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ABSTRACT

This paper asks whether startups react more to changing investment opportunities than more mature firms do. We use the fact that a region's pre-existing industrial structure creates exogenous variation in the severity of its exposure to nation-wide manufacturing shocks to develop an instrument for changing investment opportunities, and examine employment creation in the non-tradable sector as a response to those opportunities. Startups are much more responsive to changing local economic conditions than older firms. Moreover, their responsiveness doubles in areas with better access to small business finance, suggesting that financing constraints are an important brake on job creation in the startup sector. Although we focus mostly on the non-tradable sector for empirical identification, our results extend to other sectors of the economy, indicating that the mechanisms we uncover are economically pervasive. This suggests that factors like organizational flexibility and innovativeness may be important drivers of job creation among startups.

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1 Introduction

Understanding how firms respond to changing investment opportunities is one of the central themes of financial economics. In the absence of frictions, classical Q-theory says that firms should invest in all projects with positive net present value. However, recent work by Haltiwanger, Jarmin and Miranda (2013) shows that young firms are responsible for almost all the net creation of jobs in the economy, suggesting that firm age is likely to play an important role in how firms respond to investment opportunities. The existing literature has generally focused on the differential response by small and large firms to shocks (Gertler and Gilchrist, 1994; Chari et al., 2008; Moscarini and Postel-Vinay, 2012), but the role of firm *age*, as opposed to *size*, has received much less attention. This issue has taken on special importance in the wake of the pronounced economic dislocations of the 2007-2009 recession, as entrepreneurial firms were especially hard hit in the downturn (Fort, Haltiwanger, Jarmin and Miranda, 2013).

In this paper we ask whether young firms are more responsive to shocks to investment opportunities than older firms. The fact that job creation is more pronounced among young businesses could be driven by a number of different mechanisms. The first is that underlying economic forces stimulate both job creation and firm creation simultaneously. The second is that the process of firm creation itself stimulates the economy. The third is that startups are more sensitive to changing business conditions than older firms. Distinguishing between these alternative hypotheses is important not only for economic policy, but for our understanding of job creation in the economy more generally.

The endogeneity of firm creation, employment growth and business conditions poses empirical challenges that make identifying the specific channel of firm responsiveness to changing investment oportunities especially difficult. To overcome these challenges, we follow Bartik (1991) and Blanchard and Katz (1992) and employ an identification strategy that takes advantage of *exogenous* shocks to local investment opportunities. We begin by interacting changes in nationwide employment in the manufacturing sector with the preexisting

sectoral composition of manufacturing in a local region.[1] We use these exogenous changes in manufacturing employment in a region as an instrument for local income shocks.[2] Then we examine how employment growth across different firm-age categories in the *non-tradable* sector responds to these exogenous shocks to local income. The underlying assumption is that higher local income creates investment opportunities for firms that depend primarily on local demand, either through higher income per capita, or through inward migration.

Our goal is then to contrast two competing hypotheses. One is that young firms, by virtue of being more nimble and facing fewer bureaucratic constraints, are better able to seize upon new opportunities in the marketplace. The contrasting hypothesis is that older firms, because they have more resources, are potentially less opaque, and therefore have readier access to outside capital, are more responsive.

We offer a number of findings that relate job creation, business creation and financing constraints. First, in keeping with previous work, we find that young firms are responsible for the bulk of net job creation in the non-tradable sector. This is clear from summary statistics on net job creation in the sector: between 1999 and 2007, firms less than two years old created more than 2,365 jobs per region/year, while older firms mostly shed jobs. On balance, young firms account for 1.5 to 3 times the total net job creation in the sector across the firm-age distribution. These facts about firm age and job creation are especially striking in light of the overall firm-age distribution of jobs: Employment in 0 to 1 year-old firms on average accounts for 6 percent of the total regional employment. Firms over six years old account for more than 84 percent on average in each commuting zone. This enriches the distinction between small firms and young firms first offered in Haltiwanger et al. (2013).

More importantly, we also find that young firms are much more sensitive to changes in investment opportunities than any other firm age group. A one percentage point increase in regional income raises new firm job creation by more than 0.2 percent of the total employment in the non-tradable sector in the region in 2000; firms aged six years or older show significantly

[1] We use commuting zones (CZs), defined by the Department of Agriculture for labor market research, as our primary unit of observation. The precise definition of CZ's is detailed in Section 2.

[2] We also use changes in the industry-level imports from China as the source of the shock to manufacturing, in a similar vein as Autor, Dorn and Hanson (2013).

lower sensitivities, and the point estimate is much more sensitive to the sample period we use. Firms two to six years of age show no responsiveness to changing investment conditions. The magnitude of this effect is especially striking given the distribution of jobs by firm age discussed above. These results are mostly driven by positive shocks to local income (meaning that young firms create jobs when times are good, and are not as sensitive to local downturns) and they are robust to using the changes in the imports from China as the nationwide shock to manufacturing, to using counties or Metropolitan Statistical Areas as our unit of observation, and to including regional random effects as well as regional demographic covariates.

Our focus on the non-tradable sector is important for several reasons. The inherently local nature of the output supplied by non-tradables provides us with greater precision to identify the geographic shocks we exploit. This is the same logic that drives Mian and Sufi (2012) to focus on the non-tradables sector. For us, it means that our results do not merely point to a correlation between economic conditions and young firm job creation: they show how firms across the age distribution respond differently to exogenous shocks to their local investment opportunities. Also, the product and technological innovation advantage, which is often thought to accrue to startups, is not likely to be as important in the non-tradable sector (although it may still play a role). Instead, organizational form, incentives, and the degree of internal bureaucracy are all likely to contribute to the ability of young start-ups to respond to shocks more sizably than older firms. Our data does not allow us to identify the mechanism by which young start-ups respond to local investment opportunities, but it raises the possibility that mechanisms other than narrowly-defined technological innovation are likely to play a role. Finally, focusing on the non-tradable sector and on (instrumented) shocks to local income allows us to distinguish this channel from the collateral channel. In general, our instrument could affect both income and demand for housing in an area, but the non-tradable sector is the one where the relative importance of income shocks is likely to be largest. As we show in the robustness section, the effect we uncover is almost unchanged in areas with high and low house price appreciation.[3]

[3]Real estate is a primary source of collateral driving employment in small firms; see, e.g., Adelino, Schoar and Severino (2013), Kleiner (2013) and Schmalz, Sraer and Thesmar (2013).

In light of the fact that a simple technological advantage is unlikely to fully explain the effect we find for non-tradable firms, the heightened responsiveness of young firms is somewhat puzzling: startups are widely thought to face financing constraints that impede their ability to respond to changing economic conditions. Is there evidence that financial constraints prevent startups from exploiting local economic shocks more fully? Are financing constraints economically important?

To explore this idea we build on recent work by Robb and Robinson (2012) illustrating the importance of bank debt for startup activity and develop geographic variation in deposit concentration held by local banks as a proxy for access to capital. The idea here is that because large (non-local) banks are less likely to lend to startups than smaller, local banks, areas with retail bank deposits more heavily concentrated among local banks are areas in which startups face milder fund-raising constraints (Petersen and Rajan, 1994, 2002; Craig and Hardee, 2007). Consistent with this idea, we find that a higher market share of local banks is associated with a larger fraction of employment in start-ups, and an increased responsiveness of young firms to changing conditions. Moving from an area with low local bank concentration to an area where local bank concentration is high, the responsiveness of young firms essentially doubles. We find the reverse effect for firms over 6 years of age, where more local banks mutes the response to changing local income.

Given the focus of the existing literature on the role of firm size (instead of age), in the final section of the paper we offer results based on a Census dataset that breaks down employment in firms in different age categories into size bins (measured by the number of employees). While this analysis is no longer restricted to employment in the non-tradable sector due to lack of data availability, we use a similar setup as in our main analysis to look at which firms across the size distribution respond more to exogenous shocks to local income.[4] The results point to the responsiveness of young firms coming mostly from young small firms (less than 20 employees), whereas the responsivenes of older firms comes almost exclusively from firms with more than 100 employees. These results indicate that our results

[4]We discuss the differences between the Quarterly Workforce Indicators (QWI), our main data source, and the Census Business Dynamics Statistics (BDS) in more detail in Section 6.

are not limited to the non-tradable sector, but extend to other sectors of the economy where innovation and job creation are perhaps more important.

This paper is related to a number of recent papers exploring the mechanics of job creation. Mian and Sufi (2012) argue that much of the employment decline in the 2007-2009 recession is attributable to a drop in aggregate demand stemming from household balance sheets. These authors look at the effect of the drop in consumption on the local non-tradable sector, but they do not consider how firm age interacts with this effect. Likewise, our work is related to recent papers exploring the distinction between firm age and firm size (Haltiwanger et al., 2013; Fort et al., 2013; Hurst and Pugsley, 2011), as well as the literature on the impact of the recent crisis on young and small businesses (Fort et al., 2013; Duygan-Bump et al., 2010; Fairlie, 2013).

The remainder of the paper proceeds as follows. We begin in Section 2 by describing the data, our strategy for identifying localized economic regions, and our estimation strategy. In Section 3 we present our main findings on the link between firm age and the responsiveness to economic shocks. Because startups are widely thought to face financial constraints on their scale and scope, Section 4 examines the impact of local banking conditions on the employment responsiveness of startups. Section 7 concludes.

2 Data and Empirical Methodology

2.1 Firm Age and Employment Creation

We use the publicly-available Quarterly Workforce Indicators (QWI) data published by the Longitudinal Employer-Household Dynamics (LEHD) program of the U.S. Census Bureau to compute total employment by firm age. There are advantages and disadvantages to public-use data. Although they do not provide the same level of granularity that confidential (establishment-level) data allow, that granularity is not necessary for the purposes of this paper. Moreover, using publicly available data has the advantage that the results are easily replicable. In the online appendix to this paper we detail the process by which the data were

assembled and coded.[5]

This dataset provides total employment in the private sector tabulated for 5 firm age categories—start-ups (0-1 year-olds), 2-3 year-olds, 4-5 year-olds, 6-10 year-olds, and firms 11 years old or older. The totals are provided by county, quarter and industry, where industry is defined at the 2-digit National American Industry Classification System (NAICS) level. We aggregate the county-level observations in each age category to the Commuting-Zone (CZ) level.[6] As we discuss in more detail in Section 6, an alternative data source for employment by firm age is the Census Business Dynamics Statistics (BDS). The BDS has a couple of drawbacks for the purposes of our main analysis–first, and most importantly, it only provides a breakdown of employment by firm age and sector for the country as a whole, it does not report age by sector employment at a finer geographic level. Second, the finest level of geographic detail for employment by firm age is the Metropolitan Statistical Area (MSA). While we could use MSAs as our unit of observation, we prefer to use commuting zones given their cleaner economic motivation. The BDS data does have one advantage over the QWI–it provides employment by firm age *and by firm size* at the MSA level (without sector detail). We make use of this data in the last section of the paper.

The coverage of the LEHD data increases through time. The dataset covers 15 states in 1995, 37 states (including the District of Columbia) in 2000 (the first year in our analysis), and 45 states (including the District of Columbia) in 2007 (the last year we consider). During the whole period, six states are not covered—California, Louisiana, Massachusetts, Rhode Island, Virginia and Washington. We use yearly observations of the data as of the fourth quarter of each year. When we have the most coverage, our dataset includes 507 commuting zones.[7]

[5]The online appendix is available from the contact author's website.

[6]The details of how CZs are defined are provided in the next section.

[7]We do not have full coverage of each CZ in the data. On average, the counties in the LEHD cover about 62% of the population of the CZs included in the dataset. Once a CZ enters the regression sample, we do not add counties to the CZ, even if they become available in the LEHD in later years. This avoids inflating the net employment growth from one year to the next by including new counties in a CZ that were not present before. For more detailed explanation of our procedures to clean the QWI data, please refer to the data appendix of the paper.

The analysis focuses on firms in the non-tradable sector, namely Retail Trade (2-digit NAICS 44-45), and Accommodation and Food Services (2-digit NAICS 72). This definition matches the definition of non-tradable industries in Mian and Sufi (2012) as closely as possible given that the LEHD data is not broken down by 4-digit NAICS industries.[8]

Net job creation data is constructed from the raw LEHD dataset by exploiting the mechanical transition of firms across firm age categories. Specifically, the firms in the "start-up" category (0-1 year-olds) in year $t-2$ are the same firms in the 2-3 year-old category at t, conditional on having survived that far. The difference in the total number of jobs in these categories at $t-2$ and t represents the net job creation by these firms over the two years (including the effect of firms that disappear). Firms in the "2-3 year-old" category at $t-2$ move into the "4-5 year-old" category at t. Finally, firms in the "4-5 year-old", "6-10 year-old" and "11+ year-old" categories combined at $t-2$ will be the firms in the "6-10 year-old" and "11+ year-old" categories at t. The category "0-1 year olds" at time t includes firms that did not exist as of $t-2$ and this is our measure of job creation by newly formed firms over the 2 year period. [9] By exploiting these transitions of firms across age bins, we can calculate the net job creation over each 2-year period in each CZ in the non-tradable sector for 4 firm age categories—start-ups (0-1 year-olds), 2-3 year-olds, 4-5 year-olds and 6+ year-olds. Given the age bins provided in the QWI, the shortest time window we can use is two years, and the longest is 6 years (which we use in Section 3.3).

Table 1 summarizes the 2-year net job creation for each firm age category. Panel A shows that, on average, 611 jobs are created in each CZ's non-tradable sector over each 2-year period. The youngest firms (0-1 year-olds) create 2,365 jobs on average, while job losses occur on average in all other age categories. Old firms shed -1,045 jobs every 2 years

[8] As a robustness check, in Table A6 we perform our analysis on the age-sorted commuting zone-level employment for all industries in the LEHD and get qualitatively similar and quantitatively close results.

[9] There is some room for debate about what constitutes a "new firm" or a "start-up". First, the data classifies subsidiaries of existing firms as start-ups, as long as they are separate legal entities. Second, a new McDonald's franchisee opening her first McDonald's location is also classified as a startup. Ideally, we would like to run our tests excluding these firms, but we are constrained by what the Census makes available. We are not aware of any dataset that would allow researchers to fully capture these sources of potential misclassification in the setting of young private firms (including the confidential version of the LEHD, or even confidential IRS data).

on average, and they were hit particularly hard in the recession in the early 2000's. Panel B reports the population-weighted 2-year job creation by commuting zone and year and shows similar patterns.

2.2 Commuting Zones

In order to understand how young and old firms increase employment in response to exogenous shocks to local investment opportunities, we have to define a geographic unit of observation in a way that appropriately reflects the relevant constraints on labor mobility. Although county-level data are often used in analyses like ours, there is no obvious reason to believe that county lines constrain labor mobility. As Tolbert and Sizer (1996) point out: "A local economy and its labor market are bounded not by the nearest county line, but by interrelationships between buyers and sellers of labor."

A unit of observation in our analysis is, therefore, a commuting zone (CZ), developed by the Department of Agriculture for the purposes of delineating the local labor market and economy.[10] Recent labor market research uses CZs widely as the unit of observation (e.g., Autor et al. (2013)). There are 709 commuting zones covering the entire United States.[11] Each CZ aggregates an average of five counties or county equivalents, and is defined by the ability of a worker living in that region to transit easily somewhere else in that region for employment.

Commuting zones even span state boundaries in some cases. For example, consider the commuting zone for Charlotte, NC. This city sits on the boundary between North and South Carolina. The CZ for Charlotte includes adjoining counties in South Carolina (like York County) that are conveniently connected by major highways and are important suburban areas for the city, but does not include certain adjacent counties in North Carolina (like Gaston County) which are less economically connected to the regional hub. Thus, CZs are designed to account for meaningful economic boundaries, regardless of the municipal and

[10] For a comprehensive introduction to commuting zones, please refer to Tolbert and Sizer (1996).

[11] Indeed, one major advantage of using CZs is that, in contrast to MSAs, CZs cover all the counties in the United States.

regional political boundaries involved.

Table 2 reports summary statistics for commuting zone classifications. We include only the 507 CZs covered by our main job creation data (described below) in the summary. As of the 2000 Census, about 460,000 residents lived in a CZ on average (the median was 161,132 residents). The two-year growth rate in income (a key measure of demand/investment opportunities that we use below) ranges from 0% at the 25th percentile to 5% for the 75th percentile.

Using commuting zones is important for the interpretation of our findings because it allows us to control for economically meaningful substitution across alternative employment classifications. For example, one concern with county data might be that a person who loses a job in county X takes up a job requiring similar skills in an adjacent county, thereby smearing the county-level measures of net job creation. This is much less likely to be a concern at the CZ level, because it is explicitly defined in a way that encompasses relevant spans of labor market substitution.[12] This helps us guard against alternative explanations for our results.

2.3 Empirical Strategy

The question we are interested in is how changes in investment opportunities affect employment growth for firms in different age categories. We use the 2-year growth rate of total income in a commuting zone as our measure of changes in investment opportunities for the local non-tradable sector. Given that firms in this sector depend primarily on local demand, higher local income creates more opportunities for those businesses. We use a 2-year growth rate to be consistent with the 2-year net job creation data described above.

We instrument for changes in local (CZ) income following Bartik (1991) and Blanchard and Katz (1992). We need an instrument for this analysis because income growth is endogenously determined by the local economy, in particular by local labor market conditions

[12]Nevertheless, our results are robust to using county-level observations instead of commuting zone observations. These tables are included in the Appendix.

and by the behavior of local firms. In order to construct the instrument we use County Business Pattern (CBP) data published by the Census that includes total employment for each 4-digit NAICS industry at the county and year level. We start by calculating the nationwide employment growth in each 4-digit NAICS industry in the manufacturing sector (codes between 3100 and 3399). We then create a "predicted" local growth in manufacturing employment by multiplying the national growth rate in each 4-digit NAICS industry by the local manufacturing sector composition at the beginning of the period. Income data comes from the IRS Statistics of Income Division. We use county-level "total wages and salaries" (deflated to 2007 USD) as the main income measure, although the results are essentially identical, both quantitatively and qualitatively, if we use "total adjusted gross income". The results are also robust to using changes in per-capita income (results in the Appendix).

Formally, the instrumental variable (IV) we use is given by:

$$\text{Bartik IV}_i = \sum_j \omega_{ij} e_j \tag{1}$$

where the magnitude of the shock for CZ i is the national change in employment in sector j, denoted e_j, weighted by region i's ratio of jobs in that manufacturing sub-sector to overall employment, ω_{ij}. As shown in Table 2, this instrument ranges from 2% in the 25th percentile to 0 in the 75th percentile, this is reasonable considering the overall downward trend in the manufacturing sector in the U.S. The degree of CZ income growth explained by the CZ-specific sector composition of manufacturing employment is our instrument for the income growth in a CZ. Specifically,

$$\Delta I_{i,t-2\to t} = \pi_0 + \pi_1 \times \text{Bartik IV}_{i,t-2\to t} + \pi_3 \times \text{Controls}_{i,2000} + \eta_{i,t}, \tag{2}$$

$$\Delta e_{i,t-2\to t} = \alpha + \beta \times \widehat{\Delta I}_{i,t-2\to t} + \gamma \times \text{Controls}_{i,2000} + \varepsilon_{i,t}. \tag{3}$$

The controls $Controls_{i,2000}$ used in the regressions are drawn from the 2000 Census and the U.S. Bureau of Labor Statistics (BLS), and they are invariant over time. These CZ demographics include the logarithm of the total number of residents in the labor force, the

percentage of the population with at least a high school degree, and the logarithm of the total income in the county as of 2000.

This instrumental variables strategy has been widely used in finance and economics (see, e.g., Bound and Holzer (2000); Gallin (2004); Saks and Wozniak (2011); or Charles et al. (2013). Imai and Takarabe (2011), use this approach on Japanese data.) The exclusion restriction rests on the fact that the composition of the manufacturing sector is predetermined at the time of the income shock, and that nationwide shocks are exogenous to each individual CZ or county. In terms of relevance, we show below that this instrument is strongly related to local income shocks. In a separate set of regressions, we use the change in import penetration from China by industry (e_j in Equation (1)) as the aggregate shock to each region. The results, shown in the Appendix, are very similar to our main regressions.

In a 2-period setting and without the county-level controls, the above empirical strategy is the same as running a regression of scaled non-tradable employment on the logarithm of income with CZ fixed effects to control for all time invariant characteristics at the CZ level. This is precisely the setup in Autor et al. (2013), and we also use a 2-period setup (growth between 2001 and 2007) when we consider long term effects (Section 3.3 below). In the presence of multiple two-year periods as in our main specification, this regression is equivalent to flexibly controlling for CZ level effects.

We perform the above empirical strategy on both the totals by CZ and separately for the subsamples of start-ups (0-1 year-olds), 2-3 year-olds, 4-5 year-olds and 6+ year-olds (age measured at the end of year t). Our main findings rely on comparing the β estimates from these age-sorted subsamples. A higher β indicates a higher sensitivity to the shocks to investment opportunities. In the Appendix, we also show a "stacked" version of this equation, where we include indicator variables for each age category, as well as interactions of the income growth variable with the age dummies.

We focus on the sample period between 2000 and 2007. The reason for ending in 2007 is to avoid having our estimates confounded by the financial crisis. We start in 2000 because of the limited geographic coverage of the LEHD dataset before that (as discussed above).

Given that both our dependent and independent variables are measured over 2-year periods, our main sample is a "*non-overlapping*" sample, i.e. we only keep observations every two years (2001, 2003, 2005 and 2007). This ensures that we minimize the potential correlation within a region in consecutive years. As robustness checks, we also perform the analysis on an "*overlapping*" sample, where all years between 2000 and 2007 are kept in the sample. All standard errors are clustered at the CZ level.

3 Main Results

3.1 Firm age, investment opportunities and job creation

The main test of the response of firms in different age categories to shocks to investment opportunities is shown in Table 3, where we run a 2SLS regression (Equation (3)) of the scaled 2-year job creation on 2-year regional income growth and demographic characteristics as of 2000, the first year of the sample. The instrument for local income growth, as defined in Equation (1), is the nationwide growth of employment in each 4-digit manufacturing industry weighted by the preexisting regional composition of the manufacturing sector. Panel A reports results from our main regression sample (2001, 2003, 2005 and 2007, the "*non-overlapping*" sample described above). Column (1) of Table 3 shows the first stage result (specified in Equation (2)), where regress the regional income growth on the Bartik instrument. The coefficient of 1.038 means that one standard deviation increase in the instrument is associated with an 6.23% increase in 2-year income growth (this is 200% of the average 2-year income growth as reported in Table 2). The F-statistic of this first stage regression is 45.88, well above the conventional threshold of 10 for weak instruments (Stock and Yogo, 2005). This first stage result is consistent with earlier literature that shows that the nationwide manufacturing shock is transferred to the regional level and in turn can affect the local economy.

In Column (2), we run an OLS regression of job creation on income growth. The dependent variable is the 2-year job creation for all firms in the non-tradable sector, scaled

by the total non-tradable sector employment of 2000. The main explanatory variable is the 2-year local income growth in the same period, without instrumenting. The OLS regression shows that the raw correlation between net employment growth and local income is, as one would expect, very strong. This regression suffers from significant reverse causality problems, however, as employment growth mechanically makes total income of an area go up. Column (3) is the 2SLS version of Column (2), where income growth is instrumented using the Bartik IV for the same period. The causal effect of income growth on job creation in the non-tradable sector is strongly positive and 31% larger (0.339/0.259) than the OLS estimate. The remaining columns identify the firms that are mostly responsible for this strong positive relation between jobs in the non-tradable sector and local income growth.

Columns (4) and (5) estimate the same regressions as (2) and (3), but only examine job creation from the youngest firms (0-1 year-olds). The coefficient of 0.222 in column (5) means that a one standard deviation change in the local income growth leads to 497 more jobs created in the youngest firms (or about 21% more jobs created in the non-tradable sector in the CZ, compared to the average net employment growth of 2,365). Comparing 0.222 with the point estimate in column (3) of 0.339 tells us that young firms are responsible for 65.4% of the net employment growth in response to changing investment opportunities at a CZ level, even though young firms represent only 6% of the total sectoral employment (as reported in Table 2).

Columns (6) through (11) consider the response of 2-3 year-old, 4-5 year-old and 6+ year-old firms to total CZ income shocks. Columns (6) through (9) show that middle-aged firms (2-5 year-olds) in the non-tradable sector are fairly unresponsive to shocks to local income. The point estimates show an economically small negative coefficient (a one standard deviation change in income leads to a drop in employment of 166 and 16 employees for 2-3 year-old and 4-5 year-old firms, respectively). Columns (10) and (11) complete the picture by showing the positive response of old firms (6+ year-olds) to local economic conditions. The marginal significant coefficient of 0.197 translates to the creation of 441 jobs (88% of the responsiveness of the youngest firms). The effect for firms over 6 years old is generally smaller

than that of new firms, and we should note that, on average, the oldest firms represent over 80 percent of employment in a CZ (see Table 2).

In terms of our control variables, our proxy of the potential number of workers, measured as the logarithm of the total number of individuals in the labor force, is positively related to the job creation in the youngest firms. The regional income level as of 2000 is also negatively related to the activities of the youngest firms. We observe opposite effects for the oldest firm category.

Panel B of Table 3 repeats the analysis in Panel A using the overlapping sample (2000 to 2007).[13] The results produced from this bigger sample are similar to those using the non-overlapping sample, with a larger difference between the coefficients of the youngest and oldest firms. The coefficient of local income growth on young firm job creation, estimated in column (5) of Panel B, is 0.259, which implies that a one standard deviation increase in the income growth will bring 580 new jobs in start-ups in the non-tradable section per CZ. The effect for firms over 6 years old is indistinguishable from 0.

3.2 High and Low Investment Opportunities

One question that arises from the results above is whether the responsiveness of young and old firms is symmetric for positive and negative local income shocks. In particular, the results could be showing that young firms destroy more jobs in bad times, rather than creating more jobs in good times, or vice versa. This section shows that young firms are responsible for most of the job creation when investment opportunities are higher, and that they are less sensitive to local downturns.

To explore this idea, we first split the sample into "good times" and "bad times" based on the level of two-year real income growth. We label "good times" as those periods in which income growth is at the top tercile in the sample, and "bad times" as those periods in the

[13]Clustering at the CZ level should largely account for the correlation in standard errors due to the overlapping nature of the sample (we have to measure employment creation over 2-year periods because of the way the QWI data is set up). Still, our main sample only uses non-overlapping observations to avoid this problem.

bottom income growth tercile. Then we explore the differential responsiveness of young and old firms across different growth regimes.

Table 4 presents the findings. Panel A focuses on good times. The result is both qualitatively and quantitatively similar to Table 3. The point estimates for young firms translate into 755 new jobs per commuting zone for a one standard deviation change in income. Firms in other age categories are much less sensitive to these increased investment opportunities, and in particular the effects for firms that are over 6 years old are both economically small and statistically insignificant.

3.3 Medium Term Effects

One concern with the analysis above is that the Bartik instrument may be more suited for longer term analysis, given that local manufacturing employment may take longer than 2 years to fully adjust to nationwide shocks to manufacturing. To address this issue, in this section we use a longer time window of six years and compare the responsiveness of all firms created over a six year period to that of all other firms that already existed in a CZ.[14] In this test we use the cross-section of all CZs as of 2007, and consider the net job creation in non-tradable firms during the period between 2001 and 2007. We instrument for the growth in income with the 6-year predicted change in employment in the manufacturing sector for the CZ.

One of the additional advantages of the longer 6 year time window is that this coincides with the accession of China to the WTO and the significant shock to US manufacturing caused by this event. As Autor et al. (2013) show, rising Chinese import competition led to higher unemployment and lower labor force participation in CZs that were most affected by this shock. Consistent with this intuition, in the appendix we show that the results are unchanged qualitatively and quantitatively if we replace the Bartik shock with the change in Chinese import penetration by 4-digit NAICS industry.

[14] Our choice of a six year period is driven by the need to match the age bins provided by the QWI. Two years and six years are the only two time windows that allow us to cleanly measure employment creation of firms of different ages.

Table 5 shows a very similar pattern to what we observe in Table 3. We again see a very strong response from the youngest firm category (in this case, those 5 years of age or younger), and a response from the older firms that is statistically indistinguishable from zero. Based on Table 5, over a long period of time, new jobs are created and accumulated in the younger firms while older firms are relatively unresponsive to the shocks.

4 Financing Constraints And Startup Job Creation

The evidence thus far clearly favors the hypothesis that young firms are more responsive to local income shocks. However, it is far from obvious that this should be the case in the non-tradable sector, where technological advantage is less important and young firms are likely to face more severe financing constraints than older, more established firms (Evans and Jovanovic, 1989; Cagetti and De Nardi, 2006; Lelarge et al., 2010; Adelino et al., 2013; Schmalz et al., 2013). Even though startups are more responsive, it could still be the case that financing constraints create economically meaningful barriers preventing them from taking advantage of changing opportunities. In this section we explore this in greater detail.

To study how access to finance interacts with firms' ability to pursue investment opportunities, we use the share of local banks in a CZ as a measure of local access to finance. We use the Summary of Deposits (SoD) data from the Federal Deposit Insurance Corporation (FDIC) to compute the share of a bank's deposits that are located in a CZ. A "local" bank is defined as one that has 75% or more deposits concentrated in one CZ (following Cortes (2013)). We then construct the local bank share of a CZ, defined as the share of all deposits in a CZ that are held by local banks. The identifying assumption is that, as shown by Petersen and Rajan (1994, 2002), small (local) banks are more likely to be able to lend to small firms, and especially so to more opaque firms. Lending to old (established) firms is likely to require less screening and monitoring than lending to new firms in an area, so young firms in CZs with a higher proportion of local banks are likely to have better access to financing. In order to mitigate the effect of labor market dynamics on the evolution of the local banking

sector, we use a time-invariant CZ-level measure by calculating the time-series median of the deposit concentration in local banks for each CZ. As shown in Table 2, the share of deposits held by local banks account, on average, for 31% of all CZ deposits.

In order to confirm that local banking is important to startups, Table 6 performs a simple OLS regression to correlate the employment in young and old firms with the share of local banks. The dependent variable is the time-series median of the share of CZ employment in 0-1 year-old firms (column (1)) and in 6+ year-old firms (column (2)). The independent variables are the time-series median of the local bank share and demographic covariates. Consistent with the literature (e.g., Guiso et al., 2004), we find that the strength of local banks in an area is positively correlated with the share of employment in young firms (parameter estimate is 0.017) and negatively correlated with the share of employment in old firms (estimate is -0.037). This is consistent with the share of deposits held by local banks indeed capturing the ease of access to finance by young firms.

To identify the effect of access to bank financing on firms' ability to capture local investment opportunities, we introduce the local bank share into the specifications by adding the main effect of this measure and its interaction with the instrumented income growth. For interpretation purposes, we incorporate this measure as an indicator variable, where $I_{High\ LB,i}$ is equal to 1 if commuting zone i's long-term median of the share of local banks is higher than the median share of all CZs. Specifically, in the second stage of the 2SLS regressions, we modify (3) to

$$\begin{aligned}\Delta e_{i,t-2\to t} = \alpha &+ \beta \times \widehat{\Delta I_{i,t-2\to t}} \\ &+ \beta' \times \widehat{\Delta I_{i,t-2\to t}} \times I_{High\ LB,i} \\ &+ \gamma \times \text{Controls}_{i,2000} + \gamma' \times I_{High\ LB,i} + u_i + \varepsilon_{i,t}.\end{aligned} \tag{4}$$

β' is the coefficient of interest in this section, and it can be interpreted as the "additional" responsiveness to local investment opportunities of firms in areas with easier access to finance relative to those in areas with worse access to bank finance.

Table 7 reports the estimation results of Equation (4) for firms of different ages. Col-

umn (3) shows the regression for the startups. The responsiveness to the income growth is 0.132 for startups. If the CZ is an area with a high share of deposits in local banks, the responsiveness of the startups increases to 0.311 (0.132+0.179)—more than doubling the initial responsiveness. Interestingly, the responsiveness of the old firms decreases in areas with high share of local banks. This suggests that in areas with easier access to credit for young businesses, the heightened responsiveness of young firms perhaps even crowds out the response of mature firms.

5 Are Collateral Effects Driving Our Results?

One of the prominent features of the time period we consider is the nation-wide increase in house prices in the US between 2000 and 2007. Given that our instrument may also affect demand for housing (through migration, for example), it is important to explore the implications of changing house prices for our results. There are two possible channels through which a shock to demand for housing (and higher prices) could impact our analysis. First, previous work has argued that the increase in house prices had implications for demand in the non-tradable sector (Mian and Sufi, 2011, 2012). This mechanism by itself would, however, have no significant implications for our analysis, as it would simply amplify the fact that non-tradable businesses faced higher demand in places with higher values of the Bartik instrument. The second channel by which housing could affect our results is emphasized in recent work by Adelino et al. (2013) who argue that the increase in house prices also led to easier access to collateral for entrepreneurs, and this led to an increase in employment in firms under 20 employees. This implies that our results could reflect easier financing on the part of firms, and not differential ability to pursue investment opportunities.

We should first note that, by looking at the non-tradable sector, our empirical design minimizes the relative contribution of the collateral channel. There are several mechanisms at work here. First, in the tradable sector, demand is much more highly impacted by non-local shocks, thus the impact of housing prices on output in the tradable sector is much more

likely to be coming from a collateral channel. In contrast the non-tradable sector faces demand shocks that only stem from changing local conditions. Thus, the relative contribution of the collateral channel is minimized in this sector. Second, the startup capital requirements in restaurants and retail establishments are large (Adelino et al, 2013): the inventory requirements in retail and the kitchen up-fit costs associated with starting a restaurant place the non-tradable sector above the median in Adelino et al (2013) in terms of the startup capital requirements. Nevertheless, in spite of these two mechanisms, it is possible that the response we observe on the part of young firms might be significantly affected by the value of residential or commercial real estate collateral, and that removig this effect would alter our conclusions.

In order to directly test the impact of changing house prices on the responsiveness of firms to the Bartik shock we split the sample of CZs into areas that experience high and low house price appreciation during the sample period. Consistent with our interpretation of the main results, the responsiveness of young firms to shocks to investment opportunities is very similar across the two subsamples. This suggests that our instrument affects employment creation in firms of this age through shocks to local income, and not due to shocks to housing demand. Because house prices could themselves be endogenous to employment creation at young and old firms, we also split the sample into high and low elasticity areas as defined by the Saiz (2010) housing elasticity measure.[15] We again find that the results for young firm responsiveness are large, statistically significant, and unchanged in the two subsamples. Old firms have smaller point estimates in both subsamples than startups and, as in the main regressions, the estimates for these firms are more noisily measured.

In sum, there are strong reasons a priori to expect that the collateral channel is weak in the empirical setting we have constructed. In line with these expectations, we find equally strong effects in regions with high and low exposure to the collateral channel. This indicates that

[15]The Saiz (2010) housing supply elasticity measure includes a geographic and regulatory component that are meant to capture the relative ease with which the housing stock in an area can adjust to a positive shift in the demand for housing. Areas where is it relatively easy to build tend to see more construction (and smaller house price increases) when demand for housing increases, whereas low elasticity areas (those where it is hard to build) tend to see higher prices and lower levels of new construction.

our results are being driven by demand-side considerations rather than through a collateral channel.

6 Firm Age, Firm Size, and Job Creation

The empirical strategy in the preceding sections establishes a causal link between economic shocks and job creation by instrumenting for local economic shocks with pre-existing manufacturing industrial structures and focusing specifically on the non-tradables sector to isolate the resulting job creation to that which can plausibly be attributed back to the local economic shock. While this strategy has the advantage of offering a clean causal linkage between economic shocks and job creation across the firm age distribution, it leaves a number of questions unanswered. For one, startups are often thought to be nimbler than older firms, especially in terms of their ability to seize on disruptive innovations—the non-tradables sector is not typically thought of as one characterized by rapid technological disruption, nor is it one in which highly skilled labor plays a critical role. Also, at an empirical level, the QWI data we have used thus far does not allow us to compare firms of different sizes, and much of the previous literature has emphasized the role of firm size in employment creation.

In this section we attempt bridge this gap by extending our analysis to firms of different sizes as well as ages. To do this, we depart from the preceding analysis and turn to data from the US Census Business Dynamics Statistics. This dataset differs in some important ways from the one constructed for the previous analysis. First, it contains Metropolitan Statistical Area (MSA)-level data, not commuting zone or county-level data. This means that we have a much less complete picture of aggregate employment here than before. In addition, it does not include a breakdown by sector at this level of geographic disaggregation. We cannot, therefore, consider the effect of the shock on different sectors in isolation; instead we must lump tradable and non-tradables together. It does, however, contain age and size breakdowns instead of just age classifications.[16] This allows us to extend our analysis along

[16]The BDS data provides detailed age data for firms aged 0, 1, 2, 3, 4, 5, 6-10, 11-15, 16-20, 21-25, 26+ years. The size is categorized by the number of employees, and the bins used in this dataset are 1-4, 5-9,

the lines of Haltiwanger et al (2013) by examining employment responsiveness across the joint distribution of size and age.

Notwithstanding these caveats, we proceed exactly as we have above, first repeating the same regressions as before, using the same Bartik manufacturing instrument for local investment opportunities, to confirm that our findings extend to job creation in all sectors (not just non-tradables).[17] Then we use the instrumented income growth in second-stage regressions in which we relate *overall* employment growth to income growth, breaking out the results by size and age categories.

The results are reported in Table 9. For brevity, we have reported only the point estimates from the second stage regression on the main variable of interest, instrumented income growth. The table shows the results of the breakdown of the age categories into three size bins: firms with fewer than 20 employees, those with more than 20 and fewer than 100 employees, and those with more than 100 employees.

We find that the responsiveness of young firms comes almost exclusively from small firms (with fewer than 20 employees), whereas the responsiveness of older firms comes from those with more than 100 employees. The lack of responsiveness of firms aged 2 to 5 years is present across all size categories. Interestingly, small firms aged 2 years or more all seem to lose jobs when income rises, potentially pointing to a crowding out effect of young firms relative to older ones.

Although the point estimates are not immediately comparable to those from the preceding sections, the results of this section reinforce and amplify our previous results. In particular, the findings in this table support the notion that some unobserved firm characteristics that are proxied by firm age correlate with job creation: young firms that possess

10-19, 20-49, 50-99,100-249, 250-499, 500-999, 1,000-2,499, 2,500-4,999, 5,000-9,999, and 10,000+ employees. For consistency with our analysis using QWI data, we aggregate the data into the four age categories 0-1, 2-3, 4-5 and 6+; we aggregate size categories into firms with fewer than 20 employees, 20-100 employees and more than 100 employees.

[17] We should emphasize that, by construction, our experiment is most applicable to the "purely" non-tradable industries (NAICS sectors 44-45 and 72), but the other sectors in the economy should also respond to changes in local income (in particular firms that are in any of the services sectors). Table A6 in the appendix shows that the results are very consistent when we perform our analysis using the QWI data for all sectors (rather than just the non-tradable industries) and the BDS data.

these characteristics grow and thrive, becoming larger, older firms that continue to respond to changing economic conditions. Firms that lack these characteristics languish. This perspective is consistent both with Puri and Zarutskie (2012), whose focus is on venture- versus non-venture-backed firms but who show that a tiny fraction of new firm starts are responsible for a large fraction of overall employment, and Hurst and Pugsley (2011), who conversely show that a large number of small businesses simply have no desire to grow.

7 Conclusion

Understanding the mechanics of job creation has become a central objective for academic researchers, politicians and policy makers alike, especially in the wake of the financial crisis and ensuing economic recession of 2007-2009. This paper adds to this important discussion by studying how firm age impacts the responsiveness of firms to economic shocks.

The deep interconnections between job creation and economic growth make it empirically challenging to identify causal linkages between economic shocks, startup activity and net job creation. In this paper we identify the link between economic shocks and job creation by focusing primarily on firms in the non-tradable sector, and asking how net job growth in this sector responds to exogenous shocks to the local manufacturing sector. This empirical design allows us to test a geographically segmented version of q-theory. The thought experiment is as follows: when income from the local manufacturing sector changes unexpectedly, this ripples through the local economy, causing retail stores, restaurants, and local service organizations to expand or contract in response to the shock.

The central question is who responds more: young firms or old firms? This question pits two competing hypotheses about job creation against one another. The first is that young firms, for a variety of reasons related to organizational flexibility, incentives and scale find it easier to identify and exploit economic opportunities that arise in their local environment. The opposing hypothesis is that older organizations, because they can more readily access capital markets or because they understand local markets better, respond more quickly to

economic shocks.

Our results favor the first hypothesis: young firms respond more. Young firms not only create more jobs on average in the non-tradables sector, they are also more responsive to economic shocks than more mature firms. Of course, being more responsive means that they create more jobs in good times, but they create much less in bad times. At the same time, their responsiveness is weaker in areas in which the local banking sector is less favorable towards small business lending. This indicates that indeed, access to capital impedes the responsiveness of young firms to changes in business conditions.

These findings open the door to many fruitful questions. They speak directly to current policy proposals aimed at stimulating job creation by stimulating access to capital in the small business center. Here, our results would offer guarded support for such policies. On the one hand, the fact that startups in regions with easier access to credit are about twice as responsive to economic shocks as ones in other regions suggests that alleviating financing constraints is indeed important for job creation. At the same time, our results highlight the distinction between young firms and small firms: most young firms are small, but most small firms are old, and our results illustrate that the responsiveness is concentrated in young businesses, not small ones. Our emphasis on young, as opposed to small firms, suggests that policies aimed at alleviating constraints to startup activity is likely to be more effective as a tool for job creation than broader policies targeted at the small business sector.

Why are startups so much more responsive to local economic shocks than older firms, especially in the non-tradable sector, where the widely touted technological and innovative advantages of startups are probably unlikely to be important? Ultimately this question is beyond the scope of this paper, but the question suggests that factors such as bureaucratic inflexibility and the strength of incentives play an important role even in less technologically sophisticated sectors. This is an important and ongoing research question in the economics of productivity, organizations and management (see (Bloom et al., 2013; Bloom and Van Reenen, 2007)). Clearly, understanding the organizational advantages that young firms inherently have over older firms is essential for understanding the micro foundations

of their increased sensitivity to changing economic conditions.

In a similar vein, it is natural to ask how our results extend beyond the non-tradable sector. Although we have taken first steps in this direction, much more work needs to be done. How does the level of human capital in a sector correlate with the responsiveness of startups to economic conditions? Or to put it more simply, do startups create *good* jobs or just ordinary jobs? Moreover, how do the relative importance of different factors such as organizational flexibility, innovation, and incentives contribute to different levels of responsiveness in different industry contexts? We leave these questions for future research.

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Table 1: Job Creation and Firm Age (Non-Tradable Sector)

This table summarizes the 2-year job creation in the non-tradable sector (NAICS2= 44, 45, 72) in a commuting zone, sorted by firm age. The data is extracted from the QWI data published by the LEHD program in Census, and is calculated by exploiting the mechanical transition of firms across firm age categories (details in Section 2). Panel A reports the average number of jobs created by CZ in each age category and year, and Panel B shows the average net job creation by CZ and year scaled by the total employment in the non-tradable sector in the CZ as of 2000.

Panel A: Commuting Zone Level, Raw Job Creation						
Year	N	0-1 yrs	2-3 yrs	4-5 yrs	6+ yrs	Total
1999	250	2865.12	-457.42	-253.54	-669.63	1484.81
2000	350	2434.74	-426.04	-187.59	-194.49	1626.66
2001	368	2051.27	-510.36	-289.43	-1991.84	-740.52
2002	431	2299.21	-598.25	-406.36	-2611.80	-1317.20
2003	470	2232.23	-332.90	-304.50	-746.99	847.92
2004	484	2364.33	-381.62	-206.74	-650.28	1125.63
2005	498	2307.62	-381.55	-197.59	-867.46	861.02
2006	506	2408.26	-493.16	-262.50	-839.81	812.67
2007	507	2326.47	-470.07	-227.61	-831.83	796.84
Average		2365.47	-450.15	-259.54	-1044.90	610.87

Panel B: Commuting Zone Level, Scaled by 2000 Employment						
Year	N	0-1 yrs	2-3 yrs	4-5 yrs	6+ yrs	Total
1999	250	7.77%	-1.49%	-0.66%	-1.83%	3.78%
2000	350	7.03%	-1.34%	-0.76%	-1.94%	2.98%
2001	368	6.53%	-1.38%	-0.85%	-6.78%	-2.48%
2002	431	6.17%	-1.52%	-0.99%	-5.88%	-2.22%
2003	470	6.09%	-1.19%	-1.05%	-2.19%	1.66%
2004	484	6.19%	-1.02%	-0.67%	-2.48%	2.02%
2005	498	6.47%	-1.12%	-0.72%	-3.20%	1.42%
2006	506	6.56%	-1.26%	-0.81%	-3.03%	1.46%
2007	507	6.21%	-1.31%	-0.80%	-2.80%	1.30%
Average		6.56%	-1.29%	-0.81%	-3.35%	1.10%

Table 2: Summary Statistics for Commuting Zones (1999 to 2007)

This table reports the summary statistics for all Commuting Zone-Year observations in our sample, from 1999 to 2007. For each variable, we show the pooled average, standard deviation, 25th, 50th and 75th percentiles. We use the 2000 Department of Agriculture definition of Commuting Zones (CZs). Income in a CZ is defined as the total CZ wages and salaries, extracted from the county-level IRS Statistics of Income. Population, number of households, and the percentage of 25yr+ with a high school (bachelor's) degree are all obtained from the 2000 Census and aggregated from the county-level to the CZ-level. Total Labor Force is obtained from the Bureau of Labor Statistics. Banking Sector variables are calculated from the FDIC Summary of Deposits. HHI is the CZ-level Herfindahl index of the banking sector, calculated using the shares of deposits, % of Large Banks is the percentage of the CZ deposits concentrated in Top 30 largest US banks. % of Local Banks is the percentage of deposits concentrated in "local" banks (defined in detail in the Section 2). Non-tradable Employment is calculated from the QWI data published by the LEHD program in Census. Non-tradable sector includes 2-digit NAICS 44-45 (Retail Trade) and 2-digit NAICS 72 (Accommodation and Food Services).

	N	Mean	Std.Dev	p25	p50	p75
Number of Counties in the Commuting Zone	3864	4.92	2.38	3	5	6
2yr Income Growth (Total Wages)	3864	0.03	0.06	0	0.02	0.05
Manuf. Employment Bartik	3335	-0.01	0.01	-0.02	-0.01	0
Population as of 2000	3864	460883	982973	79924	161132	407788
Total Labor Force	3864	235123	502726	38044	78646	202946
Household as of 2000	3864	174336	358401	30443	60477	154221
% of 25yr+ with High School Degree	3864	79.41	7.15	74.86	80.97	84.44
% of 25yr+ with Bachelor's Degree	3864	18.94	6.42	14.32	17.55	22.16
Banking Sector HHI	3864	0.13	0.07	0.09	0.12	0.15
Banking Sector (% of Deposit from Large Banks)	3864	0.37	0.23	0.18	0.33	0.55
Banking Sector (% of Local Banks)	3864	0.31	0.18	0.18	0.3	0.44
Non-tradable Employment (Aggregate)	3864	37329	80920	3764	10248	30469
Non-tradable Employment (Startups)	3864	2343	5356	237	651	1887
Non-tradable Employment (2-3 year-olds)	3864	1870	4185	198	527	1538
Non-tradable Employment (4-5 year-olds)	3864	1595	3576	171	460	1331
Non-tradable Employment (6+ year-olds)	3864	31521	68091	3050	8610	25374

Table 3: Job Creation and Investment Opportunities

This table shows regressions of net employment creation at the commuting zone (CZ) level on local income growth. We run regressions for the aggregate change in employment and for the change in employment in each of the 4 age categories. Observations are at the CZ-year-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the 2-year growth of total wages and salaries in the CZ. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a CZ. Panel A performs the analysis on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the CZ on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (11) perform similar regressions as columns (2) and (3) for firms of different ages. Panel B repeats the analysis in Panel A on an "overlapping" sample between 2000 and 2007. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis and standard errors are clustered by CZ. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Panel A: Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.038***										
	(6.773)										
Income Growth		0.259***	0.339**	0.121***	0.222***	-0.003	-0.074**	-0.004	-0.007	0.145*	0.197
		(2.604)	(2.301)	(7.218)	(2.657)	(-0.452)	(-2.312)	(-0.578)	(-0.307)	(1.789)	(1.323)
ln(Total Laborforce)	-0.110***	-0.039**	-0.027	0.002	0.017	-0.002	-0.012**	0.001	0.000	-0.041**	-0.032
	(-5.403)	(-2.167)	(-1.155)	(0.221)	(1.204)	(-0.509)	(-2.150)	(0.429)	(0.118)	(-2.408)	(-1.385)
% Highschool Edu	-0.517**	-0.317	-0.283	0.664***	0.668***	-0.064	-0.082	-0.055	-0.039	-0.863***	-0.832***
	(-2.081)	(-1.517)	(-1.274)	(4.036)	(4.407)	(-1.216)	(-1.452)	(-1.640)	(-1.163)	(-4.692)	(-4.271)
ln(Total CZ Wages)	0.098***	0.036**	0.024	-0.000	-0.014	0.001	0.010**	-0.001	-0.001	0.036**	0.028
	(5.623)	(2.226)	(1.170)	(-0.055)	(-1.095)	(0.423)	(2.044)	(-0.550)	(-0.197)	(2.431)	(1.356)
Constant	1.231***	0.420**	0.309	-0.032	-0.193	0.014	0.126**	-0.013	-0.006	0.451**	0.381
	(5.681)	(2.139)	(1.207)	(-0.306)	(-1.249)	(0.351)	(2.032)	(-0.480)	(-0.149)	(2.493)	(1.506)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,700	1,843	1,700	1,843	1,700	1,843	1,700	1,843	1,700	1,843	1,700
R-squared	0.240	0.107	0.095	0.109	0.073	0.013	-0.055	0.011	0.010	0.075	0.069
F-Statistics	45.88										

Panel B: Overlapping Sample (2000 to 2007)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.003***										
	(6.557)										
Income Growth		0.197**	0.131	0.115***	0.259***	-0.006	-0.094***	-0.000	-0.009	0.089	-0.026
		(2.062)	(0.934)	(6.523)	(3.354)	(-1.127)	(-3.703)	(-0.049)	(-0.467)	(1.219)	(-0.186)
ln(Total Laborforce)	-0.121***	-0.041***	-0.041*	0.012	0.029*	-0.007*	-0.018***	-0.002	-0.002	-0.043***	-0.049**
	(-7.578)	(-2.796)	(-1.838)	(1.008)	(1.937)	(-1.844)	(-3.904)	(-0.721)	(-0.783)	(-2.778)	(-2.305)
% Highschool Edu	-0.546**	-0.421**	-0.340	0.704***	0.708***	-0.098**	-0.090*	-0.078***	-0.059**	-0.949***	-0.899***
	(-2.124)	(-2.112)	(-1.566)	(4.143)	(4.555)	(-2.181)	(-1.862)	(-2.770)	(-2.084)	(-5.379)	(-4.774)
ln(Total CZ Wages)	0.108***	0.037***	0.037*	-0.009	-0.024*	0.006*	0.015***	0.002	0.002	0.038***	0.044**
	(7.693)	(2.878)	(1.868)	(-0.879)	(-1.815)	(1.721)	(3.713)	(0.661)	(0.692)	(2.807)	(2.283)
Constant	1.357***	0.483***	0.469*	-0.131	-0.323**	0.077*	0.188***	0.021	0.025	0.516***	0.579**
	(7.727)	(3.010)	(1.940)	(-1.033)	(-1.979)	(1.742)	(3.736)	(0.728)	(0.751)	(3.055)	(2.486)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,335	3,864	3,335	3,864	3,335	3,864	3,335	3,864	3,335	3,864	3,335
R-squared	0.202	0.095	0.092	0.111	0.035	0.018	-0.107	0.019	0.018	0.062	0.058
F-Statistics	42.99										

Table 4: Job Creation and Investment Opportunities—Good and Bad Income Shocks

This table shows regressions of net employment creation at the commuting zone (CZ) level on both "good" and "bad" local income growth. Observations are at the CZ-year-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the 2-year growth of total wages and salaries in the CZ. "Good shocks" are shocks in the top tercile of real income growth, "bad" shocks are those in the bottom tercile of income growth. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a CZ. This analysis uses a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Panel A reports the results for CZ-year observations with a "good shock." Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the CZ on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (11) perform similar regressions as columns (2) and (3) for firms of different ages. Panel B repeats the analysis in Panel A on "bad" shocks. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis and standard errors are clustered by CZ. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Panel A: Good Shocks (Top Tercile Income Growth)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.507***										
	(4.313)										
Income Growth		0.134	0.423	0.113***	0.332**	-0.008	-0.002	-0.009	-0.021	0.038	0.112
		(1.309)	(1.351)	(5.491)	(2.229)	(-1.032)	(-0.024)	(-1.441)	(-0.317)	(0.477)	(0.365)
Constant	1.247***	0.368	0.155	0.012	-0.280	-0.028	0.013	-0.005	0.004	0.389	0.421
	(3.232)	(1.350)	(0.299)	(0.091)	(-1.166)	(-0.482)	(0.092)	(-0.121)	(0.044)	(1.611)	(0.892)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	562	614	562	614	562	614	562	614	562	614	562
R-squared	0.076	0.083	-0.004	0.131	-0.100	0.015	0.020	0.010	0.008	0.054	0.048
F-Statistics	18.6										

Panel B: Bad Shocks (Bottom Tercile Income Growth)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	0.165**										
	(1.970)										
Income Growth		0.530**	-0.868	0.018	0.717	0.058**	-0.443	0.007	0.042	0.447**	-1.190
		(2.450)	(-0.657)	(0.373)	(0.947)	(2.417)	(-1.291)	(0.348)	(0.188)	(2.283)	(-0.819)
Constant	-0.161	0.448	0.028	0.011	0.129	0.089	0.009	-0.075	-0.061	0.425	-0.049
	(-1.566)	(1.431)	(0.087)	(0.068)	(0.654)	(1.319)	(0.097)	(-1.419)	(-0.997)	(1.513)	(-0.155)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	572	615	572	615	572	615	572	615	572	615	572
R-squared	0.041	0.097	-0.027	0.048	-0.213	0.033	-0.676	0.015	0.006	0.088	-0.103
F-Statistics	4										

Table 5: Job Creation and Investment Opportunities—Long-term Analysis

This table shows regressions of long-term net employment creation at the commuting zone (CZ) level on long-term local income growth. Observations are at the CZ-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) between 2001 and 2007 in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the growth of total wages and salaries in the CZ between 2001 and 2007. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a CZ. Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the CZ on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (7) perform similar regressions as columns (2) and (3) for firms of different ages. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. Heteroskedasticity-robust t-statistics are shown in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Job Creation from 2001 to 2007		Aggregate		0-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	1st Stage	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.549***						
	(9.035)						
Income Growth		0.484***	0.382**	0.188***	0.293***	0.296***	0.090
		(7.162)	(2.094)	(4.654)	(2.813)	(4.914)	(0.510)
ln(Total Laborforce)	-0.342***	-0.034	-0.118	-0.002	0.025	-0.032	-0.143
	(-7.877)	(-0.747)	(-1.290)	(-0.080)	(0.499)	(-0.691)	(-1.522)
% Highschool Edu	-2.450***	-1.016	-1.168	1.643***	1.825***	-2.658***	-2.995***
	(-3.834)	(-1.607)	(-1.441)	(4.150)	(3.827)	(-4.592)	(-4.115)
ln(Total CZ Wages)	0.305***	0.036	0.110	0.005	-0.020	0.030	0.130
	(7.900)	(0.905)	(1.345)	(0.208)	(-0.456)	(0.760)	(1.549)
Constant	3.936***	0.449	1.362	0.003	-0.305	0.446	1.667
	(8.428)	(0.906)	(1.365)	(0.010)	(-0.552)	(0.902)	(1.639)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	404	489	404	489	404	489	404
R-squared	0.387	0.216	0.216	0.163	0.152	0.125	0.094
F-Statistics	81.64						

Table 6: Local Bank Share and Employment in Different-aged Firms

This table analyzes the relationship between the share of deposits held by "local banks" and the employment distribution across young and old firms. If 75% or more of a bank's deposits are concentrated in one CZ we define this bank as "local". The local bank share is the percentage of total deposits in a CZ held by "local" banks. In order to mitigate the effect of labor market dynamics on the evolution of the local banking sector, we calculate a time-invariant CZ-level measure—Local Bank Share—by calculating the time-series median of the share of local banks in the CZ. In column (1), the dependent variable is the time-series median level of the share of employment in firms < 1 year old in the CZ, and in column (2) the dependent variable is the time-series median level of employment share in firms > 6 years old. Control variables are extracted from the 2000 Census and BLS. Both regressions include state fixed-effects. Heteroskedasticity-robust t-statistics are in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

	(1) % of Firms < 1 Year Old	(2) % of Firms > 6 Years Old
% of Local Banks	0.017**	-0.037**
	(2.434)	(-2.313)
ln(Total Laborforce)	-0.022**	0.054*
	(-2.037)	(1.886)
% Highschool Edu	0.549**	-1.164*
	(2.348)	(-1.932)
ln(Total CZ Wages)	0.018*	-0.041
	(1.716)	(-1.551)
Constant	0.004	0.951***
	(0.179)	(15.285)
State FE	Yes	Yes
Number of CZs	507	507
R-squared	0.231	0.270

Table 7: Access to Finance and the Responsiveness to Investment Opportunities

This table shows regressions of net employment creation at the commuting zone (CZ) level on local income growth, an indicator for above median share of deposits held by local banks, and the interaction of the two variables. Local banks are defined as those with 75% or more of its deposits in one CZ. $I_{(High\ LB)}$ is a dummy variable equal to 1 if the CZ's local bank share is higher than the median of all CZs. Observations are at the CZ-year-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the 2-year growth of total wages and salaries in the CZ. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a CZ. The interaction term Income Growth $\times$ $I_{(High\ LB)}$ captures the role of local bank shares on the responsiveness of firms in creating jobs. Analysis is performed on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) to (6) are IV regression for different firm age categories. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis. Standard errors are clustered by CZ. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

		Aggregate	0-1 year-olds	2-3 year-olds	4-5 year-olds	6+ year-olds
	(1)	(2)	(3)	(4)	(5)	(6)
	1st Stage	IV	IV	IV	IV	IV
Manuf. Employment Bartik	1.225***					
	(5.606)					
Income Growth		0.326**	0.132	-0.070**	-0.000	0.264*
		(2.162)	(1.540)	(-2.384)	(-0.013)	(1.670)
Income Growth $\times$ $I_{(High\ LB)}$		-0.009	0.179**	-0.009	-0.013	-0.165
		(-0.053)	(2.065)	(-0.267)	(-0.462)	(-1.023)
$I_{(High\ LB)}$	-0.012***	-0.008	-0.009***	0.000	0.001	-0.001
	(-2.823)	(-1.535)	(-3.059)	(0.017)	(0.973)	(-0.131)
ln(Total Laborforce)	-0.106***	-0.027	0.013	-0.012**	0.001	-0.029
	(-5.209)	(-1.171)	(0.945)	(-2.209)	(0.188)	(-1.226)
% Highschool Edu	-0.512**	-0.297	0.635***	-0.081	-0.036	-0.816***
	(-2.098)	(-1.319)	(4.216)	(-1.445)	(-1.088)	(-4.135)
ln(Total CZ Wages)	0.094***	0.023	-0.011	0.010**	-0.001	0.025
	(5.398)	(1.173)	(-0.858)	(2.103)	(-0.260)	(1.192)
Constant	1.203***	0.312	-0.149	0.124**	-0.009	0.346
	(5.548)	(1.250)	(-0.950)	(2.084)	(-0.234)	(1.345)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,700	1,700	1,700	1,700	1,700	1,700
R-squared	0.247	0.101	0.089		0.009	0.062
F-Statistics	23.4					

Table 8: Job Creation and Investment Opportunities in High and Low House Price Appreciation Areas

This table shows regressions of net employment creation at the commuting zone (CZ) level on local income growth. Observations are at the CZ-year-firm age level. The analysis is performed in different subsamples with different local housing market condition during this period. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the 2-year growth of total wages and salaries in the CZ. We include the dummies for different firm ages and the interaction terms of age dummies with income growth, in order to capture the difference in responsiveness across different age categories. We instrument for income growth using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a CZ. We perform the analysis on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Local house price growth is the two-year house price index growth provided by Federal Housing Finance Agency; Saiz elasticity is provided by Saiz (2010) and it measures the geographic and regulatory constraints to the supply of housing in an area. The sample is categorized into "high" and "low" by the median of each variable. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics but omitted here for brevity. All regressions include year fixed effects. T-statistics are shown in parenthesis. Standard errors are clustered by CZ. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
	Aggregate	**0-1 yrs**	**2-3 years**	**4-5 years**	**6+ years**
	IV	IV	IV	IV	IV
High House Price Growth					
Income Growth	0.455***	0.283***	-0.075***	-0.031	0.277*
	(2.811)	(4.135)	(-2.708)	(-1.592)	(1.882)
Low House Price Growth					
Income Growth	0.201	0.344***	-0.020	-0.054	-0.069
	(1.406)	(4.190)	(-0.615)	(-1.583)	(-0.453)
Low Saiz Elasticity					
Income Growth	0.472***	0.284***	-0.053**	0.001	0.240
	(2.852)	(3.527)	(-2.298)	(0.065)	(1.522)
High Saiz Elasticity					
Income Growth	0.456***	0.314***	-0.024	-0.049*	0.215
	(3.639)	(3.952)	(-0.644)	(-1.690)	(1.556)

Table 9: Size and Age

This table summarizes the regressions of net employment creation by firm age and firm size at the MSA level using data from the Census Business Dynamics Statistics. The reported coefficients are from instrumental variables regressions of the change in employment in each of the 4 different age categories and 3 firm size categories on local income growth. Observations are at the MSA-year-firm age-firm size level. For each age-size pair, the dependent variable is the net change in employment in all the industries over the previous two years created in firms in each age-size bin, and this variable is scaled by the total employment in the MSA as of 2000. Income growth is the 2-year growth of total wages and salaries in the MSA. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in the MSA. The analysis is performed on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics (please see Table A7 for detailed coefficients). All regressions include year fixed effects. T-statistics are shown in parenthesis and standard errors are clustered by MSA. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

		Age				
		Aggregate	0-1 yrs	2-3 years	4-5 years	6+ years
Size	Aggregate	1.164***	0.404***	0.001	-0.015	0.774***
	<20	0.156***	0.316***	-0.061***	-0.032***	-0.068***
	20-100	0.168***	0.073***	0.038***	0.006	0.052***
	>100	0.840***	0.015**	0.023***	0.011	0.790***

Appendix—Not for Publication

Table A1: Job Creation and Investment Opportunities (County-level Results)

This table shows regressions of net employment creation at the county level on local income growth. Regressions are run for aggregate change in employment and for the change in employment in each of the 4 different age categories. Observations are at the county-year-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the county as of 2000. Income growth is the 2-year growth of total wages and salaries in the county. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a county. Panel A performs the analysis on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the county on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (11) perform similar regressions as column (2) and (3) for the net change in employment in firms of different ages. Panel B repeats the analysis in Panel A on an "overlapping" sample between 2000 and 2007. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis. Standard errors are clustered by county. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Panel A: Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	0.230***										
	(5.118)										
Income Growth		0.269***	0.028	0.060***	0.493***	0.004	-0.010	0.008*	-0.047	0.197***	-0.409
		(5.007)	(0.097)	(6.160)	(3.249)	(0.675)	(-0.157)	(1.664)	(-0.691)	(4.275)	(-1.294)
ln(Total Laborforce)	-0.090***	-0.068***	-0.093***	-0.029***	0.009	-0.001	-0.002	0.004**	-0.001	-0.042***	-0.099***
	(-11.044)	(-6.582)	(-3.194)	(-5.672)	(0.574)	(-0.309)	(-0.306)	(1.963)	(-0.137)	(-4.614)	(-3.171)
% Highschool Edu	-159.336***	-184.385***	-219.310***	-80.099***	-3.332	4.264	7.198	1.182	-9.201	-109.844***	-214.351***
	(-9.733)	(-8.525)	(-4.074)	(-7.526)	(-0.116)	(0.705)	(0.620)	(0.213)	(-0.729)	(-5.745)	(-3.699)
ln(Total CZ Wages)	0.076***	0.060***	0.082***	0.023***	-0.009	0.001	0.002	-0.003*	0.001	0.038***	0.087***
	(10.636)	(6.700)	(3.281)	(5.285)	(-0.684)	(0.589)	(0.455)	(-1.807)	(0.211)	(4.909)	(3.260)
Constant	1.017***	0.744***	1.061***	0.392***	-0.054	-0.006	0.005	-0.049**	0.007	0.405***	1.104***
	(11.805)	(6.781)	(3.194)	(7.131)	(-0.300)	(-0.221)	(0.064)	(-2.350)	(0.091)	(4.211)	(3.080)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,656	6,362	5,653	6,362	5,653	6,362	5,653	6,362	5,653	6,362	5,653
R-squared	0.153	0.094	0.072	0.043		0.002	0.002	0.003		0.069	
F-Statistics	26.26										

Panel B: Overlapping Sample (2000 to 2007)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	0.225***										
	(5.934)										
Income Growth		0.234***	-0.086	0.059***	0.515***	0.009**	-0.035	0.008*	-0.086*	0.158***	-0.480**
		(7.724)	(-0.384)	(7.382)	(4.160)	(1.980)	(-0.662)	(1.706)	(-1.703)	(6.034)	(-1.961)
ln(Total Laborforce)	-0.091***	-0.064***	-0.098***	-0.025***	0.015	-0.002	-0.006	0.002	-0.005	-0.040***	-0.102***
	(-12.014)	(-6.755)	(-4.135)	(-6.198)	(1.175)	(-0.859)	(-1.069)	(1.392)	(-1.018)	(-4.703)	(-3.990)
% Highschool Edu	-157.116***	-154.871***	-211.665***	-76.273***	-1.268	12.663***	9.004	1.668	-14.011	-93.053***	-205.750***
	(-9.566)	(-8.957)	(-5.045)	(-8.168)	(-0.053)	(3.030)	(0.944)	(0.441)	(-1.494)	(-5.871)	(-4.483)
ln(Total CZ Wages)	0.078***	0.057***	0.087***	0.019***	-0.014	0.002	0.005	-0.002	0.005	0.038***	0.091***
	(11.679)	(6.966)	(4.243)	(5.665)	(-1.310)	(1.191)	(1.190)	(-1.127)	(1.111)	(5.127)	(4.122)
Constant	1.032***	0.740***	1.116***	0.350***	-0.117	-0.002	0.043	-0.032*	0.056	0.424***	1.135***
	(12.766)	(7.385)	(4.159)	(8.218)	(-0.802)	(-0.125)	(0.721)	(-1.774)	(0.948)	(4.706)	(3.899)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,156	13,441	11,151	13,441	11,151	13,441	11,151	13,441	11,151	13,441	11,151
R-squared	0.147	0.091	0.054	0.047		0.004		0.004		0.058	
F-Statistics	35.27										

Table A2: Stacked Regression of Job Creation and Investment Opportunities

This table shows regressions of net employment creation at the commuting zone (CZ) level on local income growth. Observations are at the CZ-year-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the 2-year growth of total wages and salaries in the CZ. We include the dummies for different firm ages and the interaction terms of age dummies with income growth, in order to capture the difference in responsiveness across different age categories. We instrument for income growth using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a CZ. We perform the analysis on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the CZ on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis. Standard errors are clustered by CZ. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

	(1) First Stage	(2) OLS	(3) 2SLS
Manuf. Employment Bartik	1.038***		
	(6.781)		
Income Growth		0.146**	-0.048
		(2.009)	(-0.555)
Dummy(0-1yr) * Income Growth		-0.031	0.345***
		(-0.474)	(3.711)
Dummy(2-3yr) * Income Growth		-0.152**	0.055
		(-2.282)	(0.714)
Dummy(4-5yr) * Income Growth		-0.144**	0.129*
		(-2.226)	(1.668)
Dummy(0-1yr)		0.072***	0.062***
		(32.191)	(20.001)
Dummy(2-3yr)		0.017***	0.011***
		(8.290)	(4.477)
Dummy(4-5yr)		0.021***	0.013***
		(10.135)	(5.033)
Constant	1.231***	0.088*	0.056
	(5.687)	(1.783)	(0.858)
Year FE	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	6,800	7,372	6,800
R-squared	0.240	0.428	0.399
F-Statistics	53.49		

Table A3: Job Creation and Investment Opportunities—Using China Bartik as Instrument

This table performs the same analysis as Table 3 except using a different IV—the China Bartik—for income growth. This table shows regressions of net employment creation at the commuting zone (CZ) level on local income growth. Regressions are run for aggregate change in employment and for the change in employment in each of the 4 different age categories. Observations are at the CZ-year-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the 2-year growth of total wages and salaries in the CZ. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide import penetration from China in the manufacturing sector with the preexisting manufacturing composition in a CZ. Panel A performs the analysis on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the CZ on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (11) perform similar regressions as column (2) and (3) for the net change in employment in firms of different ages. Panel B repeats the analysis in Panel A on an "overlapping" sample between 2000 and 2007. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis. Standard errors are clustered by CZ. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Panel A: 02-07 (After China entered the WTO)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
China Bartik	0.628***										
	(4.722)										
Income Growth		0.245**	0.170	0.142***	0.302*	-0.011	-0.142**	-0.001	0.011	0.115	-0.001
		(2.533)	(0.688)	(7.729)	(1.660)	(-1.172)	(-2.473)	(-0.231)	(0.277)	(1.478)	(-0.004)
ln(Total Laborforce)	-0.116***	-0.048**	-0.055	0.003	0.025	-0.003	-0.020**	-0.000	0.001	-0.048***	-0.061**
	(-6.713)	(-2.557)	(-1.634)	(0.286)	(1.016)	(-1.020)	(-2.463)	(-0.032)	(0.143)	(-2.726)	(-1.970)
% Highschool Edu	-0.462**	-0.294	-0.279	0.678***	0.730***	-0.059	-0.092	-0.066**	-0.050	-0.846***	-0.869***
	(-2.167)	(-1.328)	(-1.183)	(4.021)	(4.222)	(-1.272)	(-1.553)	(-2.107)	(-1.558)	(-4.362)	(-4.180)
ln(Total CZ Wages)	0.102***	0.043***	0.049	-0.001	-0.020	0.003	0.017**	-0.000	-0.001	0.041***	0.053*
	(6.777)	(2.606)	(1.634)	(-0.063)	(-0.917)	(0.849)	(2.368)	(-0.150)	(-0.233)	(2.725)	(1.927)
Constant	1.280***	0.557***	0.614	-0.039	-0.287	0.035	0.217**	-0.000	-0.009	0.562***	0.695**
	(6.848)	(2.742)	(1.644)	(-0.346)	(-1.051)	(0.911)	(2.367)	(-0.003)	(-0.162)	(3.020)	(2.049)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,655	2,896	2,655	2,896	2,655	2,896	2,655	2,896	2,655	2,896	2,655
R-squared	0.229	0.092	0.084	0.121	0.063	0.018	-0.192	0.027	0.020	0.057	0.050
F-Statistics	22.29										

Table A4: Job Creation and Investment Opportunities—Using Per Capita Income Growth

This table performs the same analysis as Table 3 except using a different measure for investment opportunity—the per capita income growth. This table shows regressions of net employment creation at the commuting zone (CZ) level on local income growth. Regressions are run for aggregate change in employment and for the change in employment in each of the 4 different age categories. Observations are at the CZ-year-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the 2-year growth of per capita income in the CZ. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a CZ. Panel A performs the analysis on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the CZ on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (11) perform similar regressions as column (2) and (3) for the net change in employment in firms of different ages. Panel B repeats the analysis in Panel A on an "overlapping" sample between 2000 and 2007. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis. Standard errors are clustered by CZ. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Panel A: Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	0.593***										
	(6.462)										
Per Capita Income Growth		0.248***	0.592**	0.095***	0.389**	-0.002	-0.129**	-0.000	-0.013	0.155***	0.345
		(4.739)	(2.150)	(3.590)	(2.507)	(-0.213)	(-2.241)	(-0.035)	(-0.305)	(3.390)	(1.282)
ln(Total Laborforce)	-0.088***	-0.048***	-0.012	-0.004	0.026	-0.002	-0.015**	0.001	0.000	-0.044***	-0.024
	(-8.578)	(-3.118)	(-0.394)	(-0.363)	(1.391)	(-0.450)	(-2.153)	(0.615)	(0.021)	(-3.127)	(-0.806)
% Highschool Edu	0.401**	-0.531**	-0.696**	0.579***	0.398**	-0.062	0.008	-0.054	-0.030	-0.993***	-1.072***
	(2.228)	(-2.404)	(-2.317)	(3.422)	(2.238)	(-1.192)	(0.131)	(-1.601)	(-0.798)	(-5.205)	(-3.867)
ln(Total CZ Wages)	0.077***	0.044***	0.012	0.005	-0.022	0.001	0.013**	-0.002	-0.000	0.039***	0.021
	(8.453)	(3.230)	(0.438)	(0.532)	(-1.301)	(0.365)	(2.069)	(-0.747)	(-0.090)	(3.148)	(0.807)
Constant	0.911***	0.533***	0.261	0.041	-0.224	0.012	0.136**	-0.018	-0.005	0.497***	0.353
	(7.919)	(3.228)	(0.896)	(0.345)	(-1.208)	(0.292)	(1.982)	(-0.674)	(-0.114)	(3.334)	(1.293)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,700	1,843	1,700	1,843	1,700	1,843	1,700	1,843	1,700	1,843	1,700
R-squared	0.707	0.084	0.058	0.072	-0.050	0.013	-0.088	0.011	0.007	0.068	0.060
F-Statistics	41.75										

Table A5: Random Effects Estimates

This table performs the same analysis as Table 3 but includes CZ random effect in the analysis. This table shows regressions of net employment creation at the commuting zone (CZ) level on local income growth. Regressions are run for aggregate change in employment and for the change in employment in each of the 4 different age categories. Observations are at the CZ-year-firm age level. The dependent variable is the net change in employment in the non-tradable sector (NAICS2= 44, 45 and 72) over the previous two years created in firms of each age category, and this variable is scaled by the total non-tradable employment in the CZ as of 2000. Income growth is the 2-year growth of total wages and salaries in the CZ. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in a CZ. The table performs the analysis on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the CZ on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (11) perform similar regressions as column (2) and (3) for the net change in employment in firms of different ages. All regressions include year fixed effects. T-statistics are shown in parenthesis. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Non-overlapping Sample (01, 03, 05, 07)		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	0.765***										
	(6.581)										
Income Growth		0.262***	0.311**	0.038**	0.376***	0.003	-0.079***	-0.002	-0.022	0.157**	0.041
		(2.612)	(2.104)	(2.557)	(5.862)	(0.466)	(-2.831)	(-0.439)	(-1.035)	(1.972)	(0.299)
Constant	0.064***	0.005	0.003	0.048***	0.029***	-0.010***	-0.006***	-0.005***	-0.004***	-0.024***	-0.017**
	(26.613)	(0.757)	(0.280)	(30.578)	(7.382)	(-14.885)	(-3.344)	(-9.474)	(-3.062)	(-4.667)	(-2.043)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	No	No	No	No	No	No	No	No	No	No
Observations	1,700	1,843	1,700	1,843	1,700	1,843	1,700	1,843	1,700	1,843	1,700
Number of CZs	506	507	506	507	506	507	506	507	506	507	506
Wald Chi Square	111.22										

Table A6: Job Creation and Investment Opportunities–All Industries–Comparison of QWI and BDS Data

This table shows regressions of net employment creation at the commuting zone (CZ) and Metropolitan Statistical Area (MSA) level on local income growth. The dependent variable is the net change in employment in all sectors over the previous two years in firms of each age category. This variable is scaled by the total non-tradable employment in the region (CZ in Panel A, MSA in Panels B and C) as of 2000. Income growth is the 2-year growth of total wages and salaries in the region (CZ in Panel A, MSA in Panels B and C). We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in an area. All panels use a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. Column (1) reports the first stage regression of income growth on the manufacturing employment instrument. Column (2) is the OLS regression of net employment change on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (11) perform similar regressions as columns (2) and (3) for firms of different ages. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis and standard errors are clustered by CZ in Panel A and by MSA in Panel B, C. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Panel A: CZ-level, QWI Data, Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.043***										
	(7.223)										
Income Growth		0.362***	0.541***	0.174***	0.414***	0.008	-0.078**	0.001	-0.017	0.180***	0.221**
		(3.628)	(4.445)	(6.263)	(6.816)	(1.088)	(-2.547)	(0.101)	(-0.762)	(2.718)	(1.974)
ln(Total Laborforce)	-0.112***	-0.026	0.001	-0.002	0.033***	0.000	-0.010*	0.001	-0.001	-0.025*	-0.021
	(-5.713)	(-1.390)	(0.039)	(-0.189)	(2.933)	(0.033)	(-1.907)	(0.553)	(-0.329)	(-1.677)	(-1.149)
% Highschool Edu	-0.573**	-0.020	0.078	0.475***	0.522***	-0.030	-0.060	-0.029	-0.023	-0.436***	-0.362**
	(-2.360)	(-0.106)	(0.422)	(2.857)	(3.689)	(-0.605)	(-1.085)	(-0.773)	(-0.582)	(-3.090)	(-2.460)
ln(Total CZ Wages)	0.100***	0.022	-0.002	-0.000	-0.031***	0.001	0.010**	-0.001	0.001	0.022*	0.018
	(5.968)	(1.341)	(-0.109)	(-0.008)	(-3.074)	(0.179)	(2.025)	(-0.544)	(0.332)	(1.711)	(1.143)
Constant	1.265***	0.288	-0.024	0.023	-0.365***	-0.004	0.108*	-0.016	0.012	0.285*	0.222
	(6.015)	(1.457)	(-0.112)	(0.225)	(-2.967)	(-0.112)	(1.845)	(-0.626)	(0.313)	(1.784)	(1.131)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,748	1,901	1,748	1,901	1,748	1,901	1,748	1,901	1,748	1,901	1,748
R-squared	0.246	0.173	0.138	0.149	-0.070	0.009	-0.113	0.017	0.008	0.095	0.093
F-Statistics	52.17										

Panel B: MSA-level, QWI Data, Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.684***										
	(9.709)										
Income Growth		0.679***	0.836***	0.196***	0.392***	0.023**	-0.016	0.007	0.002	0.454***	0.458***
		(12.828)	(8.423)	(6.737)	(6.380)	(2.568)	(-0.899)	(0.742)	(0.115)	(10.698)	(6.866)
ln(Total Laborforce)	-0.064***	0.015	0.027**	0.000	0.014*	-0.004	-0.005*	-0.002	-0.002	0.021**	0.020*
	(-3.566)	(1.545)	(2.159)	(0.013)	(1.781)	(-1.366)	(-1.729)	(-0.772)	(-0.652)	(2.186)	(1.916)
% Highschool Edu	-0.986***	-0.298	-0.297	-0.054	0.079	0.031	0.007	-0.043	-0.025	-0.232	-0.358**
	(-3.285)	(-1.368)	(-1.372)	(-0.258)	(0.460)	(0.597)	(0.115)	(-0.938)	(-0.524)	(-1.328)	(-2.159)
ln(Total CZ Wages)	0.056***	-0.017*	-0.027**	-0.003	-0.016**	0.004	0.005*	0.002	0.002	-0.019**	-0.018*
	(3.427)	(-1.893)	(-2.385)	(-0.441)	(-2.196)	(1.512)	(1.843)	(0.822)	(0.684)	(-2.252)	(-1.951)
Constant	0.790***	-0.158	-0.282**	0.050	-0.127	0.028	0.049	0.019	0.018	-0.255**	-0.222*
	(3.958)	(-1.437)	(-2.023)	(0.549)	(-1.395)	(0.959)	(1.426)	(0.680)	(0.553)	(-2.451)	(-1.932)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,088	1,166	1,086	1,166	1,086	1,166	1,086	1,166	1,086	1,166	1,086
R-squared	0.307	0.353	0.336	0.083	0.006	0.023	-0.006	0.026	0.035	0.192	0.184
F-Statistics	94.27										

Panel C: MSA-level, BDS Data, Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.830***										
	(11.183)										
Income Growth		0.645***	1.164***	0.222***	0.404***	0.003	0.001	0.004	-0.015	0.415***	0.774***
		(6.164)	(7.066)	(6.512)	(11.646)	(0.694)	(0.037)	(1.087)	(-1.337)	(5.420)	(4.725)
ln(Total Laborforce)	-0.060***	-0.042***	-0.010	0.004	0.019***	-0.004*	-0.005**	0.000	-0.002	-0.042***	-0.022
	(-3.973)	(-2.853)	(-0.553)	(0.527)	(2.824)	(-1.876)	(-2.230)	(0.073)	(-1.060)	(-3.216)	(-1.330)
% Highschool Edu	-1.179***	-0.324	0.457	0.013	0.177	-0.018	-0.016	-0.020	-0.026	-0.299	0.323
	(-4.811)	(-0.929)	(1.542)	(0.086)	(1.395)	(-0.435)	(-0.355)	(-0.646)	(-0.817)	(-1.139)	(1.085)
ln(Total CZ Wages)	0.052***	0.039***	0.009	-0.003	-0.017***	0.004**	0.004**	0.000	0.002	0.038***	0.020
	(3.801)	(2.938)	(0.545)	(-0.495)	(-2.812)	(1.973)	(2.250)	(0.023)	(1.203)	(3.265)	(1.312)
Constant	0.771***	0.497***	0.031	0.002	-0.185**	0.040*	0.044*	-0.005	0.018	0.461***	0.154
	(4.572)	(2.948)	(0.151)	(0.022)	(-2.456)	(1.654)	(1.803)	(-0.257)	(0.918)	(3.151)	(0.798)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,421	1,384	1,292	1,384	1,292	1,384	1,292	1,384	1,292	1,384	1,292
R-squared	0.299	0.162	0.103	0.271	0.076	0.042	0.039	0.034	0.020	0.110	0.082
F-Statistics	117.04										

Table A7: Job Creation and Investment Opportunities - Firm Age by Firm Size - Detail

This table shows regressions of net employment creation at the Metropolitan Statistical Area (MSA) level on local income growth (this is a detailed version of Table 9). Regressions are run for the aggregate change in employment in each of the 4 different age categories and 3 size categories. Panel A focuses on the firms with less than 20 employees, Panel B analyzes the firms with 20-100 employees while Panel C focuses on larger firms with more than 100 employees. The dependent variable is the net change in employment in all sectors over the previous two years created in firms of each age-size category, and this variable is scaled by the total non-tradable employment in the MSA as of 2000. Income growth is the 2-year growth of total wages and salaries in the MSA. We instrument for this variable using the Bartik manufacturing shock, which interacts changes in nationwide employment in the manufacturing sector with the preexisting manufacturing composition in the MSA. The analysis is performed on a "non-overlapping" sample of years 2001, 2003, 2005 and 2007. In each panel, Column (1) reports the first stage regression of income growth on the Bartik instrument. Column (2) is the OLS regression of net employment change in the MSA on local income growth, and column (3) is the 2SLS regression with instrumented income growth. Columns (4) to (11) perform similar regressions as columns (2) and (3) for firms of different ages. Control variables are extracted from the 2000 Census and the Bureau of Labor Statistics. All regressions include year fixed effects. T-statistics are shown in parenthesis and standard errors are clustered by MSA. *, **, *** denote statistical significance at the 10, 5 and 1% levels, respectively.

Panel A: Employee<20, Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.830***										
	(11.183)										
Income Growth		0.120***	0.156***	0.173***	0.316***	-0.031***	-0.061***	-0.010***	-0.032***	-0.011***	-0.068***
		(6.145)	(10.361)	(6.506)	(11.190)	(-5.686)	(-6.243)	(-4.008)	(-4.728)	(-2.825)	(-5.318)
ln(Total Laborforce)	-0.060***	-0.000	0.002	-0.002	0.009*	-0.000	-0.003**	0.000	-0.002*	0.002	-0.002
	(-3.973)	(-0.140)	(1.170)	(-0.471)	(1.869)	(-0.147)	(-2.081)	(0.388)	(-1.692)	(1.021)	(-1.042)
% Highschool Edu	-1.179***	0.099*	0.144***	0.106	0.237**	0.012	-0.004	0.016	-0.008	-0.035	-0.080*
	(-4.811)	(1.862)	(3.142)	(0.847)	(2.292)	(0.327)	(-0.124)	(0.890)	(-0.497)	(-0.803)	(-1.879)
ln(Total CZ Wages)	0.052***	-0.001	-0.003*	-0.001	-0.013***	0.001	0.004**	-0.000	0.002**	-0.000	0.004**
	(3.801)	(-0.458)	(-1.725)	(-0.306)	(-2.681)	(0.473)	(2.435)	(-0.108)	(2.079)	(-0.018)	(2.035)
Constant	0.771***	-0.004	-0.043*	0.053	-0.094	-0.009	0.027	-0.010	0.014	-0.037	0.011
	(4.572)	(-0.209)	(-1.800)	(0.909)	(-1.639)	(-0.458)	(1.447)	(-0.949)	(1.366)	(-1.648)	(0.472)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,421	1,384	1,292	1,384	1,292	1,384	1,292	1,384	1,292	1,384	1,292
R-squared	0.299	0.268	0.250	0.312	0.115	0.108	0.034	0.066	-0.065	0.120	-0.035
F-Statistics	117.04										

Panel B: Employee between 20 and 100, Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.830***										
	(11.183)										
Income Growth		0.117***	0.168***	0.040***	0.073***	0.025***	0.038***	0.008***	0.006	0.043***	0.052***
		(5.829)	(7.650)	(5.817)	(6.436)	(4.921)	(3.516)	(2.623)	(0.558)	(4.207)	(3.061)
ln(Total Laborforce)	-0.060***	-0.011***	-0.007**	0.005**	0.008***	-0.005***	-0.004**	0.000	0.000	-0.011***	-0.011***
	(-3.973)	(-3.453)	(-2.167)	(2.314)	(3.810)	(-3.342)	(-2.382)	(0.280)	(0.348)	(-4.399)	(-4.296)
% Highschool Edu	-1.179***	-0.154**	-0.140**	-0.047	-0.025	-0.048	-0.042	0.020	0.031	-0.079	-0.105*
	(-4.811)	(-2.501)	(-2.208)	(-1.231)	(-0.674)	(-1.497)	(-1.288)	(0.602)	(1.083)	(-1.532)	(-1.874)
ln(Total CZ Wages)	0.052***	0.009***	0.005*	-0.002	-0.005***	0.003**	0.002	-0.001	-0.001	0.008***	0.008***
	(3.801)	(3.005)	(1.666)	(-1.202)	(-2.644)	(2.446)	(1.415)	(-0.525)	(-0.532)	(3.483)	(3.403)
Constant	0.771***	0.134***	0.079**	-0.042*	-0.075***	0.065***	0.045**	-0.005	-0.008	0.116***	0.116***
	(4.572)	(3.769)	(2.206)	(-1.779)	(-3.276)	(3.739)	(2.556)	(-0.346)	(-0.507)	(4.180)	(3.895)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,421	1,384	1,292	1,384	1,292	1,384	1,292	1,384	1,292	1,384	1,292
R-squared	0.299	0.145	0.111	0.209	0.164	0.112	0.105	0.033	0.029	0.072	0.073
F-Statistics	117.04										

Panel C: Employee>100, Non-overlapping Sample (01, 03, 05, 07)

		Aggregate		0-1 year-olds		2-3 year-olds		4-5 year-olds		6+ year-olds	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	1st Stage	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV
Manuf. Employment Bartik	1.830***										
	(11.183)										
Income Growth		0.408***	0.840***	0.008**	0.015**	0.009***	0.023***	0.007**	0.011	0.384***	0.790***
		(5.447)	(5.338)	(2.404)	(2.500)	(3.037)	(2.925)	(2.359)	(1.608)	(5.372)	(5.018)
ln(Total Laborforce)	-0.060***	-0.031**	-0.006	0.001	0.002*	0.002	0.002**	-0.001	-0.001	-0.033***	-0.009
	(-3.973)	(-2.464)	(-0.354)	(1.364)	(1.874)	(1.513)	(1.962)	(-0.648)	(-0.755)	(-2.663)	(-0.553)
% Highschool Edu	-1.179***	-0.269	0.453	-0.045*	-0.035	0.017	0.030	-0.056***	-0.050**	-0.185	0.508*
	(-4.811)	(-0.921)	(1.516)	(-1.898)	(-1.430)	(0.616)	(1.104)	(-2.645)	(-2.287)	(-0.644)	(1.747)
ln(Total CZ Wages)	0.052***	0.031***	0.008	0.001	0.000	-0.001	-0.001	0.001	0.001	0.030***	0.008
	(3.801)	(2.758)	(0.511)	(0.871)	(0.176)	(-0.545)	(-1.119)	(0.829)	(0.888)	(2.720)	(0.533)
Constant	0.771***	0.367**	-0.005	-0.009	-0.016	-0.016	-0.027**	0.011	0.012	0.382***	0.026
	(4.572)	(2.563)	(-0.029)	(-0.972)	(-1.590)	(-1.411)	(-2.164)	(1.047)	(1.060)	(2.695)	(0.140)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,421	1,384	1,292	1,384	1,292	1,384	1,292	1,384	1,292	1,384	1,292
R-squared	0.299	0.113	0.070	0.203	0.195	0.081	0.065	0.029	0.027	0.105	0.066
F-Statistics	117.04										