforce referred to as *M&A Events*). After identifying these *M&A Events*, I use data from the U.S. Census Quarterly Workforce Indicators (QWI) and estimate an MSA-quarter panel regression. I find that, on average, an M&A event is associated with a 1.0% lower three-year employment growth rate in the local manufacturing sector. The magnitude is economically significant compared to the unconditional mean of the manufacturing sector employment growth rate of -2.2%.

[4]Henceforth, I refer to M&As in the manufacturing sector as M&As.

Moreover, lower employment growth is not restricted to the manufacturing sector. Tests with the non-tradable sector show that the employment growth rate in the non-tradable sector is 60 basis points lower after an MSA experienced an M&A event. Combined with the fact that the non-tradable sector is primarily driven by local demand, my finding suggests M&As cause spillover effects on local communities due to lower consumer demand. A simple back of the envelope calculation suggests that one job loss in the manufacturing sector after an M&A event is accompanied by 1.03 potential job loss in the local non-tradable sector.

The baseline finding is robust to a variety of additional tests. To address the concern that other confounding variables may drive the lower growth rate in the non-tradable sector, I repeat the baseline tests with withdrawn M&A deals and "false" completion dates. If industry trends or aggregate economic conditions drive the reduction in employment, then withdrawn M&A events or M&As with completion dates set one year before the actual date should show effects that are similar to completed deals. Consistent with my prediction, both of the two placebo tests fail to replicate the same pattern as in the baseline results. I further test the robustness by excluding sample observations from 2007 to 2010 to address the concern that the baseline results are driven by the Great Recession that leads to both declined consumer demand and increased industry restructuring activity. Results still hold for the refined sample period.

One key identification challenge is the possibility that unobserved local economic shocks could affect the probability of an MSA having an M&A target and local employment growth simultaneously. To address this concern, I construct an instrumental variable (IV) for the probability that an MSA experiences an M&A event. I follow the spirit of the well-known Bartik instrument by interacting the preexisting composition of an MSA's manufacturing sector with aggregate valuation shocks in that sector[5]. Prior literature has shown that firms with lower valuation are more likely to become targets in corporate takeovers (Shleifer and Vishny, 2003; Edmans et al., 2012). Similarly, undervalued industries are more likely to be-

[5] A similar approach has been adopted by Bartik (1991); Blanchard et al. (1992); Autor et al. (2013); Adelino et al. (2017)

come target industries in merger (Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf et al., 2005). When a national shock hits a specific manufacturing industry and reduces the industry valuation, the industry is more likely to become a target industry of M&As. At the same time, some regions are hit harder than others because their preexisting economic structure leaves them more exposed to the shock in industry valuation. Therefore, the identification strategy in this paper hinges on the notion that areas with higher valuation should have a lower probability of experiencing M&A events. To mitigate the concern the local economic shocks may drive the aggregate industry valuation shock (e.g. a disaster in Michigan may cause valuation decrease for auto industry), I *"clean"* the instrument by orthogonalizing it with respect to average local valuation. The results from the IV regression are consistent with the baseline results and confirm that the adverse spillover effects of M&A events on the local non-tradable sector employment.

To provide further evidence on the decline of local consumer demand, I test the effect of M&As on wage growth and workforce migration. An M&A event leads to reduced wage growth for employees in the manufacturing sector. An affected MSA is expected to experience 80 basis points lower three-year growth in average weekly wage. There is also weak evidence on the decline in the non-tradable sector wage growth. Further tests on the effect of M&As on workforce migration show that, while merger completion is associated with lower growth in the labor force, it does not relate to any significant changes in the population growth rate. The findings on wage and migration further confirm the hypothesis that M&As in the manufacturing sector are associated with lower employment growth in the local non-tradable sector through decreased consumer demand.

I further link M&A events with local employment growth using household data from the Survey of Income and Program Participation (SIPP). The granular data at the household level enables me to control individual characteristics and heterogeneity. I find results that are consistent with MSA-level findings. Not only the individuals who work in the manufacturing sector but those who work in the non-tradable sector also suffer from the downsizing caused

by M&As. An individual working in the manufacturing sector(non-tradable sector) before an M&A event is found to be 3.5%(2.9%) more likely to become unemployed in the post-merger period.

Next, I investigate whether the spillover effect of M&A events varies across MSAs, M&A deals, and non-tradable sector firms with different characteristics. First, MSAs that rely heavily on the manufacturing sector are more likely to experience spillover effects on the non-tradable sector employment after completed M&A deals. Second, compared to other mergers, horizontal mergers are associated with a stronger need for and greater flexibility in cost reduction and labor restructuring. Hence, such deals should have a more pronounced impact on the local non-tradable sector employment. Finally, compared with older and larger firms, younger and smaller firms in the non-tradable sector are more susceptible to shocks to local demand(Adelino et al., 2017). So they should be likely to be affected by M&As in the manufacturing sector. Tests on sub-samples with different types of MSAs, M&A deals, and non-tradable sector firms confirm all these conjectures.

As M&As pose externalities on the target firm local labor markets, do different labor protections have differential effects on the spillover? I investigate this by analyzing the role of labor union coverage and minimum wage requirements on M&A spillovers. The tests on the variation of union coverage support the argument that firms with higher union coverage opt to concentrate their layoffs around major corporate events, such as M&As. However, a higher union coverage at the state level does not prevent negative spillovers to the non-tradable sector, whereas tests on states with different minimum wages show that while the lower employment growth in the manufacturing sector is persistent in states with and without minimum wage laws, the slowdown in the non-tradable sector employment growth only occurs in states with minimum wage laws. These results imply that a lax requirement on minimum wage could help the non-tradable sector to absorb the negative demand shock and mitigate the adverse outcomes of merger completion on local consumer demand.

This paper is closely related to the growing literature on employment and merger decisions.

Prior literature has focused on several aspects. First, the labor market provides motives for corporate M&As (Tate and Yang, 2016; Ouimet and Zarutskie, 2016). Second, M&As are associated with changes in post-merger employment level, wage, and the composition of workforce (Ma et al., 2016; Olsson and Tåg, 2017; Lagaras, 2018). Finally, labor restructuring in the form of layoffs is a primary source of synergies and value creation in corporate takeovers (John et al., 2015; Dessaint et al., 2017). This paper contributes to the literature by showing that M&As affect employment at not only the target facilities but also other industries in the local area through the lowered consumer demands.

Besides, the paper adds to the literature that studies local consumer demands change and non-tradable sector employments fluctuation. Moretti (2010) suggests that there is a local multiplier in each new job created. Mian et al. (2013) and Mian and Sufi (2014) show losses in housing net wealth are associated with a drop in household consumption and non-tradable sector employment. Giroud and Mueller (2017) and Giroud and Mueller (2019) explore the firms on employment growth in responses to declines in local consumer demand. This paper contributes to the literature by identifying a decline in the non-tradable sector employment caused by employment fluctuation in other sectors. The findings may also benefit the studies that focus on the decline of the U.S. manufacturing sector, (See Autor et al., 2013; David and Dorn, 2013; Pierce and Schott, 2016, etc.) as it provides evidence on an underlying cost of the decline of the U.S. manufacturing sector.

Lastly, the paper builds a link between corporate events and the welfare of households. Cornaggia et al. (2018) and Butler et al. (2017) study the spillover effect of Initial Public Offerings and find contrary results. Bernstein et al. (2018) study the effect of different bankruptcy approaches on the local economy and find that adverse effects on employment by liquidated establishments. Different from these studies, this paper sheds light on the spillover effects resulting from corporate restructuring. It helps to complete the picture of how corporate events may affect household welfare.

The remainder of the paper proceeds as follows. Section 2 presents a simple model of how

mergers in the manufacturing sector may affect the non-tradable sector employment. Section 3 describes the data and summary statistics. Section 4 presents the effects of M&A events on the local employment growth of target firm MSA. Section 5 explores cross-sectional variation across states with different labor protection, and section 6 concludes.

2. Theoretical Model

In this section, I use a simple model to illustrate how mergers in the manufacturing sector could affect employment in the local non-tradable sector. Consider an MSA with only two sectors: a manufacturing sector and a non-tradable sector. I use capital letters to denote the variables associated with the manufacturing sector and lowercase letters for the variables associated with the non-tradable sector. There are N producers in the manufacturing sector and n producers in the non-tradable sector. As different skill sets are needed in the non-tradable sector and the manufacturing sector, the labor markets for the two sectors are segmented.

I assume that the manufacturing sector has an increasing and convex labor supply curve. Specifically, that the inverse labor supply curve is $W(L) = W_0 + \alpha L^M$, where $M \geq 1$. For simplicity, each producer in the manufacturing sector produces only one product and the product i is traded nationally at a nation-wide fixed price of P_i. Without loss of generality, I assume that the only production input is labor and the production function in the manufacturing sector is given by the function $Q_i = C_i L_i$, where C_i measures the fixed assets used in production. However, the local labor market is oligopsonistic, where producers in the manufacturing sector make employment decisions, knowing that the number of employees they hire has an impact on the market wage. (See Boal et al., 1997, for a literature survey on monopsony in the labor market.) Hence, producer i's profit maximization problem is:

$$\max_{L_i} \Pi_i = (P_i C_i - W(L))L_i, \tag{1}$$

where $L = \sum_{i=1}^{N} L_i$. The first-order condition implies that

$$L_i = \frac{P_i C_i - W(L)}{W'(L)} = \frac{P_i C_i - W_0 - \alpha L^M}{\alpha M L^{M-1}}. \tag{2}$$

Summing the first-order condition all of the N firms, we get:

$$L = \Big[\frac{\sum_i P_i C_i - N W_0}{(N+M)\alpha}\Big]^{\frac{1}{M}}. \tag{3}$$

Proposition 1. *The aggregate employment in the manufacturing sector is positively related to the fixed assets each firm uses in production.*

Proof. After differentiating L with respect to C_i, we get

$$\frac{\partial L}{\partial C_i} = \frac{1}{M}\Big[\frac{P_i}{(N+M)\alpha}\Big]^{\frac{1-M}{M}} > 0. \tag{4}$$

Now consider that there is an M&A deal where firm j is the target. The acquirer of the merger deal then chooses the post-merger allocation of fixed assets to the target C_j'. Then the change in the aggregate employment will be affected the acquirer's decisions on the allocation of production assets.

For example, if the acquirer firm increases investments by allocating more assets in the local area ($C_j' > C_j$), there will be an ex-post increase in aggregate employment. However, if acquirers decide to reallocate the production fixed assets to products other products ($C_j' < C_j$), then the aggregate employment will decrease. Finally, consider the extreme case that the acquirer company decides to reallocate all of the production assets of the target($C_j' = 0$ and number of firms in the local area will be $N-1$), then it can be shown that the total employment, L, decreases if P_j is reasonably large or the convexity of the wage function, M, is large enough. Since $W(L)$ is an increasing function of L, if L decreases, W will decrease. As a result, the total labor income, $I = W \times L$ will decrease.

The change in employment in the manufacturing sector then diffuses to the non-tradable sector through fluctuations in total labor income. Producers in the non-tradable sector compete for local business; hence, I model the non-tradable sector as a Cournot oligopoly. For simplicity, I assume that each unit of labor produces one unit of good in the non-tradable sector. Producers choose production quantity, l_i, and price p is determined by $p = a(I) - b(I)\sum_{i=1}^{n} l_i$, where $a(I) > 0$ and $b(I) > 0$. I assume $a(I)$ is increasing in I and $b(I)$ is decreasing to capture the dependence of the non-tradable sector on local demand. If total labor income in the manufacturing sector decreases, local demand decreases, indicated by a lower $a(I)$ and higher $b(I)$. The inverse labor supply curve for non-tradable sector is $w(l) = w_0 + \beta l^m$, where $m \geq 0$. The Nash equilibrium solution of the Cournot oligopoly is standard. Producer i's profit maximization problem is:

$$\max_{l_i} \pi_i = (p - w(l))l_i. \tag{5}$$

The first-order condition implies that

$$l_i = \frac{a(I) - b(I)\sum_{i=1}^{n} l_i - w(l)}{b(I) + w'(l)}. \tag{6}$$

Summing the first-order condition for all n firms, we get:

$$l = \frac{na(I) - nb(I)l - nw(l)}{b(I) + w'(l)}. \tag{7}$$

Proposition 2. *The aggregate employment in the non-tradable sector is positively related to total income I.*

Proof. Substituting $w(l)$ and $w'(l)$ into equation (7), we get

$$l = \frac{na(I) - nb(I)l - n(w_0 + \beta l^m)}{b(I) + m\beta l^{m-1}}. \tag{8}$$

and re-arranging equation (8) gives us

$$(n+1)b(I)l + (m+n)\beta l^m = na(I) - nw_0. \tag{9}$$

Let $F(l, I) = (n+1)b(I)l + (m+n)\beta l^m - na(I) + nw_0 = 0$. Applying implicit function theorem and solving for $\frac{\partial l}{\partial I}$, we get

$$\frac{\partial l}{\partial I} = -\frac{F_I}{F_l} - \frac{(n+1)b'(I) - na'(I)}{(n+1)b(I) + m(m+n)\beta l^{m-1}} > 0. \tag{10}$$

Total employment in the non-tradable sector is increasing in I, hence, the employment shock spills over from the manufacturing sector to the non-tradable sector. Let me summarize the main predictions of the model. First, mergers in the manufacturing sector affect aggregate employment in the local MSA by changing the number of firms operating after the merger. Second, if the post-merger integration decreases the number of firms in the manufacturing sector in the local area, there will be a drop in local consumer demand due to lower total labor income. In response to the lower consumer demand, firms in the non-tradable sector decrease output and hire fewer labor. Thus, the slowdown in employment growth spills over to the non-tradable sector.

3. Data

3.1. Establishment-Level Data

The establishment level employment data is from Publicly-Listed National Establishment Time-Series (NETS) Database. The NETS data provides time-series information on establishment locations, employments and estimated sales, business lines and economic performance

(job and sales growth, DB Ratings, payment performance), type of establishment (standalone, headquarters, or branch). I obtain the employment information for establishments that were publicly listed at least once between 1990 and 2014. I remove establishments that have fewer than 200 employees as well as establishments that located in Alaska, Hawaii and Puerto Rico.

I identify M&As by discerning when establishments change ownership. For each merger, I follow Li (2013), Ma et al. (2016) andLagaras (2018) to construct a control group based on the following criteria: 1) the establishment operates in the same 4-digit NAICS industry, 2) the establishment did not experience any M&A activities during the same sample period. For each merged establishment, I select up to five control establishments that are closest to the size of the treated establishment before the year of the deal. I then test the employment change 3 years before and 3 years after the merger.

3.2. MSA-Level Data

The MSA-level analysis uses the publicly available data from the U.S. Census QWI, which are derived from the Longitudinal Employer-Household Dynamics program at the Census Bureau and provide employment and wage information based on detailed firm characteristics, such as geography, industry, age, and size. My main analysis focuses on MSA-level data instead of county-level data for two reasons. First, for reasons of confidentiality, the U.S. Census blocks out some of the variables from the publicly available QWI data. This missing variable issue is more severe at the county level than at the MSA level. Second, the local labor market is not constrained at the local counties; the workforce can migrate between counties while MSAs are larger areas and inter-MSA travels are less frequent. I focus on the employment growth in the manufacturing sector (two-digit NAICS code 31-33) and the non-tradable sector, which consists of Retail Trade (two-digit NAICS code 44-45) and Accommodation and Food Services (two-digit NAICS code 72)[6] (see Mian and Sufi, 2014; Adelino et al., 2017; Bernstein et al.,

[6]Mian and Sufi (2014) define non-tradable sector at the four-digit North American industry classification service (NAICS) code level, but the QWI data provides the best coverage at the two-digit NAICS sectoral

2018, etc.) To calculate the employment growth rate, I compare the employment of a sector at quarter t (EMP_t) with the employment level of the same sector at quarter t+12 (EMP_{t+12}). The employment growth rate is defined as $(EMP_{t+12} - EMP_t)/(EMP_t)$. The focus on the three-year employment growth rate is based on the consideration that a change in the labor market is likely to be a long-term effect. The data on population, number of employees, and income per capita come from the Bureau of Economic Analysis and are available at the MSA-year level dating back to 1969. Finally, I obtain the data on labor force and unemployment rate from the Bureau of Labor Statistics. After merging all the data sources, my final sample contains 26,483 MSA-quarter observations from 344 MSAs.

3.3. M&A Data

I obtain the data on M&As from Securities Data Company (SDC). From all the deals between 1990 and 2016 with target firms belonging to the manufacturing sector, I exclude leveraged buyouts, spinoffs, recapitalizations, self-tender offers, exchange offers, repurchases, partial equity purchases, acquisitions of remaining interest, and privatizations. For each target, I obtain the target zip code from SDC to identify its location. If the zip code of the target is missing in SDC, I collect the address of the target's headquarters from Compustat, whereever available. The transaction value should be at least $50 million in 2010 dollars for a target to be included in the sample.

There are two empirical challenges in defining the influential mergers in local MSA areas. First, theoretically speaking, a merger needs to be substantially large to have a major impact on the local area. Second, for some MSAs there are more than 1 merger in each quarter or consecutive quarters, it is challenging to identify the margin effect of a single M&A deal. To address such issues, I follow the logic of the literature on merger waves and identify significant

level. As argued by Adelino et al. (2017), the definition of non-tradable sector as Retail Trade (two-digit NAICS code 44-45) and Accommodation and Food Services (two-digit NAICS code 72) provides the closest match with this definition.

consolidation M&A events in each MSA in each quarter. Similar approach has been adopted by previous studies such as Bhattacharyya and Nain (2011) and Harford (2005). Specifically, for each MSA the sample, I measure quarterly M&A activity as the total transaction value of all deals announced in a quarter. Then I calculate the time series mean of transaction values in each MSA. I classify an MSA as having experienced an M/A event in a given quarter when the combined transaction value of a quarter is at least two standard deviations higher than the mean transaction value in the local area. This definition ensures that the M&A events measured in the paper are significant consolidation in a local area. It also provides a clean pre-event period during which there was relatively little M&A activity. With such a definition, there are 333 influential mergers in my final sample.[7]

3.4. Household-Level Data

My sample of the household analysis is drawn from the 1995 and 2003 panels of the micro-level SIPP data. The sample does not include the SIPP panels for subsequent years because households' MSA information is no longer available in the SIPP data after 2003. Each SIPP panel tracks 60,000 to 80,000 individuals over a period of up to four years. From the SIPP data, I obtain employment-related information regarding individuals' employment status, occupation, industry, work experience, and income. Additionally, I obtain information on demographics, such as age, sex, race, marital status, household size, and educational attainment. I exclude individuals below the age of 16 or above the age of 70 as they are less likely to be active in the labor market. I also exclude individuals with missing geographic information. As a result, my final sample includes 93,795 individuals.

[7]Tests with alternative definitions of M&A events find statistically and economically similar results.

3.5. Summary Statistics

Table 1 reports the summary statistics. There are a total of 23,108 observations from 344 MSAs[8]. On average, about 5% of the MSA-quarter observations show at least one completed influential merger in the sample. In an average MSA, about 16% of the total employees work in the manufacturing sector and about 23% work in the non-tradable sector. The average weekly wage (in 2010 dollars) for workers in the manufacturing sector is $959.6, while it is only $404.1 for workers in the non-tradable sector.

M&As in the manufacturing sector in the U.S. have been substantial, both in terms of absolute dollar value and the fraction of total mergers. On average, about 20%-25% of the U.S. targets are from the manufacturing sector. Although the proportion of deals in the manufacturing sector has been decreasing since 2010, possibly because of an overall decline in the sector, the average transaction value is still higher than the merger deals in other sectors. Figure 1b shows the dollar value of all deals with targets from the manufacturing sector and the fraction of all deals. On average, deals in the manufacturing sector account for about 30% of all deals in the U.S. Both the absolute dollar amount and the fraction fluctuates in the sample period. It drops in the early 1990s, and then increases from the late 1990s until it reaches the first peak at the beginning of the 21st century. It then drops to its lowest level in 2004 before climbing back up in 2005 and stays at the level till 2010. Both the dollar amount and the fraction of acquisitions in the manufacturing sector decreased in recent years and stayed at a relatively low level after 2010.

Figure 2 shows the geographic distribution of M&As in the manufacturing sector. Figure 2a shows the number of deals in each county from 1990 to 2014, while Figure 2b shows the total transaction value (in 2010 dollars) in each county during the same period. The acquisitions in the manufacturing sector show some geographic pattern in concentration. For example, most of the deals are concentrated in the northeast as well as on the west coast, most likely because

[8]Different states have different starting times on reporting to the QWI data. For example, Massachusetts did not start reporting until 2010.

of the geographic concentration of industries.

4. Effect of M&As on Employment Growth

4.1. Establishment Level Analysis

The first section of the empirical analysis focuses on the effect of M&As on the employment at the target establishments. Following previous studies[9], I estimate the following matched difference-in-differences design:

$$Log(Emp)_{i,t} = \beta_0 + \beta_1 Treated_i \times Post_t + \theta_i + \omega_t + \epsilon_{i,t}, \tag{11}$$

where $Log(Emp)_{i,t}$ is the log employment of establishment i at time t. treated is an indicator that equal 1 if the establishment experienced an M&A. $Post_t$ is the indicator for the periods after the M&A. The interaction between treated and post dummy captures the average treatment effect of the M&A deal. $\theta_{ic]}$ measures the year-fixed effects and ω_i measures the establishment fixed effects. $\epsilon_{i,t}$ is the error term. β_1 is the main coefficient of interest. A negative and statistically significant β_1 implies that M&As have a negative impact on the employment level at the target establishments. Standard errors are clustered at the establishment level.

Panel A of table 2 reports the results. In column (1) and (2), I focus on establishments from all industries. In column (1), the $Treated{*}Post$ term is negative and statistically significant. It indicates that compared to the control establishments, the acquired establishments on average experienced a greater decline in employment level. The coefficient of -0.013 indicates that compared to the control establishments, the treated establishments on average experiences a 1.3% decrease in employment after the merger. In column (2) of table 2, I weight the regression by the number of employees during the year before the merger. The coefficient of the

[9]Existing studies such as Li (2013), Ma et al. (2016), Lagaras (2018), etc. use similar approaches to test the establishment level employment change after M&As

$Treated*Post$ term remains negative and statistically significant. The acquired establishment on average experienced a 2.4% decline in employment level. In Column (3) and (4), I shift the focus to establishments in the manufacturing sector and repeat the test. In both columns, the coefficient of $treated \times post$ indicator is negative and statistically significant. Column 3 (column 4) shows that, compared with the control establishments, the treated establishments are associated with a 1.5%(2.5%) decline in employment after the completion of M&As.

To test the dynamic timing of the employment change after M&A at the establishment level, I modify equation (11) by interacting each time dummy with the treated dummy. Specifically, I estimate the following regression

$$y_{i,j,t} = \beta_0 + \sum_{k=-3}^{k=3} \beta_k Treated \times D[t+k]_{i,j,t} + \theta_i + \omega_t + \epsilon_{i,t} \tag{12}$$

Where $D[t+k]_{i,t}$ are dummy variables for observations that are k years from the acquisition. Panel B of Table 2 reports the estimation results. In all the four columns in panel B, there is no statistically significant difference in employment level before the treated establishments and control establishments before the acquisition. However, after the acquisition become effective, the coefficient on the interactions demonstrate a monotonic change. Figure (3) presents the coefficeint plots of column (2) and (4) in panel B.

4.2. MSA Level Analysis

My analysis on the spillover effect of M&As on the local labor market is based on the comparison between MSAs that experienced M&As at different times. In the baseline analysis, I estimate the following MSA-quarter level panel regression:

$$Employment\ Growth_{i,t} = \beta_0 + \beta_1 M\&AEvent_{i,t} + \beta_2 X_{i,t} + \eta_i + \pi_t + \epsilon_{i,t}, \tag{13}$$

where $Employment\ Growth_{i,t}$ measures the three-year employment growth rate of MSA_i. I focus on the three-year employment growth rate because it takes time for employment changes to take effect after an M&A. $M\&AEvent_{i,t}$ is an indicator that equals one if MSA_i experienced a significant jump in merger activities in the past four quarters[10]. $X_{i,t}$ denotes a vector of time-varying demographic characteristics including four-quarter lagged MSA level employment and four-quarter lagged total income. In the main model specifications, I also control the share of employment in the manufacturing sector at time t-4 as MSAs with varying degrees of dependency on the manufacturing sector might be affected differently by mergers in the manufacturing sector. I include MSA and time fixed effects, which are denoted by η_i and π_t, respectively, to control for MSA-invariant and time-invariant variables.

4.3. Effect on Employment growth in the Manufacturing Sector

table 3 reports the results of the baseline regressions. The dependent variable is the three-year employment growth rate in the manufacturing sector. In column (1), I control for the MSA and year-quarter fixed effects. The coefficient -0.006 indicates that compared with the MSAs without experiencing M&A Event in the past four quarters, an MSA that experienced a significant jump in merger activities in the past 4 quarters is associated with a 2.2% lower three-year employment growth rate in the next three years. This result is economically significant compared to the unconditional mean of -2.0%. In column (2), I control for MSA characteristics by including log (Total income) and log (Total labor force) as control variables, both of which are four-quarter lagged MSA level variables. The coefficient of the Deal dummy remains negative and statistically significant. The coefficient decreases from 0.006 to 0.005 compared to column (1) but the magnitude remains economically large. In column (3), I follow Autor et al. (2013) and control for the share of the manufacturing sector in the previous year to address the possibility that the deal variable could, in part, be picking up an overall declining trend in the U.S. manufacturing sector rather than being caused by a

[10]The results estimated with windows from 1-3 quarters are consistent with the baseline findings.

merger completion. The estimated coefficient indicates that an MSA with one percentage point higher initial manufacturing share experiences a 1.38% lower employment growth rate in the next three years.

Finally, in column (4), I introduce the state × quarter-fixed effect to address the possibility of heterogeneous trends across states. Some states might experience specific transitions in industry composition, so controlling the state × quarter-fixed effects can effectively address the possible effect caused by state time-varying heterogeneity. The coefficient on the Deal dummy remains statistically significant at -0.01, indicating that MSAs with target firms in the past four quarters are associated with a one percentage point lower three-year employment growth in the manufacturing sector.

Taken together, the results from columns (1) to (4) suggest that when a target firm in the manufacturing sector is acquired, it causes a sector-wide employment slowdown in the MSA where the target is located. Lagaras (2018) finds that M&As are associated with a significant decline in employment in target firms through increased layoffs. My findings show that the negative effect on employment growth can spread to the whole sector.

4.4. Effect on Employment Growth in the Non-Tradable Sector

The previous section has established the relation between mergers and acquisitions and the decline in the employment growth rate in the manufacturing sector. In this section, I examine the spill over of the negative effects on employment growth to the non-tradable sector. As illustrated by Mian and Sufi (2014), the non-tradable sector, such as retail and restaurants, depend heavily on local demand. Consequently, a layoff after the completion of an M&A is expected to lower the average wages and consumer demand of the local community.

I follow Mian and Sufi (2014) and Adelino et al. (2017) to define the non-tradable sector as consisting of Retail Trade (two-digit NAICS 44-45) and Accommodation and Food Services (two-digit NAICS 72). I replace the dependent variable in the baseline regressions with the

three-year employment growth rate in the non-tradable sector and repeat the regressions specified in equation (1). table 4 shows the results.

In table 4, columns (1) to (4) repeat the tests as the same column numbers in table 3. In column (1), the model with no control variables indicates that an MSA that has a target firm in the manufacturing sector acquired in the past four quarters is expected to have a 0.3% lower average three-year employment growth rate in the non-tradable sector than MSAs without an M&A Event in the past four quarters. Further, in columns (2) and (3), where I control for MSA characteristics, the economic magnitude of the coefficient on the Deal dummy decreases slightly to 1%; however, this is still economically significant compared to the unconditional sample mean of 4.3%. Finally, to address the issue that different states could have different trends during the sample period, I repeat the same process as in Table 2 and control for state by time-fixed effects. The coefficient on the Deal dummy drops to 60 basis points, indicating that with the completion of a merger, the declined local demand contributes to a 60 basis points lower three-year employment growth in the local area. I adopt column (4) in table 4 as the main model specification in the following tests.

A back-of-the-envelope calculation shows that, for an average MSA, a completed merger is associated with about 290 more job losses in manufacturing sector in the next three years while the declined employment growth is associated with 300 less job creations in the non-tradable sector. Overall, the results in table 4 indicate that there is a "hidden" cost of M&As that is borne by the local community where the target is located. By laying off redundant workforce and improving corporate efficiency, M&As lead to a slower employment growth in the local area, not only for the manufacturing sector where the target belongs, but also for other sectors, such as the non-tradable sector.

4.5. Robustness Analysis

table 5 shows that M&As are associated with slower employment growth in the non-tradable sector. In this section, I first address the concern that the above results might be driven by other confounding factors by employing two placebo tests. First, I change the timing of the completion of M&A deals by replacing the actual completion date with a placebo completion date 12 quarters before the actual date. If acquirers pick up targets from areas with deteriorating conditions in the manufacturing sector or the local economy, then it is the deteriorating economic conditions, rather than the M&A, that causes the findings reported in the previous sections. In this case, the false deal completion dates should show a similarly negative effect on employment growth.

Column (1) of table 5 reports the results with the false completion dates. The dependent variable is the three-year employment growth rate in the non-tradable sector. The coefficient on the Deal dummy is neither statistically nor economically significant, indicating that it is not the economic conditions associated with the local economy that drive the results reported in the previous sections. Rather, it is the M&As that cause a slower employment growth in the MSAs where the target firms are located.

Second, I follow Seru (2014) and Ma et al. (2016) to replace completed deals with withdrawn deals as "placebos." If the Deal variable simply picks up the trend of declining industry or local area conditions, a similar effect should be expected for withdrawn deals. I repeat the baseline regression with withdrawn deals in column (2) of table 5. As seen, the coefficient on the Deal dummy is neither statistically or economically significant. Therefore, the merger deals have to be completed to show the negative effect on employment growth. This suggests that the corporate restructuring resulting from completed M&As trigger the spillover effect to the non-tradable sector.

Third, as Figure 1 shows, a large fraction of the M&As in the manufacturing sector took place around the Financial Crisis. The Crisis could affect local consumer demand by lowering

household net wealth. To address this, I exclude the observations from 2007 to 2010 and repeat the tests. The results on the non-tradable sector employment growth are similar after the completion of the deal. Finally, I follow Autor et al. (2013) and estimate the exposure of local area to Chinese import penetration. The effect of M&A Events remains similar after controling for the potential effect of Chinese import penetration. Overall, the tests in table 5 confirm the findings from the baseline regressions that M&As in manufacturing sector have a negative spillover effect on the local labor market in areas where the target firms are located.

4.6. 2SLS Analysis

The previous sections reveal that completion of mergers in the manufacturing sector has a negative spillover effect on the non-tradable sector employment by lowering local consumer demand. However, the correlation can hardly be interpreted as causal because unobserved economic factors can drive both employment growth in the non-tradable sector and an M&A. To address such an empirical challenge, I construct an instrument to capture the arguably exogenous variation in the probability that an MSA has a M&A target. The literature connecting stock market valuation with the probability of corporate takeover finds that undervalued firms are more likely to be selected as targets in takeovers(Shleifer and Vishny, 2003; Edmans et al., 2012). Similarly, if more firms from the same industry are undervalued, the industry should be more likely to become a target industry. Hence, if an undervalued industry accounts for a large fraction of the local employment, the area might be more appealing for potential acquirers and be more likely to have M&A targets. Overall, this identification strategy hinges on the notion that MSAs with different undervalued industries might have different ex-ante probabilities to have M&A targets.

I identify the exogenous shocks in local valuation in the local area in the following way

$$S_{m,t} = \sum_i \frac{Emp_{i,m}}{Emp_m} Discount_{i,t}, \tag{14}$$

where $Emp_{i,m}$ measures the employment of 4-digit NAICS manufacturing industry i of MSA m when the MSA first enters into the sample. Emp_m measures the total employment of MSA m when the MSA first enters the sample. I measure the local presence using the first available observation of an MSA to mitigate the concern of potential feedback effects from local labor market to stock valuation. I follow Edmans et al. (2012) and use $Discount_{i,t}$ as the valuation measure. $Discount_{i,t}$ measures by how much the firms from industry i are traded to their maximum potential value absent managerial inefficiency and mispricing. [11]

The identification assumption in equation (12) is that while the probability of having a merger target is likely to be endogenously related to local economic conditions, an industry's valuation is more likely to be driven by aggregate economic shocks. Areas with different ex-ante exposure to each industry would experience different changes in local valuations. However, the local valuation measure $S_{i,t}$ is also subject to potential bias. As Edmans et al. (2012) suggests, stock prices are endogenous and increase in anticipation of a takeover. Therefore, if an industry is concentrated in one area, the idiosyncratic shock to the area (housing market crash, disasters etc.) could affect industry valuation.

To address this, I calculate the weighted average discount (market value) for all firms in the same MSA $S^L_{i,t}$. Then, I regress the original measure $S_{i,t}$ on $S^L_{i,t}$ and take the residual term $\tilde{S}_{i,t}$. If $S^L_{i,t}$ captures the common valuation shocks shared by all firms in the local area, $\tilde{S}_{i,t}$ will be orthogonal to the local economic conditions and serve as a valid instrument to the existence of targets in the MSA. I then estimate the following regression

$$M\&A\ Event_{m,t} = \alpha_0 + \alpha_1 \times \tilde{S}_{m,t-1} + \alpha_2 \times X_{m,t} + \epsilon_{m,t}, \tag{15}$$

where α_1 is expected to be negative if areas with industries that have higher valuation are

[11] Specifically, I follow Edmans et al. (2012) to construct the discount measure based on Tobin's Q. The successful firms in an industry are defined as firms that rank on the 80^{th} percentile in their 4-digit NAICS industry. I calculate the discount measure as $(Q^* - Q)/Q^*$. See Edmans et al. (2012) for more details. I then aggregate the discount measure of each industry with the weight of total market cap.

less likely to experience a merger. In the second stage, I estimate the following regression

$$\Delta EMP_{m,t,t+12} = \beta_0 + \beta_1 \times M\&A\ \bar{E}vent_{m,t} + \beta_2 \times X_{m,t} + \epsilon_{m,t}, \tag{16}$$

where $M\&A\ \bar{E}vent_{m,t}$ denotes the predicted probability of an M&A event in the local MSA. Columns (1) and (2) of table 6 report the first stage regression. The local discount instrument is negative and statistically significant on the probability that the MSA will experience an M&A Event. A 1 SD increase in the local discount instrument is associated with a 2.2% lower probability of an M&A Event. Considering that the unconditional mean of the M&A Event is only about 5%, this effect is economically significant as well. The local discount instrument has a strong explanatory power with partial F-statistics of 13.32 and 13.79 in columns 1 and 2, respectively. In columns (3) and (4), I test the effect of merger completion on manufacturing sector employment growth. The reduced form regression in column (3) indicates that a 1 SD increase in the local discount instrument is associated with a 50 basis points increase in the manufacturing sector employment. Additionally, column (4) suggests that a 1 SD increase in the local discount instrument is associated with 70 basis points higher growth rate in the employment of the non-tradable sector.

In the last four columns of table 6, I report the coefficient estimates for the second-stage regression. All coefficients in columns (5) to (7) show negative and significant effects on employment growth rate in the manufacturing and non-tradable sectors, consistent with the ordinary least squares (OLS) results. Including or removing the control variables do not affect the point estimates significantly. However, it is important to notice that the point estimates of the instrumental variable (IV) regression are much higher than the point estimates in the OLS regression. The greater IV effect indicates that takeovers driven by differences in valuation lead to a greater drop in employment growth than average takeovers. This is possible as the acquiring firms could identify undervalued targets and realize the potential value gain through labor restructuring. Alternatively, the IV estimates could capture the marginal effect of a large valuation change. Acquiring firms might only approach a target when the target is

significantly undervalued. I use the OLS result as the preferred model because it shows the average effect of M&As and is more conservative.

4.7. Wage and Migration Effects

In table 7, I analyze the effects of mergers in the manufacturing sector on the MSA's wage growth. I repeat the baseline regressions and replace the dependent variable with the three-year average weekly wage growth rate. In column (1) of table 7, I study the change in wage growth in the manufacturing sector. The Deal dummy is negatively correlated with the three-year wage growth rate with a coefficient of -0.008, indicating that MSAs with completed mergers are expected to experience an 80 basis points lower growth in wage in the manufacturing sector. This finding is consistent with the hypothesis that mergers are associated with a higher probability of layoffs. Lower labor demand in the manufacturing sector might also lead to lower wages. Next, I shift my focus to the wage growth in the non-tradable sector. Column (2) of table 6 shows that the three-year wage growth in the non-tradable sector is statistically significant at 10% with an economic magnitude of 40 basis points. This finding is consistent with that of Mian and Sufi (2014), who find little evidence on wage change in the non-tradable sector despite a decline in the non-tradable sector employment after the Financial Crisis. One possible explanation here is that non-tradable sector could have low wage elasticity.

In columns (3) and (4) of table 7, I explore the effect of M&As on the migration of workforce following a merger completion. According to Autor et al. (2013), a large mobility response indicates that initial local impacts will rapidly diffuse across regions. Following previous studies (Mian and Sufi, 2014), I use two different measures to test labor mobility response after the completion of a merger[12]. In column (3), I test the change in the three-year population growth rate after the completion of a merger. The coefficient on the Deal dummy is negative but statistically insignificant. In column (4), I test the change in the

[12]Since the data on population is only available on an annual basis, the tests in columns (3) and (4) in table 7 are conducted at annual MSA level

three-year labor force growth rate after the completion of a merger. In contrast to the results on population growth, the three-year labor force growth rate is negatively and statistically significantly associated with deal completion, indicating that although there are not many people leaving the MSA, people are quitting the job market because of the weak demand resulting from the merger deal. When combined, the results from columns (3) and (4) in table 7 further confirm the decline in local consumer demand after merger completion.

4.8. Household Level Analysis

The previous sections have established the relation between merger completion and the spillover effects at the MSA level. In this section, I analyze how merger completion affects the local labor market using the household-level data from SIPP. My purpose is to find evidence at the micro level to corroborate the findings at the aggregate MSA level. I estimate the following regression:

$$Outcome_{i,b,t} = \alpha_0 + \alpha_1 \times Treated_i \times Post_{b,t} + \alpha_2 \times Treated_i + \alpha_3 \times Post_{b,t} + \alpha_4 \times X_{b,t} + \alpha_5 \times Y_{i,t} + \eta_b + \omega_t + \theta_i + \epsilon_{i,t}, \quad (17)$$

where $Treated_i$ is an indicator of whether the individual is working in the manufacturing sector (the non-tradable sector) during the year before the merger completion. [13] $Post_{b,t}$ is an indicator if MSA b experienced a completed merger at time (t-3, t). X_b is a vector of the characteristics of MSA b at time t and $Y_{i,t}$ is a vector of individual characteristics of individual i. η_b indicates the time-invariant MSA heterogeneity. ω_t represents the year-fixed effect and θ_i represents the individual-fixed effects. To study the effect of completed mergers on the household, I focus on two outcomes. First, the probability that an individual stays in the manufacturing sector (the non-tradable sector) and second, the probability that the

[13] For MSAs without any completed mergers during the sample period, the treated dummy is defined based on the sector of the individuals' first appearance in the sample.

individual loses his job.

table 8 reports the summary statistics of the household-level data. The individuals in the sample have an average age of about 40 and 53% are married. About 10% of the sample observations work in the manufacturing sector and about 12% work in the non-tradable sector. [14] Overall, about 73% of the individuals in the sample are employed during the sample period. table 8 reports the estimated results.

In panel A of table 9, I test the effect of completion of M&As on individuals working in the manufacturing sector. The treated dummy is defined as one if the individual works in the manufacturing sector during the year before the merger completion. In columns (1) to (3), the dependent variable is the probability that an individual works in the manufacturing factor after the merger completion. In column (1), I do not include control variables; in column (2), I control for all individual characteristics and MSA characteristics;[15] and in column (3), I control MSA$\times$ year-fixed effects to address the potential issue that different MSAs could have different trends in the local labor market. The coefficient on the interaction term treated $\times$ post is negative and statistically significant, indicating that an individual working in the manufacturing sector before the completion of merger is more likely to leave the sector. The estimated coefficient is equal to -0.045 across three model specifications, indicating that after the merger completion, a treated individual is 4.5% less likely to remain in the manufacturing sector. In columns (4) to (6), I test the probability that an individual remains employed after the merger completion. The coefficient estimates in columns (4) to (6) indicate that individuals who worked in the manufacturing sector before the completion of mergers are 3.2% to 3.7% more likely to become unemployed during the three-year period after the merger.

Further, I test the effect of merger completion on workers in the non-tradable sector. The treated dummy in panel B of table 9 is defined as one if an individual was working in the non-

[14] The relative size of employment in the non-tradable and manufacturing sectors for the same period in the QWI data is similar to that of the SIPP data.

[15] The control variables include MSA population, average income, unemployment rate, household size, age, college degree, and whether the individual is married.

tradable sector during the year before the merger. Like the results of panel A, the coefficient on treated×post is negative and statistically significant in all specifications, indicating that individuals working in the non-tradable sector are more likely to leave the sector after merger completion. The effect is also economically significant. In columns (1) to (3) of panel B, a treated individual is about 7% more likely to leave the non-tradable sector after merger completion. Further, as columns (4) to (6) indicate, an individual working in the non-tradable sector is 3% more likely to become unemployed after merger completion. Overall, the results from table 9 confirm the findings at the MSA level that M&As in the manufacturing sector not only lead to a reduction in employment in the manufacturing sector, but also lead to a negative spillover on employment in the non-tradable sector.

4.9. Cross-sectional Variation

4.9.1. Firm Heterogeneity

I further explore the heterogeneous impact of M&As on the employment growth for firms of different ages. I follow Appel et al. (2019) and aggregate the QWI data for young firms (less than or equal to 5 years old), mature firms (6-10 years old), and old firms (older than 10 years) and calculate the three-year employment growth rate separately for each group. Columns (1) to (3) in table 9 report the estimated results for the firms in different age groups, indicating that young and old firms are more likely to be affected, while the effect is trivial on mature firms. Column (1) in table 10 shows that an MSA with a completed merger is associated with a 90 basis points lower three-year employment growth rate among young firms in the non-tradable sector. These results are consistent with that of Adelino et al. (2017) that young firms from the non-tradable sector account for the bulk of net employment creation in response to local demand shocks. Similarly, firms that are more than 10 years old are also subject to the negative impact of merger completion although the economic magnitude is smaller (50 basis points).

In columns (4) and (5) of table 10, I test the effect of merger completion on firms of different sizes. In column (4), I focus on small firms (firms with less than 50 employees) while in column (5) I focus on large firms (firms with more than 50 employees). It is apparent that merger completion affects small firms in the non-tradable sector more than it does the larger firms. One possible explanation is that small firms in the non-tradable sector might be more susceptible because of financial constraints and lack of operational flexibility, while large firms, such as franchised businesses, might be able to absorb the local demand shock through large national networks.

4.9.2. MSA Heterogeneity

In this section, I test whether MSAs with different degrees of dependence on the manufacturing sector are affected differentially by M&As. Presumably, MSAs with a greater presence of the manufacturing sector and a smaller presence of the non-tradable sector should experience a greater spillover effect. For this purpose, I construct the following measure as a proxy for the magnitude of the spillover effect:

$$Dependence_{i,t} = \frac{Manufacting\ Emp_{i,t}}{Nontradable\ Emp_{i,t}}, \tag{18}$$

where $Manufacting\ Emp_{i,t}$ is the employment in the manufacturing sector of MSA_i at time t, and $Nontradable\ Emp_{i,t}$ is the employment in the non-tradable sector of MSA_i at time t. The higher the ratio, the greater the dependence of the non-tradable sector on the manufacturing sector. To mitigate the effect of labor market dynamics on the evolution of the relative size of the manufacturing sector and the non-tradable sector, I calculate the time-series median of the measure and split the sample based on high and low dependence.[16] table 10 reports the regression results estimated with the subsamples of high and low dependence.

Column (1) of table 11 reports the results when the dependence is high. The Deal dummy is

[16] I repeat the tests on subsamples based on cross-sectional median dependence. The results remain statistically and economically unchanged.

negative and statistically significant. An MSA with high dependence is expected to experience a 0.4% lower growth in non-tradable sector employment. However, when I estimate the tests with MSAs with a lower dependence on manufacturing sector, the coefficient on the Deal dummy is statistically insignificant, as shown in column (2).

4.9.3. Deal Heterogeneity

My analysis so far assumes that all types of mergers have a similar effect on local employment. In this section, I test the heterogeneous effect of different types of mergers. For example, horizontal mergers are more likely to be motivated by potential synergy gain through cost savings, such as workforce reduction, than other types of mergers. In that case, the MSAs where the target firms of horizontal mergers are located are expected to experience a greater post-merger employment loss. Consequently, the local area should experience a stronger drop in consumer demand, which can cause a slower employment growth in the non-tradable sector. Meanwhile, as previous studies, such as Tate and Yang (2016) and Lagaras (2018) show, diversifying mergers are usually associated a lower probability of employment reduction. Consequently, the MSAs where the target firms of diversifying mergers are located should be less affected after merger completion.

In table 12, I test the local spillover effects of different types of takeovers. Columns (1) and (2) report the effect of merger completion on the non-tradable sector employment growth for diversifying mergers and other types of mergers. The drop in the non-tradable sector employment growth is weaker when the deal is diversifying. Similarly, in columns (3) and (4), I compare the effects of horizontal mergers and other deals. As expected, merger completion has a stronger effect when a deal is horizontal compared to other types of deals. This further shows that when there is a greater room for cost reduction and labor restructuring, the post-merger employment reduction will be stronger and there will be a stronger negative spillover to the local non-tradable sector.

5. Labor Protection and Local Spillover

In this section, I explore whether state level labor protection can pose heterogeneous effects on local labor market spillover. I focus on two aspects: union coverage and minimum wage requirements, which might affect the spillover effects to the non-tradable sector through indirect and direct channels, respectively.

5.1. Union Coverage

I first explore how union coverage in a state could affect the spillovers from manufacturing sector takeovers to the non-tradable sector. I use the fraction of labor that is covered by union protections as a proxy for collective bargaining power and split the sample based on high and low union coverage. Compared to the manufacturing sector, the non-tradable sector has a lower union coverage rate. [17] Therefore, if union coverage affects the spillover, it would be indirectly from the employment growth in the manufacturing sector.

The effect of union coverage is ex-ante ambiguous. While some researchers argue that better employee protections can make layoffs more difficult (John et al., 2015), others predict a lower or negative employment growth at the union firms (Long, 1993; Blanchflower et al., 1991; Hirsch, 2017; Li, 2012, etc.). The argument is that firms with a higher union coverage are constrained on incremental layoffs, so they opt to concentrate the layoffs around major corporate events, such as an M&A.

In the first four columns of Table 13, I test the effect on the manufacturing sector. Columns (1) and (2) report the changes in employment growth in the manufacturing sector after merger completion. While the Deal dummy is negative and statistically significant in states with high labor union coverage, it is statistically insignificant in states with low union coverage. This

[17] For example, according to the U.S. Bureau of Labor Statistics report, while 9.1% of the employees from manufacturing sector were union members in 2017, only 2.2% of employees from Accommodation and Food Services and 4.5% of employees from Retail Trade were members of labor unions or similar professional associations. For details, see https://www.bls.gov/news.release/pdf/union2.pdf.

is consistent with the results reported by Li (2012), who finds that targets in more unionized industries experience worse wage and employment outcomes after takeovers. Further, I explore the employment change in the non-tradable sector in areas with high and low union coverage in columns (3) and (4). Consistent with the findings in the first two columns, while deal completion is negative and statistically significant for the three-year non-tradable sector employment growth in areas with high union coverage, the effect on employment growth is insignificant in areas with low union coverage. The findings in panel A of Table 13 provides supportive evidence on the spillovers from manufacturing sector mergers to the non-tradable sector.

5.2. Minimum Wage and Employment Change

Finally, I explore whether state-level legislation on minimum wages could impact the spillover effect on the local labor market. Previous studies (see Gustafson and Kotter, 2018; Cengiz et al., 2019, etc.) found that the non-tradable sector employs more minimum wage labor and firms in the non-tradable sector are, therefore, more sensitive to changes in minimum wage requirements. [18] Therefore, the spillover effect on the non-tradable sector employment might be different due to the varying minimum wage requirements in different states. I split the sample into subsamples based on whether the state minimum wage is above or below the federal requirement of minimum wages.

Panel B of Table 13 reports the estimation results. In columns (1) and (2), I test the effect of merger completion on the manufacturing employment growth in states with minimum wages that are above/below the federal level. The results in columns (1) and (2) are statistically and economically similar to each other, indicating that the effect of M&As on employment in the manufacturing sector is not sensitive to minimum wage requirements, as firms in the manufacturing factor usually pay wages higher than the legal minimum wage. In columns (3)

[18] For example, Cengiz et al. (2019) point out that *"The minimum wage is more binding in the non-tradable sector (6.6%) than in the tradable sector (1.6%) or in the manufacturing sector (1.7%)."*

and (4), I test the effect of merger completion on the non-tradable sector employment growth. M&As have a negative and statistically significant effect on the three-year employment growth in the non-tradable sector only in states with minimum wages that are higher than the federal level. Combined with the results from the previous sections, the results in Panel B indicate that while mergers in the manufacturing sector might have a negative effect on the non-tradable sector employment growth through deteriorated consumer demand, lax minimum wage requirements could mitigate the severity of the negative spillover in the non-tradable sector.

Overall, section 7 suggests that while labor union coverage can worsen the negative spillover effect to the non-tradable sector, lax minimum wage requirements might help to absorb the pressure on the non-tradable sector employment.

6. Conclusion

In this paper, I examine the spillover effects of M&As on the local communities. By focusing on M&As with targets in the manufacturing sector, I find that M&A deals not only lead to a lower three-year employment growth rate in the manufacturing sector but also reduce the non-tradable sector employment growth through decreased local consumer demand. Young firms, small firms, and targets from concentrating deals receive a more substantial effect. Finally, lax minimum wage requirements help to ease the downward pressure on employment in the non-tradable sector in areas where the target firm is located.

This study highlights a previously overlooked externality of M&As. From a corporate efficiency perspective, takeovers are often regarded as effective methods for cost reduction and wealth creation; however, the improvement in private profits could be accompanied by a cost on the local community. While authorities, such as the Federal Trade Commission and the Department and Justice, mostly consider the potential effects of M&As on consumer welfare,

the potential influence on local communities also deserves attention.

Although this study sheds some light on the differential effects on local employment across states with different labor protections, it still requires more research to provide a thorough investigation of labor policy implications. It would also be beneficial for future research to explore changes in local household behaviors resulting from corporate takeovers.

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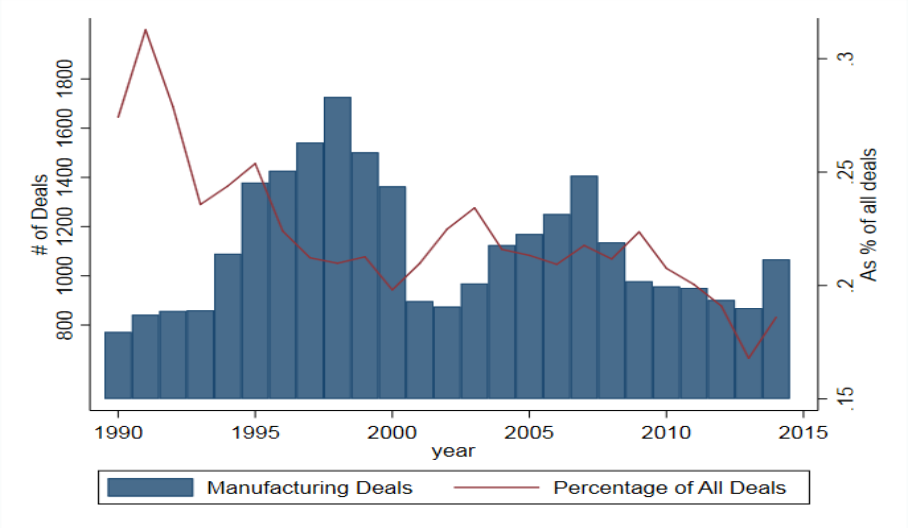
Figure 1. M&As in Manufacturing Sector

(a) Number of Deals



(b) Total value of Deals

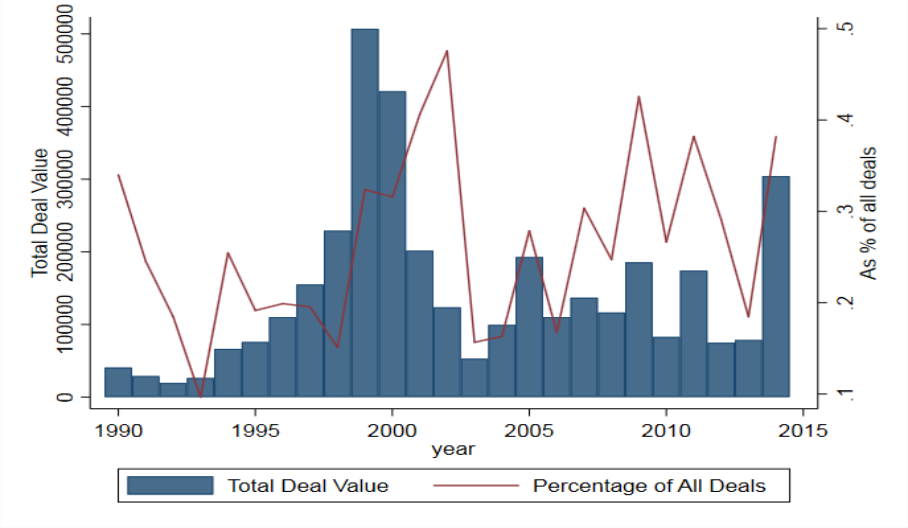
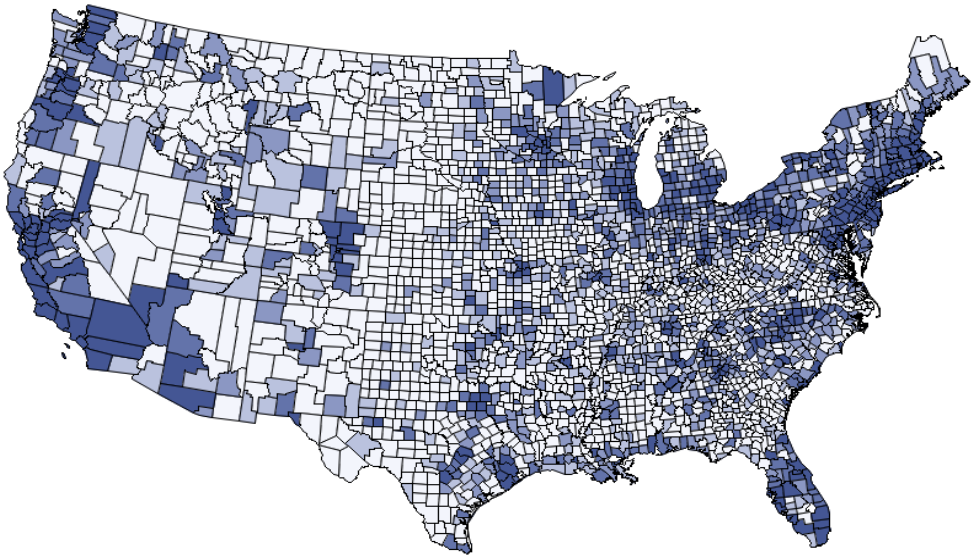


Figure 1 presents the number (ratio) (Figure 1a) and the value (ratio) (Figure 1b) of merger and acquisition deals in the manufacturing sector between 1990 to 2014. The bars represent the number of values in a given year and the solid line represents the fraction of deals where the target is in manufacturing sector relative to the total number or deal value of all acquisitions in a given year. All values are in 2010 dollars.

Figure 2. M&As in Manufacturing Sector: Geographic Distribution

(a) Number of Deals



(b) Total Value of Deals

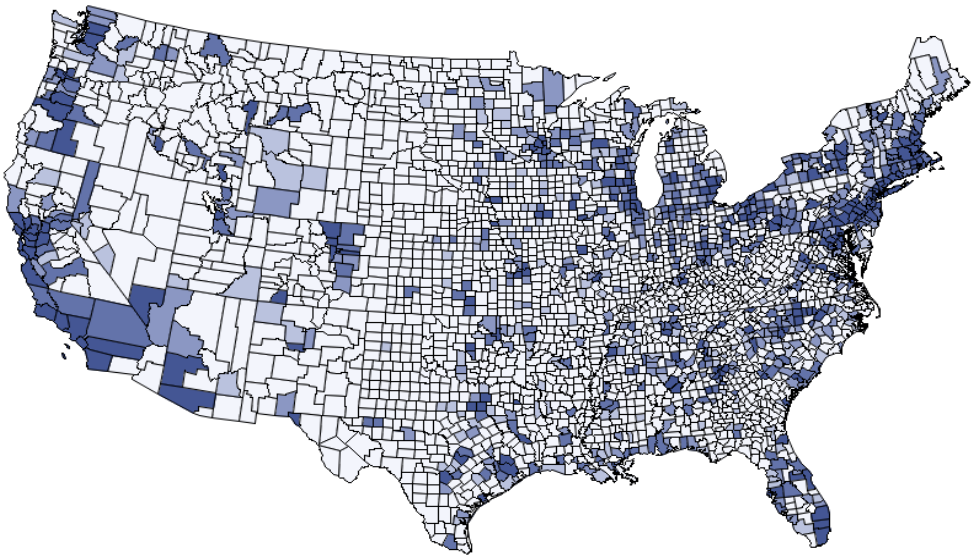
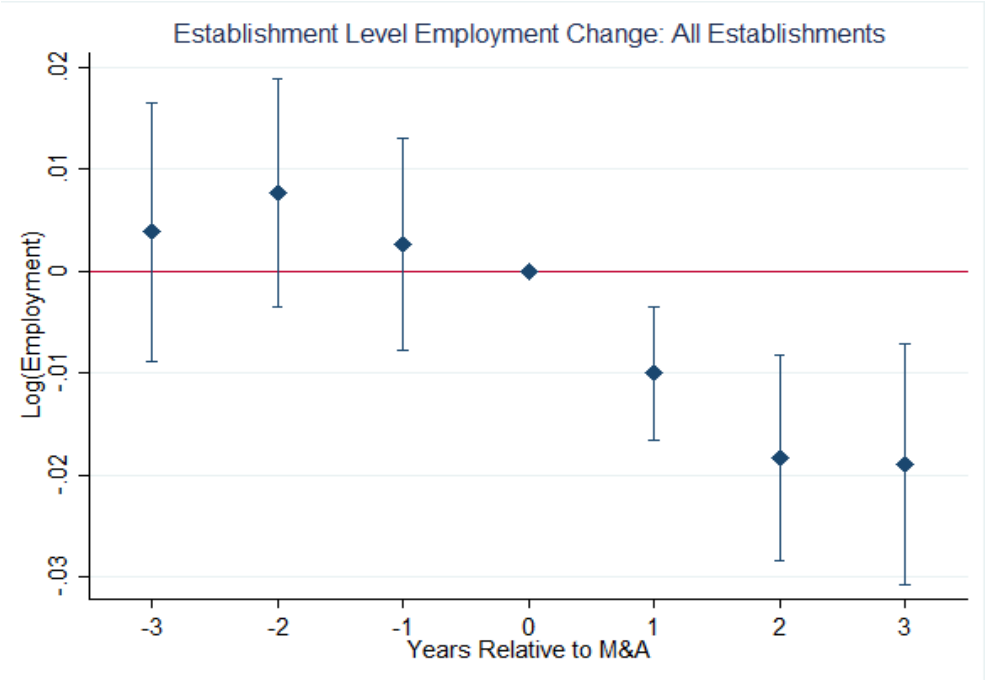


Figure 2 presents the geographic distribution of all acquisitions with targets in the manufacturing sector. Figure 2a reports the quintiles of total number of deals in each county from 1990 to 2014. Figure 2b reports the quintiles of total deal value (million dollars) in each county. All values are in 2010 dollars.

Figure 3. Establishment Employment Growth Dynamic Change

(a) All Establishments



(b) Manufacturing

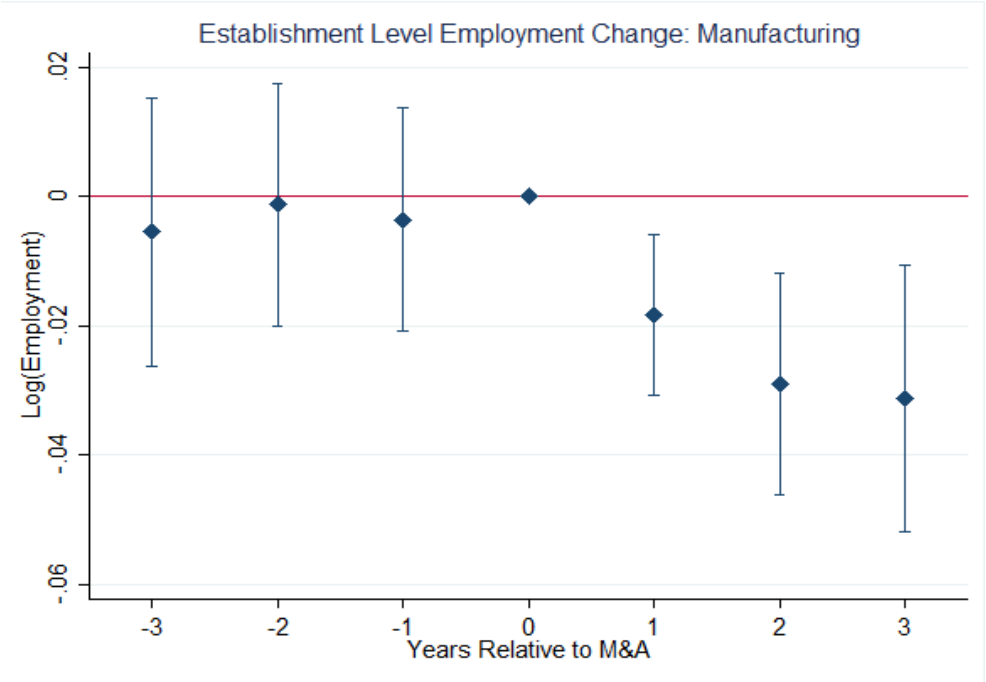


Figure 3 presents the dynamic change of the establishment level employment around the M&A completion. Figure 3a reports the log employment change in all establishments. Figure 3b reports the employment change in the establishments in the manufacturing sector.

Table 1 Summary Statistics

The table presents the summary statistics. The MSA-quarterly data is from U.S. Census Quarterly Workforce Indicators (QWI) from 1990 to 2016. Manufacturing sector is defined as industries with two-digit-NAICS code 31-33. Non-tradable sector is defined as industries with two digit-NAICS code 44-45 and 72. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. All wages,incomes and market values are in 2010 dollars.

	N	Mean	S.D.
MSA Characteristics			
M&A Event	23,108	0.0506	0.219
Total Employment	23,108	225,916	489,206
Manufacturing Employment	23,108	29,084	51,645
Nontradable Sector Employment	23,108	50,130	99,038
Unemployment Rate	23,108	0.063	0.029
Population	23,108	685,438	1,433,016
Per capita Income	23,108	32,466	9,069
% Manufacturing Employment	23,108	0.160	0.0884
% Non-tradable Sector Employment	23,108	0.242	0.0478
Non-tradable Sector Weekly Wage	23,108	404.1	61.11
Manufacturing Sector Weekly Wage	21,707	959.6	241.9
Establishment Characteristics			
Employment (All)	336,451	508.15	492.40
Employment (Manufacturing)	131,012	579.15	584.99

Table 2 Effect of M&As on the Establishment Level Employment

The table presents regression estimates of the difference-in-differences estimates of the effect of M&A on establishment level employment. Weighted results are weighted by the employment at the establishment during the year prior to the merger. Manufacturing sector is defined as industries with two-digit-NAICS 31-33. All the regressions include the establishment fixed effects and year fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the establishment level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable: Log(Employment)				
Panel A: DID Test				
	All Firms		Manufacturing Sector	
	(1)	(2)	(3)	(4)
$Treated \times Post$	-0.013***	-0.024***	-0.015***	-0.025**
	(-3.64)	(-3.72)	(-3.18)	(-2.39)
Year FE	Yes	Yes	Yes	Yes
Establishment FE	Yes	Yes	Yes	Yes
Weighted	No	Yes	No	Yes
Observations	336,451	336,451	131,012	131,012
Adjusted R-squared	0.924	0.937	0.909	0.930
Panel B: Dynamic Change				
	All Firms		Manufacturing Sector	
	(1)	(2)	(3)	(4)
$T-3$	-0.000	0.004	-0.004	-0.005
	(-0.04)	(0.59)	(-0.71)	(-0.52)
$T-2$	0.002	0.008	0.000	-0.001
	(1.01)	(1.34)	(0.04)	(-0.13)
$T-1$	-0.001	0.003	-0.003	-0.004
	(-0.35)	(0.51)	(-0.98)	(-0.40)
$T+1$	-0.007***	-0.010***	-0.011***	-0.018***
	(-3.12)	(-3.01)	(-4.26)	(-2.91)
$T+2$	-0.012***	-0.018***	-0.018***	-0.029***
	(-3.79)	(-3.55)	(-4.68)	(-3.30)
$T+3$	-0.014***	-0.019***	-0.019***	-0.031***
	(-3.78)	(-3.15)	(-4.14)	(-2.97)
Year FE	Yes	Yes	Yes	Yes
Establishment FE	Yes	Yes	Yes	Yes
Weighted	No	Yes	No	Yes
Observations	401,987	401,987	156,509	156,509
Adjusted R^2	0.928	0.939	0.913	0.933

Table 3 Manufacturing Mergers and Employment Change

The table presents regression estimates of the three-year growth rate of employment in the manufacturing sector (two-digit-NAICS 31-33) after the completion of influential mergers. The dependent variable is the three-year employment growth rate. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. All the regressions include the MSA fixed effects and year-quarter fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the state by time level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable: Average 3-Year Employment Growth				
	(1)	(2)	(3)	(4)
M&A Event$_{t-4,t}$	-0.006***	-0.005***	-0.004***	-0.003***
	(-6.20)	(-4.97)	(-4.36)	(-3.40)
Log(Total Employment)$_{t-4}$		-0.131***	-0.158***	-0.097***
		(-14.68)	(-18.63)	(-6.90)
Log(Total Income)$_{t-4}$		-0.330***	-0.199***	-0.190***
		(-12.65)	(-7.56)	(-6.44)
Manufacturing Share$_{t-4}$			-1.389***	-1.734***
			(-26.05)	(-28.80)
MSA FE	Yes	Yes	Yes	Yes
Year-quarter FE	Yes	Yes	Yes	No
State-Year-Quarter FE	No	No	No	Yes
Observations	22,104	22,104	22,104	21,873
Adjusted R^2	0.346	0.409	0.445	0.552

Table 4 Manufacturing Mergers and Non-Tradable Sector Employment Change

The table presents regression estimates of the three-year growth rate of employment in the Non-tradable sector (two-digit-NAICS 44-45, 72) after merger completion. The dependent variable is the three-year employment growth rate. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. T-statistics are report in the parenthesis and the standard error is clustered at the state by time level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable: Average 3-Year Employment Growth				
	(1)	(2)	(3)	(4)
M&A Event$_{t-4,t}$	-0.003***	-0.003***	-0.003***	-0.002***
	(-5.90)	(-5.15)	(-5.22)	(-4.43)
Log(Total Employment)$_{t-4}$		-0.084***	-0.082***	-0.066***
		(-12.56)	(-12.46)	(-7.41)
Log(Total Income)$_{t-4}$		-0.014	-0.022	-0.045
		(-1.13)	(-1.72)	(-3.79)
Manufacturing Share$_{t-4}$			0.090	0.074
			(2.34)	(2.78)
MSA FE	Yes	Yes	Yes	Yes
Year-quarter FE	Yes	Yes	Yes	No
State-Year-Quarter FE	No	No	No	Yes
Observations	22,104	22,104	22,104	21,873
Adjusted R^2	0.271	0.345	0.346	0.554

Table 5 Robustness Tests

The table presents robustness tests on the three-year growth rate of employment in the Non-tradable sector (two-digit-NAICS 44-45, 72) after merger completion. The dependent variable is the three-year employment growth rate. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. Column 1 reports results estimated using the placebo time of deal completion. Column 2 reports the results estimated using withdrawn deals. Columns (3) reports results estimated with sample excluding year 2007-2010. All regressions include the MSA fixed effects and state by time fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the state by time level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable: 3-Year Employment Growth				
	Placebo Dates	Withdrawn Deals	Excluding 07-10	Control Chinese Import
	(1)	(2)	(3)	(4)
M&A Event$_{t-4,t}$	-0.001	0.002	**-0.0015*** **	**-0.0015*** **
	(-0.25)	(0.96)	**(-3.24)**	**(-2.43)**
Control	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
State-Year-quarter FE	Yes	Yes	Yes	Yes
Observations	21,873	21,873	16,901	13,494
Adjusted R^2	0.554	0.554	0.563	0.668

Table 6 2SLS Estimates

The table presents regression estimates of the two stage least square regressions. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. Column 1 and 2 report results of the first stage estimation. Local discount is defined as the weighted average discount of a 4-digit-Naics Industry interact with the local industry presence. Column 3 and Column 4 report regression results of reduced form regression. Column 5 to 8 report the results from the second stage regression. All the regressions include the MSA fixed effects and State by time fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the state by time level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

	First Stage		Reduced Form		Second Stage			
Dep Var	M&A Event$_{t-4,t}$		Manufacturing	Non-tradable	Manufacturing		Non-tradable	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local Discount	-0.016***	-0.018***	0.002***	0.001***				
	(-3.74)	(-3.83)	(3.36)	(5.71)				
M&A Event$_{t-4,t}$					-0.177***	-0.132***	-0.056***	-0.084***
					(-3.14)	(-2.79)	(-3.05)	(-3.62)
Control	No	Yes	Yes	Yes	No	Yes	No	Yes
MSA FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Year-quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,002	19,292	19,292	19,292	21,002	19,292	21,002	19,292
Adjusted R^2	0.078	0.084	0.554	0.529	-	-	-	-

Table 7 Wage and Mobility

The table presents regression estimates of merger completion on the wage and employment mobility. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. Columns (1) and (2) report effect of merger on three-year growth rate of average weekly wage in manufacturing sector (two-digit-NAICS 31-33) and non-tradable sector (two-digit-NAICS 44-45, 72) estimated with MSA-quarterly data. Columns (3) and (4) report change in the three-year growth rate in population and labor force respectively estimated with MSA-annual data. All the regressions control for MSA fixed effects and state by time fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the state by time level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dep Var Growth	Manufacturing Wage Growth Growth	Non-tradable Wage Growth	Population Growth	Labor Force Growth
	(1)	(2)	(3)	(4)
M&A Event	-0.008*** (-3.30)	-0.004* (-1.75)	-0.002 (-1.61)	-0.004** (-2.10)
Control	Yes	Yes	Yes	Yes
State-Year-Quarter FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	19,340	19,340	4,935	4,935
R^2	0.272	0.307	0.790	0.571

Table 8 Summary Statistics: Household Level

The table reports the summary statistics of the household level sample. The data is from Survey of Income and Program Participation (SIPP) from 1995 to 2003. Individuals with age below 16 or above 70 are dropped from the sample. College is an indicator equal 1 if the individual achieved college degree or higher. Manufacturing is an indicator equal 1 if the individual is working in manufacturing sector (2-digit-NAICS code 31-33). Non-tradable is an indicator equal 1 if the individual is working in non-tradable sector (2-digit-NAICS code 44-45, 72).

	N	Mean	S.D.
a. Individual Characteristics			
Age	279,549	39.96	14.35
Married	279,549	0.53	0.499
College Degree	279,549	0.305	0.461
Manufacturing	279,549	0.093	0.291
Non-tradable	279,549	0.120	0.325
Employment	279,549	0.729	0.444
b. MSA Characteristics			
Population	279,549	5,314,614	5,690,991
Average Wage (in 2010$)	279,549	35,952.6	7,043.884
Labor Force	279,549	2,669,128	2,760,993
Unemployment	279,549	.0490	0.0170

Table 9 Local Spillover of M&A: Household Level

The table reports results estimated at individual level with data from Survey of Income of Program Participation (SIPP) from 1995 to 2003. In panel A, the dependent variable in first three columns is whether the individual is working in manufacturing sector in the current year. Dependent variable in columns (4) to (6) is whether the individual is employed during the current year. Treated group is defined as individuals working in manufacturing sector during the year before the merger. In panel B, dependent variable in first three columns is whether the individual is working in non-tradable sector in the current year. Dependent variable in columns (4) to (6) is whether the individual is employed during the current year. Treated group is defined as individuals working in non-tradable sector during the year before the merger. Post is an indicator equal 1 for MSA-years within 3 years of the completion of an influential merger. Control variables in the table include log(MSA labor force), log(MSA average wage), MSA unemployment rate, log (age), college degree, married. T-statistics are report in the parenthesis and the standard error is clustered at the MSA level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Individuals Working in Manufacturing Sector						
Dep. Var	Manufacturing			Employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated × Post	-0.045***	-0.045***	-0.045***	-0.037***	-0.032***	-0.035***
	(-3.02)	(-3.01)	(-2.81)	(-6.06)	(-5.13)	(-5.51)
Post	-0.003**	-0.003**	0.043***	-0.001	-0.000	-0.077***
	(-2.28)	(-2.00)	(-63.65)	(-0.28)	(-0.08)	(-20.81)
Treated	0.277***	0.276***	0.280***	0.090***	0.083***	0.087***
	(34.18)	(34.14)	(33.57)	(17.08)	(15.41)	(15.49)
Control Variables	No	Yes	Yes	No	Yes	Yes
MSA FE	Yes	Yes	No	Yes	Yes	No
Year FE	Yes	Yes	No	Yes	Yes	No
MSA × Year FE	No	No	Yes	No	No	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	279,549	279,549	292,832	279,549	279,549	292,832
Adjusted R^2	0.788	0.788	0.787	0.702	0.705	0.708

Local Spillover of M&A: Household Level *Continued*

Panel B: Individuals Worked in Non Tradable Sector						
	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var	Nontradable			Employed		
Treated × Post	-0.069***	-0.072***	-0.073***	-0.019**	-0.029***	-0.029***
	(-3.26)	(-3.34)	(-3.24)	(-2.22)	(-3.08)	(-3.01)
Post	-0.004	-0.004	-0.023***	-0.004	-0.003	-0.070***
	(-1.37)	(-1.45)	(-4.72)	(-0.95)	(-0.68)	(-19.83)
Treated	0.383***	0.389***	0.392***	0.143***	0.162***	0.165***
	(48.84)	(48.84)	(45.75)	(24.01)	(25.50)	(24.10)
Control Variables	No	Yes	Yes	No	Yes	Yes
MSA FE	Yes	Yes	No	Yes	Yes	No
Year FE	Yes	Yes	No	Yes	Yes	No
MSA × Year FE	No	No	Yes	No	No	Yes
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	279,549	279,549	292,832	279,549	279,549	292,832
Adjusted R^2	0.696	0.696	0.698	0.704	0.708	0.710

Table 10 Merger Spillovers: Firm Heterogeneity

The table presents regression estimates of merger completion on the three-year non-tradable sector employment growth rate across different firm groups. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. Columns (1) to (3) reports change in the employment growth rate by different firm age groups while columns (4) and (5) reports change in employment growth rate across groups by different firm size groups. All the regressions include the MSA fixed effects and State by time fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the state by time level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable: 3-Year Employment Growth					
	Firm Age			Firm Size	
	< 5 years	$5 - 10$ years	> 10 years	≤ 50 employees	> 50 employees
	(1)	(2)	(3)	(4)	(5)
M&A Event$_{t-4,t}$	-0.009*	-0.003	-0.005***	-0.004***	-0.001
	(-1.69)	(-0.74)	(-3.63)	(-2.84)	(-0.67)
Control	Yes	Yes	Yes	Yes	Yes
State-Year-Quarter FE	Yes	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes	Yes
Observations	21,873	21,873	21,873	18,232	18,232
Adjusted R^2	0.356	0.251	0.431	0.506	0.465

Table 11 Merger Spillovers: MSA Heterogeneity

The table presents regression estimates of merger completion on the three-year non-tradable sector employment growth rate across MSAs with high and low dependence on manufacturing sector employment. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. All the regressions control for the MSA fixed effects and State by time fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the state by time level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable: 3-Year Employment Growth		
	Dependence on Manufacturing	
	High	Low
	(1)	(2)
M&A Event$_{t-4,t}$	-0.004**	-0.002
	(-1.99)	(-0.85)
Control	Yes	Yes
State-Year-Quarter FE	Yes	Yes
MSA FE	Yes	Yes
Observations	10,451	10,627
Adjusted R^2	0.572	0.538

Table 12 Merger Spillovers: Deal Heterogeneity

The table presents regression estimates of merger completion on the three-year employment growth rate across different types of deals. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. Columns (1) to (2) report changes in employment growth in subsamples with diversifying deals vs non-diversifying deals while columns (3) and (4) report change in employment growth in subsamples with horizontal deals vs other deals. All regressions control for the MSA fixed effects and State by time fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the state by time level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable: 3-Year Employment Growth				
	Diversifying Deals	Concentrating Deals	Horizontal Deals	Other Deals
	(1)	(2)	(3)	(4)
M&A Event$_{t-4,t}$	-0.001	-0.007***	-0.008***	-0.002
	(-0.47)	(-4.24)	(-4.68)	(-1.52)
Control	Yes	Yes	Yes	Yes
State-Year-Quarter FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	21,873	21,873	21,873	21,873
Adjusted R^2	0.554	0.554	0.554	0.554

Table 13 Labor Protection and Spillover Effect

The table presents regression estimates of M&A completion on the three-year non-tradable sector employment growth rate across states with different levels of labor protection. M&A Event is defined as an indicator equal 1 if an MSA experienced a significant jump in merger activities in the past 4 quarters. Panel A tests the effect of merger completion across states with different union coverage. High and Low represent whether the level of union coverage in a state is higher or lower than the sample median. Panel B tests the effect of merger completion across states with different levels of minimum wages. In both panels, columns (1) and (2) report changes in employment growth rate in manufacturing sector (two-digit-NAICS 31-33) and columns (3) and (4) report change in employment growth rate non-tradable sector (two-digit-NAICS 44-45, 72). All the regressions control for MSA fixed effects and year-quarter fixed effects. T-statistics are report in the parenthesis and the standard error is clustered at the state level. ***,**, * denotes statistical significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable: 3-Year Employment Growth				
Panel A: Union Coverage				
	Manufacturing Sector		Non tradable Sector	
	High	Low	High	Low
	(1)	(2)	(3)	(4)
M&A Event$_{t-4,t}$	-0.016***	0.004	-0.006**	-0.007
	(-3.27)	(0.48)	(-2.46)	(-1.38)
Control	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	10,450	9,147	10,450	9,147
R^2	0.518	0.426	0.402	0.380
Panel B: Minimum Wage				
	Manufacturing Sector		Non tradable Sector	
	High	Low	High	Low
	(1)	(2)	(3)	(4)
M&A Event$_{t-4,t}$	-0.014**	-0.020**	-0.005**	-0.003
	(-2.17)	(-2.21)	(-2.02)	(-1.08)
Control	Yes	Yes	Yes	Yes
Year-Quarter FE	Yes	Yes	Yes	Yes
MSA FE	Yes	Yes	Yes	Yes
Observations	15,533	6,568	15,533	6,568
Adjusted R-squared	0.455	0.472	0.430	0.489