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Does Local Business Ownership Stabilize Employment?

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I. Introduction

Local economic policies sometimes favor the creation and growth of locally-owned businesses. Our goal in this paper is to assess one of the prominent arguments in favor of such policies. In particular, the argument is that locally-owned firms are more likely to internalize the costs to the community of decisions to reduce employment – including closing or relocating. This may stem from economic factors, such as the costs that decision-makers bear affecting their own economic well-being via effects on their communities. It may also stem from loyalty toward the headquarters’ hometown or a desire for better public relations in the headquarters’ hometown, perhaps for political reasons.

An empirical implication of this argument is that, when faced with an unfavorable “shock” that reduces the demand for labor, firms are less likely to reduce employment in the areas in which they are headquartered.¹ The same would hold true for single-establishment firms relative to multiple-establishment firms with headquarters elsewhere. To assess this hypothesis, we examine how the establishment-level employment response to labor demand shocks is affected by establishment ownership. We compare the employment responses of single-establishment firms, headquarters of multi-establishment firms, establishments in locally-headquartered multi-establishment firms, and establishments in non-locally-headquartered multi-establishment firms to both industry shocks (nationally – that is, across all regions) and regional shocks (across all industries). We use data from the National Establishment Time Series, covering the entire United States for the period 1992-2006.

¹ Of course employment decisions are not driven only by demand shocks. Changes in input prices, policy, and other factors affecting the costs or benefits associated with particular locations can affect these decisions as well. Our analysis captures any sources of shocks that are reflected in industry employment or regional employment; the former seem more likely to reflect things such as changes in input prices, and the latter changes in local or state policies, although the distinction is not hard and fast.

II. Policies Favoring Locally-Owned Businesses

As one example of a policy favoring locally-owned businesses, San Francisco passed an ordinance in 2004, subsequently amended by referendum in 2006, to regulate the spread of “formula businesses,” which are essentially retail chains including food and drink establishments.² The ordinance barred such establishments from certain locations in the city, and requires notification of neighborhood residents if such businesses planned to open. Residents could then request review by the city’s Planning Commission, which was in turn required to consider factors including aesthetics, existing concentrations of formula businesses, availability of similar retail uses in the district, etc. The ordinance explicitly stated that “San Francisco needs to protect its vibrant small business sector and create a supportive environment for new small business innovations,” and noted that one of the priorities of the City’s General Plan is that “existing neighborhood-serving retail uses be preserved and enhanced and future opportunities for resident employment in and ownership of such businesses enhanced.”³ Proposition G, passed in 2006, requires Planning Commission review for *all* formula retail applications.

Similar laws have been passed in other cities. Aside from San Francisco, formula retail laws have only been adopted in small towns that might be viewed as tourist destinations. Some of these (e.g., in Sanibel, Florida) bar formula restaurants only, whereas others (e.g., Bristol, Rhode Island) restrict other formula businesses as well.⁴ In addition to these blanket restrictions on chains, many cities or other local jurisdictions have adopted “store size cap” ordinances that establish maximum square footage, which effectively bars big-box retailers from opening stores

² See <http://www.newrules.org/retail/sanfran.html> (viewed December 22, 2008).

³ San Francisco City Planning Code Section 703.3. See <http://www.municode.com/resources/gateway.asp?pid=14139&sid=5> (viewed December 22, 2008).

⁴ See <http://www.newrules.org/retail/formula.html> (viewed December 22, 2008).

in at least their standard format.⁵ These are more pervasive than formula business restrictions, and some are in mid-size cities (such as Madison, Wisconsin) or suburbs of major metropolitan areas (such as Rockville, Maryland). More generally, there is a good deal of political activism to promote local ownership of businesses, and many cities have policies aimed at supporting such businesses, including local purchasing programs, set-asides for local retail, etc.⁶

What are the arguments for promoting local ownership of businesses? Among the economic arguments that are cited are: preserving opportunities for people to start small businesses; favoring smaller local businesses that preserve downtown areas and neighborhood business districts; strengthening local economies from local businesses spending more of their revenue locally; encouraging innovation, variety, and competition; and ensuring the longer-term economic stability of local economies. These arguments are cited by policy advocates such as the New Rules Project.

In general, evidence the validity of these arguments is limited. Some of these arguments have received attention in the research literature, although not always in relation to policies to promote local businesses. For example, there is research that explores the role of entrepreneurship in upward income mobility, and has found that self-employment is associated with upward mobility for low-income individuals (Holtz-Eakin et al., 2000). Research on the impact of Wal-Mart and other big-box retailers has focused on the impact of large store openings on local economies (e.g., Stone, 1995). The findings of these studies are not unambiguous. For example, Stone concludes that that Wal-Mart pulls more customers to the host town, hurts its

⁵ See <http://www.newrules.org/retail/size.html> for a list of these ordinances.

⁶ For several examples nationally, see: <http://www.businessweek.com/print/smallbiz/content/feb2009/sb200902> (viewed April 2, 2009); for Jacksonville, Florida, see <http://www.northfloridanewsdaily.com/News/2008/1201/community/180.html> (viewed December 22, 2008); for Pleasanton, California, see <http://www.ci.pleasanton.ca.us/pdf/cc-work-plan-05.pdf> (viewed December 22, 2008).

local competitors, but benefits some other local businesses that do not directly compete with it.⁷ We are not aware of academic research on the issues of local spending and innovation, although there are some consulting studies supporting the arguments made by advocates for policies favoring local ownership (Civic Economics, 2004 and 2007); however, these studies were commissioned by groups supporting local ownership policies.⁸ We have some reservations about claims about the higher share of local business spending remaining in the community, because it seems virtually impossible to track the spending of stockholders in retail chains and other large firms. On the surface, the argument about diversity seems compelling, although some argument about market failure is needed to explain why chains would win out over local businesses in the competition for consumer spending.

In this paper, however, we focus on the last argument cited above about the advantages of local ownership – namely the argument that locally-owned firms provide a more stable economic environment. This argument takes a number of forms. The New Rules Project argues that “Communities with economies composed of many small businesses focused primarily on serving local needs are more diversified and stable than those dependent on a few large firms, and less vulnerable to distant economic forces.”⁹ Academics have made a similar argument, but one that has more of the flavor of local owners internalizing some of the costs of decisions about businesses, in particular closing or shrinking a businesses.¹⁰ Morgan (1953) suggested that “With local plants of decentralized big business, policy usually is made at a distance and the local community tends to become the ward of its destiny makers ... In the evolution of big company

⁷ However, overall the entry of Wal-Mart stores reduces employment (Neumark et al., 2007). For a recent study of the effects of Wal-Mart on small businesses, and a critique of that study, see Sobel and Dean (2008) and <http://www.newrules.org/retail/wm-smallbusiness.pdf> (viewed December 22, 2008).

⁸ See <http://www.andersonvilledevcorp.org/> (viewed December 22, 2008), and <http://sfloma.org/> (viewed December 22, 2008).

⁹ See <http://www.newrules.org/retail/platform.html> (viewed December 22, 2008).

¹⁰ This question has also been asked with respect to environmental issues – specifically, whether plants owned by companies headquartered out of state emit more pollutants (Grant et al., 2004).

policy a local plant may be abandoned or moved, leaving the community without an economic base. Where a plant is owned in the community the chance is greater that local interests will have consideration” (p. 161). Williamson (1993) proffers a more specific but related hypothesis – that outside owners of a business contemplating a plant closing will undervalue the firm-specific capital of the existing workforce (p. 105). Tolbert (2005) has a clear statement of this hypothesis: “Locally oriented businesses have stakes in the local labor market, the local economy, the local infrastructure, and – usually – the local product market. As the community goes, so go these entities. Persons owning, managing, and working in these establishments rarely employ a multinational or corporate perspective. The worldview is local. To lay off workers in slack times, for example, would mean taking jobs from relatives, friends, and neighbors” (p. 1311).¹¹

Along a somewhat different vein, Anderson and Barkley (1982) do not focus on externality-related issues, but instead on the underlying economics. In particular, they note that branch establishments of multi-establishment firms may be more prone to closing than are locally-owned single-establishment firms simply because the former have the capacity to reduce costs by moving production across different establishments. On the other hand, they point out that larger, multi-establishment firms, both because of this flexibility, and their ability to attract better managers and finance, may be less prone to cyclical or secular downturns in economic activity, which could make their establishments – even if not locally owned, more stable.¹²

III. Existing Research

There is limited direct evidence on how local ownership impacts the stability of employment in general, or the response to economic shocks in particular. And we are not aware

¹¹ There is also a legal literature that considers the potential failure of corporations to internalize the negative costs of plant-closing decisions on the affected communities in considering the legality (and wisdom) of laws that impose some restrictions on such decisions (Macey, 1989).

¹² They also hint at externality-type arguments, suggesting that “indigenous firms are more susceptible to locational inertia than plants whose owners reside outside the community” (p. 3).

of any research that studies directly the effects of public policies favoring local businesses. There is some research that focuses mainly on plant closings (exit) in the manufacturing sector, most of which is quite dated. We summarize this research briefly.¹³

Anderson and Barkley (1982) study data on manufacturing plants employing 20 or more workers in non-urban areas of Iowa between 1965 and 1975. They used directories of Iowa manufacturers to track plant closings, and also surveyed community leaders, bankers, company executives, and employees. They estimate probit models for plant closings, and find that branch plants were significantly more likely to close than were non-branch plants.¹⁴ However, this relationship is only statistically significant for plants with 100 or fewer employees.¹⁵ In addition, there is no attempt to tie plant closing behavior to industry-specific shocks. Clearly within manufacturing there are many sub-industries, and differential shocks to these industries that are correlated with differences in local ownership across industries could also drive the results.

Looking at a subset of manufacturing industries using national Dun and Bradstreet data, Howland (1988) also reports that branch and subsidiary plants are more likely to close. She does attempt to include measures of market demand, but does not explore whether market demand has differential effects on branch and subsidiary plants versus independent plants or headquarters.

Similar results on branches versus locally-owned manufacturing establishments have been reported in more recent work, although this research, also, does not focus on responses to shocks. Based on data from U.S. Small Business Administration's Small Business Database on

¹³ There is a small related literature on foreign- versus domestic-owned plants in developing countries (e.g., Bernard and Sjöholm, 2003).

¹⁴ They equate closing and relocating out of an area. In an earlier study, Barkley (1978) distinguishes between the two, finding that although locally-owned plants are more likely to fail, they are still more stable locationally (i.e., less likely to exit by way of closure *or* relocation) because they are less likely to relocate out of an area. From the point of view of a local community, however, the distinction does not seem relevant.

¹⁵ The authors refer to non-branch plants as "locally owned," but as best we can tell, what they really mean is that the plant is a single-establishment firm, which does not necessarily coincide with local ownership. This is slightly different from our analysis, where we focus on whether an establishment reports to a headquarters in the same region (which could be the same site).

manufacturing start-ups in the 1976-1986 period, Audretsch (1994) finds that branch establishments are more likely to exit. In contrast, Dunne et al. (1989), using data from the Census of Manufactures for 1967, 1972, and 1977, find the opposite. However, Audretsch suggests, based on his results, that this is because Dunne et al. did not control for the initial size of plants, and that the higher exit rate they find for single-unit establishments is accounted for by the smaller initial size of these establishments. Similar conclusions are reached in more recent research by Bernard and Jensen (2007), based on data from the Longitudinal Research Database covering years from 1987 to 1997. They find that, unconditionally, single-unit manufacturing plants are more likely to close than are plants in multi-unit firms (or multinationals). However, once they condition on plant and industry characteristics (size, capital intensity, TFP, etc.), the relationship is reversed, with single-unit establishments less likely to close.

From the perspective of policies to encourage local ownership, the finding that locally-owned businesses may be more stable conditional on establishment characteristics may be of less interest than results that do not condition on these characteristics. For example, locally-owned businesses may be more likely to start-up at smaller sizes and with different characteristics, and while policymakers may have some influence over the unconditional composition of new establishments between locally-owned or not, they seem unlikely to have much control at all over the conditional composition. For example, policies favoring local businesses may result in one fewer Home Depot and many more small, locally-owned hardware, building supply, and appliance stores. But they are unlikely to result in a locally-owned one-stop store selling all these items on the scale of a Home Depot. In that sense, the unconditional survival rate of locally-owned and other businesses may be more relevant to asking whether policies promoting local ownership also promote employment stability.

In general, the existing research clearly does not say very much about the question at hand. It does not speak directly to the question of how locally-owned versus other establishments respond differentially to economic shocks. In addition, it does not extend beyond the manufacturing sector. Perhaps most interesting, it seems to suggest that single-establishment, most likely locally-owned manufacturing plants are less likely to close, perhaps bolstering the notion that such enterprises offer more stable employment. However, as noted, without taking account of industry-specific shocks, this evidence is hard to interpret. Moreover, the lower exit rate of locally-owned plants seems to arise mainly with controls for other plant characteristics.

IV. Descriptive Evidence on Local Ownership

We begin our analysis in this section by presenting evidence on patterns of local ownership of businesses nationally and changes in these patterns over the time period covered by our data. We use the National Establishment Time Series (NETS) database, a national, longitudinal file of the universe of business establishments created by Walls & Associates using establishment-level data from Dun & Bradstreet, a leading provider of business credit information and credit reports. Our extract of the NETS covers the entire U.S. over the period 1992-2006.¹⁶

To describe patterns of local ownership, we categorize establishments in the NETS based on the number of establishments in the firm and, for multi-establishment firms, the location of the firm's headquarters relative to the establishment. Each establishment is either:

- 1) A single-establishment firm;
- 2) The headquarter establishment of a multi-establishment firm, hereafter "headquarters";

¹⁶ For more information on the NETS, including detailed assessment of the data quality, see Neumark et al. (2007) and Kolko and Neumark (2007).

- 3) A non-headquarter establishment of a multi-establishment firm in the same region as the firm's headquarters, hereafter "locally-owned establishment"; or
- 4) A non-headquarter establishment of a multi-establishment firm in a different region than the firm's headquarters, hereafter "non-locally-owned establishment."

In the NETS, each establishment is identified with a Data Universal Numbering System (DUNS) number and includes a field indicating the DUNS number of the headquarters establishment ("HQ DUNS") to which the establishment belongs. Single-establishment firms are defined as establishments for which the DUNS number equals HQ DUNS and no other establishment exists with the same HQ DUNS. Establishments in multi-establishment firms have HQ DUNS shared by other establishments in the firm; for the headquarters, the DUNS number equals the HQ DUNS. A small share of establishments was not categorizable, either because the HQ DUNS was missing, the HQ DUNS did not exist as a DUNS number for another establishment in the database (which is how we can identify headquarter location), or the DUNS number was unique in the NETS (suggesting a single-establishment firm) but did not equal the HQ DUNS (suggesting a multi-establishment firm). Of the roughly 200 million establishment-year observations, 0.7% were uncategorizable for these reasons, accounting for 1.9% of employment.¹⁷

"Local ownership" means that the establishment is the firm's headquarters or is located in the same region as its firm's headquarters. Regions consist of metropolitan areas plus one

¹⁷ One reason why the HQ DUNS might not exist as a DUNS number elsewhere in the database is foreign ownership. Because the NETS covers only U.S. establishments and includes those belonging to firms headquartered outside the United States, a foreign-owned firm's establishments would show a value for HQ DUNS that does not correspond to a (U.S.) establishment in the database. It is unclear how much foreign ownership accounts for the establishments we could not categorize.

additional region per state consisting of all non-metropolitan counties in the state.¹⁸ Single-establishment firms are, by definition, locally owned. An establishment in a multi-establishment firm is locally owned if it is the headquarter establishment or is located in the same region as headquarters. The only non-locally-owned establishments are those in multi-establishment firms whose headquarter establishment is in a different region. Locally-owned establishments therefore include three distinct types of establishments, which we will refer to with the labels described above: single-establishment firms, headquarters, and locally-owned establishments.

The share of national employment in non-locally-owned establishments was roughly the same in 1992 (24.2%) and in 2006 (23.9%), as shown in Table 1. This share fell slightly from the 1992 level to 23.8% in 1994, rose to 26.0% in 2000, settled around 25% over the period 2001-2005, and then fell to 23.9% in 2006.¹⁹ Aggregating over the entire period, 24.7% of employment was in non-locally-owned establishments (see Table 2). Nearly half of employment – 48.8% – was in single-establishment firms, 10.6% was in headquarters, and 14.0% was in locally-owned establishments. Together, these latter three categories – the three types of locally owned establishments – account for 73.4% of employment.²⁰ Because single-establishment firms have fewer employees, on average, than establishments of multi-establishment firms, single establishment firms account for a much larger share – 86.4% – of establishments. The average

¹⁸ We use the 2006 Core Based Statistical Areas, of which there are 938 metropolitan and micropolitan statistical areas. We add 45 non-metropolitan regions, one for each state except Connecticut, Delaware, Hawaii, New Jersey, Rhode Island, and D.C., which contain no non-metropolitan counties, for a total of 983 regions.

¹⁹ In earlier research (Kolko and Neumark, 2008), we found some evidence of an increasing tendency of firms to be dispersed geographically, with the implication that local jurisdictions are increasingly likely to have workers employed by companies headquartered elsewhere. Focusing on the share of employment in California reporting to companies with headquarters outside the state, we found that over the sample period 1992-2004 this share rose by about 2.2 percentage points. This change in dispersion was positively correlated, at the industry level, with a measure of information technology usage, suggesting that declining communications costs contribute to dispersion.

²⁰ Local ownership varies widely across industries. For instance, only 6% of employment in general merchandise stores is in single-establishment firms, compared with over 80% of employment in the building construction and specialty trade contractor industries. Over half of employment in the paper manufacturing industry and the telecommunications industry is in non-locally-owned establishments, versus less than 25% of employment in the motor vehicle and parts dealers industry and the professional, scientific, and technical services industry.

single-establishment firm has 6 employees, compared with 51 in the average headquarters, 40 in the average locally-owned establishment, and 37 in the average non-locally-owned establishment.

V. Empirical Framework

Define Y_{ijst} as the percentage change in employment of establishment i in industry j , region s , and year t , measured as the one-year change in employment divided by the average of start-year and end-year employment. The change in employment can include reductions to no employment due to closing or relocation to another area, and increases due to expansions. However, births are of necessity omitted because we have no way of classifying the ownership of an establishment before it is created. Because births are an important source of job creation, the average employment change for establishments excluding births is negative, as shown in the last column of Table 2, even though national employment growth over the period was positive. From the perspective of a region, an establishment that relocates out of that region is a reduction of its local employment to zero. Accordingly, we treat inter-regional relocations like closings for the region losing the establishment.²¹ As described above, “regions” are metropolitan areas plus aggregations of non-metropolitan counties by state. “Industries” follow the 3-digit NAICS classification; we exclude public-sector and farm-based industries and have 83 industries in our analysis.

Variation in Y is explained in part by industry-level and region-level shocks, so we estimate models of the form:

$$(1) \quad Y_{ijst} = f(\{\sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t}\}, \{\sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t}\}, X_{it}, \eta_t) .$$

²¹ The flip side is that, from the perspective of the region *gaining* the relocating establishment, the relocation has the same effect on local employment as an establishment birth. Just as we exclude births from our analysis, we do not count job growth for the region gaining a relocating establishment. We stress that relocation is rare: 0.23% of establishment-year observations are relocations, or 0.27% when weighted by establishment employment.

Initially we estimate this model pooling across industries, regions, and years, though we will also estimate this model for subsets of industries. In this equation, the first sum – the industry-specific shock – is the sum of Y over all establishments in industry j and year t in regions other than the one in which the observation is located (to avoid the reflection problem). The second sum – the region-specific shock – is the sum of Y over all establishments in all industries in region s and year t in industries other than the establishment’s industry (again to avoid the reflection problem). The relative importance of industry-specific and region-specific shocks could vary by industry, in that establishments in industries that produce for a local market, like personal services or construction, might be affected more by region-specific shocks than establishments in industries that produce for a national or global market, like automobiles; we consider this issue later. Year fixed-effects (η_t) capture aggregate shocks, since the model is pooled across years. We condition on establishment size and firm size, using size category dummies.²² We also condition on the specialization of industry j in region s , using a location quotient, measuring the ratio of industry j ’s share in region s ’s employment relative to industry j ’s share in national employment. These are included in X_{it} .

Linearizing this equation, we get a regression model

$$(2) \quad Y_{ijst} = \alpha + \beta \{ \sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t} \} + \gamma \{ \sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t} \} + X_{it} \delta + \eta_t + \varepsilon_{ijst} .$$

We expect to find $\beta > 0$ and $\gamma > 0$, so that employment changes are positively correlated across regions within an industry (β) and positively correlated across industries within a region (γ). Statistical inference for this equation has to take account of non-independence of observations in the same region, as there may be regional shocks affecting all business in a

²² In light of the earlier discussion suggesting that, from a policy perspective, there may be more interest in differences between locally- and non-locally owned establishments *without* conditioning on characteristics such as size, we confirmed that the main and interaction effects of shocks were insensitive to excluding the establishment- and firm-size controls, though the local-ownership-category main effects (not the subject of our analysis) were sensitive to the inclusion of these controls.

region; furthermore, the non-independence need not only be contemporaneous, as the region specific shocks could be serially correlated. The same has to be considered with respect to industry-specific shocks. To obtain standard errors robust to all these forms of non-independence, we cluster the standard errors at the area level and at the industry level. Because these two dimensions of clustering are non-nested we use multi-way clustering by area and industry, following Cameron et al. (2006).

The key question is whether the effects of industry-specific or region-specific shocks are different when an establishment is locally owned. To test this, we include a vector of variables indicating whether establishment i is “locally owned,” and if so which type; as explained above, “local ownership” covers (1) single-establishment firms, (2) headquarters, and (3) locally-owned establishments.. Denote this vector LO_{it} . Then we augment the regression model to be:

$$(3) \quad Y_{ijst} = \alpha + \beta \{ \sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t} \} + \gamma \{ \sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t} \} + LO_{it} \theta + LO_{it} \cdot \{ \sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t} \} \lambda_1 + LO_{it} \cdot \{ \sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t} \} \lambda_2 + X_{it} \delta + \eta_t + \varepsilon_{ijst} .$$

This equation adds both the main and interactive effects. The main effects (θ) may be non-zero if, for example, locally-owned business are more likely to close, grow more slowly, etc. But the key parameters are λ_1 and λ_2 , which capture whether shocks have differential effects depending on local ownership.

The effect of local ownership on employment could be asymmetric with respect to shocks, so we augment the regression model to estimate separate interactions for upward and downward shocks. We define $I_{jt} = 1$ if $\{ \sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t} \} > 0$ (that is, if the industry-level shock is positive), and 0 otherwise. Similarly, we define $R_{st} = 1$ if $\{ \sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t} \} > 0$, and 0 otherwise. Then allowing asymmetric effects in both the main and interacted effects of the aggregate industry-specific and region-specific shocks, the regression model for employment changes becomes:

$$\begin{aligned}
(4) \quad Y_{ijst} = & \alpha + LO_{it}\theta + \beta^U \{ \sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t} \} \cdot I_{jt} + \gamma^U \{ \sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t} \} \cdot R_{st} \\
& + LO_{it} \cdot \{ \sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t} \} \cdot I_{jt} \lambda_1^U + LO_{it} \cdot \{ \sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t} \} \cdot R_{st} \lambda_2^U \\
& + \beta^D \{ \sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t} \} \cdot (1 - I_{jt}) + \gamma^D \{ \sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t} \} \cdot (1 - R_{st}) \\
& + LO_{it} \cdot \{ \sum_{\tilde{s}, \tilde{s} \neq s} Y_{j\tilde{s}t} \} \cdot (1 - I_{jt}) \lambda_1^D + LO_{it} \cdot \{ \sum_{\tilde{j}, \tilde{j} \neq j} Y_{j\tilde{s}t} \} \cdot (1 - R_{st}) \lambda_2^D \\
& + X_{it} \delta + \eta_t + \varepsilon_{ijst} .
\end{aligned}$$

In this equation, the U and D subscripts indicate that the parameters capture the effects of upward and downward shocks to employment. We do not have any presumption there is any asymmetry in the response of local employment in the industry to aggregate industry-specific or region-specific shocks. Nonetheless, we want to allow for this possibility to ensure that we do not find spurious evidence of differences in employment responses associated with local ownership. Moreover, the hypotheses discussed in the literature are primarily concerned with whether negative shocks have less of an effect on local employment when local ownership is higher, so that $\lambda_1^D < 0$ and $\lambda_2^D < 0$. We do not have any presumption that λ_1^U and λ_2^U differ from zero, since it is not clear why local ownership would affect the response to positive shocks. However, if local owners get positive externalities from increasing employment, then employment at locally-owned establishments may respond more strongly to positive shocks. Some additional refinements to the analysis are discussed after we describe the core empirical results.

VI. Empirical Results

VI.1. Basic Findings

We first look at how establishment-level employment changes are related to industry- and region-specific shocks. We will then interact these shocks with the local ownership variables. Next, we test for asymmetric effects. All of our regressions include as controls year fixed effects,

categorical dummies for establishment and firm size, and the local industry location quotient. We always report standard errors with multi-way clustering on industry and region, and generally weight the estimates by establishment size (or firm size where necessary, as explained below).²³ The unit of observation is always the establishment-year.

Prior to assessing the effect of local ownership on employment growth – which is the goal of the paper – we confirm that our measures of industry and regional shocks are correlated with establishment-level growth. Table 3, column 1, shows the results from a regression of employment growth on industry and region shocks only, as well as the control variables (equation (2)). The coefficients on both the industry-specific shock (growth in the establishment’s industry, excluding the establishment’s industry-region cell) and the region-specific shock (growth in the establishment’s region, again excluding the establishment’s industry-region cell) are positive and statistically significant. The magnitude of the coefficient of the industry-specific shock is more than three times the magnitude of the region-specific shock, so establishment growth is more sensitive to industry shocks than to regional shocks, aggregating across all industries.²⁴

Our main question of interest is how local ownership interacts with shocks in affecting employment growth, and our baseline results in Table 3, columns 2a-2d show that some types of local ownership mitigate the effect of shocks. These four columns are the output of a single regression of the two types of shocks interacted with dummies for three local-ownership categories described above (equation (3)); the omitted category is non-locally-owned establishments. Column 2a shows the main effects of the shocks on employment for the omitted

²³ We weight by establishment size in most of our estimations to make the estimates representative of what happens to workers in different kinds of establishments.

²⁴ The standard deviation of industry shocks is .040, compared with .035 for regional shocks; for a standard-deviation shock, the effect of industry shocks on employment growth is even larger relative to the effect of regional shocks.

category: shocks have a positive, statistically significant effect on employment in these establishments. For headquarters (column 2b), the effect of both types of shocks relative to the non-locally-owned establishments is negative and statistically significant. The magnitudes of these interactions are a bit larger in absolute value than the shocks' main effects (column 2a), so the net effect of shocks on employment in headquarters establishments is not positive: the net effect of the industry shock is not significantly different from zero, and the net effect of the regional shock is different from zero only at the 10% level of significance. The effects of the shocks on employment growth for locally-owned establishments are not significantly different from the non-locally-owned establishments (column 2c). For single-establishment firms, the effect of industry shocks on employment growth are not significantly different than for non-locally-owned establishments, but the statistically significant negative coefficient on the interaction with regional shocks means that the effect of regional shocks on single-establishment firms is muted, and nearly completely offsets the shock's main effect as it does for headquarters (column 2d); the net effect of regional shocks on single-establishment firms is not statistically significantly different from zero.²⁵

These results in Table 3, columns 2a-2d are our baseline results; they suggest that the relationship between local ownership and employment growth depends on the type of local ownership. Employment in headquarters is essentially unaffected by industry or regional shocks. Locally-owned establishments respond to shocks no differently than non-locally-owned establishments (both are, by definition, are in multi-establishment firms). The evidence for single-establishment firms is mixed: they do not respond differently to industry shocks than do

²⁵ Comparing the coefficients on headquarters and single-establishment firms (column 2b vs. column 2d, Table 3), the difference in the industry-shock interactions is strongly statistically significant, and the difference in the regional-shock interactions is statistically significant at the 10% level.

non-locally-owned establishments, while they are less affected by regional shocks than non-locally-owned establishments are.

We next consider whether shocks interact with local ownership asymmetrically by separating upward and downward industry-specific and region-specific shocks.²⁶ As shown in Table 4, column 1, three of the four shocks are positively correlated with establishment-level employment growth, as we would expect; the only exception is that the effect of upward industry-specific shocks on employment growth is negative though not statistically significantly different from zero.²⁷ Turning to the interaction with local ownership, the coefficient of the shock interactions for headquarters is negative for all four types of shocks, and statistically significant at the 5% or 1% level for all but downward industry-specific shocks (Table 4, column 2b). The interaction for locally-owned establishments is not different from non-locally-owned establishments for any of the four shocks (Table 4, column 2c). For employment in single-establishment firms, the evidence on regional shocks is similar to that in Table 3; the effects of regional shocks in both directions are muted for these firms, with the estimates significant at the 5% or 10% level. The evidence for industry shocks, however, is different from when we treated shocks symmetrically in Table 3. The coefficient on the upward industry shock interaction is still negative (and rather large). But the coefficient on the downward industry shock interaction is positive, relative to non-locally-owned establishments. This one positive coefficient is notable since downward industry shocks are arguably the shock with the greatest policy importance: industry shocks, relative to regional shocks, are more likely to be exogenous to local policy decisions, and policy generally seeks to cushion the effect on society of downward shocks more

²⁶ Keep in mind that – regardless of the direction of the shock – positive coefficients on the interactions between shocks and establishment category mean that effect of the shock is amplified in those establishments, whereas negative coefficients mean that the effect of the shock is muted.

²⁷ It may be that our exclusion of births leads to this surprising result if a large share of employment growth during positive industry shocks is in new establishments.

than of upward shocks. Still, three of the four asymmetric shock interactions are negative for single-establishment firms, so the general pattern remains that employment in single-establishment firms tends to be more stable than in non-locally-owned establishments.

VI.2. Extensions

To better isolate the independent effects of ownership, we estimate models including firm-year fixed effects. These models allow for firms to be affected by idiosyncratic (year-to-year) shocks, and ask how – net of these shocks – employment changes vary across establishment types. As such, the evidence from these specifications may be most informative with regard to understanding the firm behavior that underlies different effects depending on local ownership and the type of local ownership, although this evidence may be less significant from the perspective of policy. The general story remains largely unchanged.

Single-establishment firms have, by definition, only one establishment at a point in time, so they cannot contribute to the firm-year fixed effects estimates. They are therefore excluded and the number of observations falls from 183 million to 24 million. Columns 1a-1c of Table 5 report estimates of equation (3) (Table 3) for this subsample. The results are mostly similar, except that the coefficients on establishments in multi-establishment firms headquartered locally, which were not significant in Table 3, column 2c, are negative for industry shocks and positive for region shocks in Table 5, column 1c. Table 3 was weighted by establishment size, whereas Table 5 was weighted by firm size.²⁸ The estimates including firm-year fixed effects are

²⁸ Because we view these estimates as testing how firms respond to shocks differentially across their establishments, we weight by firm size to make the estimates representative of firms. Because it is not feasible to estimate the model with firm-year fixed effects, we estimate the model using the within-group estimator. With a fixed-effects within-group estimator, the degrees of freedom have to be reduced by the number of groups for which means are estimated, in order to get the asymptotics right (since the number of groups goes to infinity); this is standard. With clustered standard errors, in contrast, this adjustment is not needed. Thus, when we cluster on the fixed effect, or on something that nests the fixed effect, this degrees of freedom adjustment is not used; that is how Stata, which we use, works. In this analysis, however, we are clustering on industry and region, whereas observations on firms can span multiple industries. In that case the fixed effects and the clusters are non-nested. In such cases, a degrees of

reported in columns 2a-2c. As before, the shock interactions are negative and statistically significant for headquarters, for both types of shocks (Table 5, column 2b). For locally-owned establishments, the effect of regional shocks on employment, relative to non-locally-owned establishments, is not significantly different from zero, and the effect of industry shocks is marginally significant in the direction of muted effects.

The firm-year fixed-effects specification is, in part, a robustness check on our baseline results and confirms that unobserved firm differences (time-varying or not) are not driving our results. Including firm-year fixed-effects also has the intuitive appeal of approximating business owners' decision-making process over how to allocate employment changes across establishments within a firm. We interpret these results to mean that owners of multi-establishment firms respond to shocks not by changing headquarters employment but rather by changing employment in non-headquarters establishments, without much regard to whether the non-headquarters establishments are in the same region as headquarters – that is, locally owned.

For our final analysis, we estimate equation (3) separately for the most and least geographically concentrated industries. Some firms produce for a national or global market, and for them local demand should matter less, so industry-specific shocks should have stronger effects than region-specific shocks. Other firms produce for a local market, and region-specific shocks might affect their employment more than industry-specific shocks. Disaggregating the analysis to test whether this holds true in our data is valuable as a check on the validity of our analyses. In particular, if we are truly identifying industry and region shocks, the pattern of employment changes in response to these shocks should conform with our expectations.

freedom adjustment for the fixed-effects estimation is still needed, leading to larger (and hence more conservative) standard errors; we implement using the “dfadj” option along with the “cluster” option in Stata’s “xtreg” module. (And to do the multi-way clustering, we add and subtract three difference variance-covariance matrices, as in Cameron et al. (2006).)

In the absence of establishment-level or firm-level information on how local or national a business's customers are, we proxy using industry-level geographic concentration, measured with the Ellison-Glaeser (1997) index. We assume that geographic concentration is correlated with serving a national (or global) market rather than a local market while acknowledging that geographic concentration also depends on other industry characteristics like reliance on natural resource inputs, the potential for labor pooling and knowledge spillovers, and so on. The most concentrated industries, such as motion pictures, apparel manufacturing, and oil and gas extraction, are generally thought of as producing for national or global markets; the least concentrated industries, such as personal and laundry services, furniture stores, and food service and drinking places, appear to cater to local customers.

Tables 6 and 7 present our results for the top and bottom quartile of industries, ranked by the Ellison-Glaeser index. For the most concentrated industries, employment growth is positively correlated with both industry and region shocks; as we would expect, industry shocks have a larger effect on employment growth than region shocks do (Table 6, column 1). Once again, the shock interaction for headquarters is negative for both types of shocks (Table 6, column 2b). The industry shock interaction is positive for locally-owned establishments and negative for single-establishment firms; the region shock interaction is not statistically significant for either type of establishment (Table 6, columns 2c and 2d). For the least concentrated industries, employment growth is positively correlated with region shocks but uncorrelated with industry shocks (Table 7, column 1), again as we would expect. The region shock interactions are again negative for headquarters and not significant for locally owned establishments or for single-establishment firms. The industry-shock interaction is insignificant for headquarters, but we place less weight

on this result since industry shocks are not positively correlated with employment growth for these least concentrated industries.

VII. Discussion and Conclusions

We assess whether locally-owned businesses provide more stable employment in the face of the inevitable industry and regional economic shocks that buffet local economies. The shares of employment in single-establishment firms, headquarters, locally-owned establishments, and non-locally-owned establishments are similar in 1992 and 2006, though over our study period the share in non-locally-owned establishments rises and then falls back to its starting level; no one type of establishment contributes significantly more to employment growth over the period than others. The effect of shocks on employment growth, though, differs by establishment type. The evidence consistently indicates that employment at headquarters establishments is very stable; industry and regional shocks that affect other establishments have virtually no effect on headquarters employment.

For other types of local ownership, shocks have mixed effects on employment. Locally-owned establishments (in multi-establishment firms) do not show significant differences from non-locally owned establishments (in multi-establishment firms) in most specifications. For single-establishment firms, shocks are muted, but somewhat less so than for headquarters establishments. One exception is for downward industry shocks, implying that employment in the typical single-establishment firm contracts *more* than in the typical non-locally owned establishment when its industry shrinks. Since one goal of policies encouraging local ownership is presumably to prevent employment losses in the face of negative shocks, this exception is important from a policy perspective, as it means that local ownership, *per se*, does not cushion localities from negative shocks to the industries of locally-owned, single-establishment firms.

What do these results imply for the arguments made for local ownership? The externality argument – that local owners take into account the effect on the community in making employment decisions – cannot be the whole story. Although headquarters employment is stable with regard to shocks, employment at single-establishment firms is less so, and locally-owned establishments of multi-establishment firms are no different from non-locally-owned establishments of such firms. Moreover, the externality argument should be more compelling with respect to downward shocks; but we find that with downward industry shocks, single-establishment firms contract their employment even more than non-locally-owned establishments, and much more than headquarters. Furthermore, although the externality argument is consistent with stable headquarters employment, if businesses considered the effect on employment decisions on their local communities, we would expect to see employment in locally-owned, non-headquarters establishments to be more stable than employment in non-locally-owned establishments. But there is, in most specifications, no significant difference between locally-owned and non-locally owned establishments. The externality argument is consistent with our findings only if we narrow the argument to mean that owners consider the interests not of their locality, but rather of only the employees who work alongside them at headquarters.

Explanations other than the externality argument could explain the stability of headquarters employment, however. It may be that headquarter functions are fixed costs with respect to the size of the firm, and when shocks hit, firms adjust only the variable factors of production, which are located in non-headquarters establishments. This fixed-cost explanation is consistent with the similar employment response to shocks in locally-owned and non-locally owned establishments. It is also consistent with the employment in single-establishment firms

being less stable with regard to shocks than that of headquarters firms but more stable than locally-owned and non-locally owned establishments in multi-establishment firms, since single-establishment firms combine both fixed-cost and variable-cost functions in the same establishment. From the perspective of stable local employment, single-establishment firms appear to represent a middle ground between the stable employment of headquarters and the shock-responsive employment of locally-owned and non-locally-owned establishments of multi-establishment firms.

Without more detailed micro-data, we cannot say anything more definitive about the reasons for employment stability in headquarters and, to a lesser extent, in single-establishment firms. But we can conclude that the externality argument on its own does not fit the facts about how local ownership interacts with shocks to affect employment growth. It is also clear that local ownership is a broad term that covers several types of establishments, some of which exhibit very stable employment and others of which do not. If stable local employment is a policy goal, then encouraging local ownership may not achieve it – especially if policymakers consider all types of local ownership equally likely to lead to stable employment. Attracting or retaining headquarters of multi-establishment firms or, to a lesser extent, single-establishment firms, would have a better chance of stabilizing local employment over the business cycle. Yet, the costs to localities of attracting or retaining businesses can be high per job created or saved. Moreover, the stability of employment at headquarters establishments may provide little benefit to lower-wage workers who are less likely to be employed at such establishments.²⁹ Thus, our conclusion that headquarters and single-establishment firms have more stable employment begs

²⁹ We cannot observe workers' skill levels in the NETS. However, Lichtenberg and Siegel (1990) report that, in Census data on the manufacturing sector, average pay is about 50% higher in "auxiliary establishments" – which include headquarters – than in production establishments.

the question of whether the benefits to a community of stable employment are worth the uncertain, and possibly high, costs.

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Table 1: Employment by establishment type (percent), by year

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Single-establishment firms	50.2	50.3	50.1	50.0	50.0	49.1	48.6	46.9	46.6	47.9	47.9	48.1	47.7	48.9	50.2
Headquarters	10.4	10.3	10.4	10.5	10.7	10.8	10.8	10.9	11.0	10.7	10.9	10.8	10.7	10.3	10.2
Locally-owned establishments	13.7	13.8	13.9	13.9	13.5	13.9	14.0	14.5	14.3	14.0	14.1	14.1	14.2	13.9	13.6
Non-locally-owned establishments	24.2	23.9	23.8	23.9	24.1	24.3	24.7	25.7	26.0	25.3	25.3	25.0	25.4	24.8	23.9
Not categorized*	1.5	1.7	1.9	1.7	1.7	2.0	2.0	2.1	2.1	2.1	1.9	2.0	1.9	2.0	2.1

*“Not categorized” includes (1) establishments missing HQ identifiers, (2) establishments having HQ identifiers that are not valid DUNS numbers, and (3) single-establishment firms where HQ identifier does not equal the establishment DUNS number.

Table 2: Descriptive statistics by establishment type

	<i>Share of employment</i>	<i>Share of establishments</i>	<i>Average establishment size</i>	<i>Average one-year employment change*</i>
Single-establishment firms	48.8%	86.4%	6	-0.139
Headquarters	10.6%	2.2%	51	-0.079
Locally-owned establishments	14.0%	3.7%	40	-0.135
Non-locally-owned establishments	24.7%	7.0%	37	-0.150
Not categorized*	1.9%	0.7%	29	-0.149

“Not categorized” includes (1) establishments missing HQ identifiers, (2) establishments having HQ identifiers that are not valid DUNS numbers, and (3) single-establishment firms where HQ identifier does not equal the establishment DUNS number.

*“Average one-year employment change” includes only establishments that existed at the start of the one-year period and therefore excludes establishment births. This column is weighted by establishment size.

Table 3: Baseline specification: Local ownership and employment change:

	Shocks (main effect)	Establishment category			
		Shocks (main effect)	Headquarters	Locally-owned establishments	Single- establishment firms
	(1)	(2a)	(2b)	(2c)	(2d)
Industry-specific shock	0.516 (0.189)***	0.481 (0.099)***	-0.514 (0.103)***	0.025 (0.111)	0.158 (0.228)
Region-specific shock	0.143 (0.027)***	0.345 (0.059)***	-0.479 (0.077)***	-0.022 (0.129)	-0.283 (0.093)***
				Interacted with shocks:	
			0.117 (0.009)***	0.031 (0.014)**	0.042 (0.008)***
N	184,274,272	183,035,220			

Column 1 is the output from a single regression; columns 2a-2d are the output from a single regression.

The dependent variable is the employment growth rate, measured as the one-year change in employment divided by the average of start-year and end-year employment.

The unit of observation is the establishment-year. Models include year fixed effects and dummy variables to control for establishment size, firm size, and the location quotient for the industry-region of the establishment.

Standard errors are below coefficients estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1-, 5-, or 10-percent level.

Estimates are weighted by establishment employment.

Table 4: Asymmetric shocks: Local ownership and employment change

	Shocks (main effect)	Establishment category			
		Shocks (main effect)	Headquarters	Locally-owned establishments	Single- establishment firms
	(1)	(2a)	(2b)	(2c)	(2d)
				Interacted with shocks:	
Industry-specific shock (Upward)	-0.192 (0.133)	0.050 (0.110)	-0.524 (0.219)**	-0.295 (0.216)	-0.242 (0.112)**
Industry-specific shock (Downward)	1.264 (0.195)***	0.900 (0.138)***	-0.545 (0.301)*	0.460 (0.386)	0.617 (0.217)***
Region-specific shock (Upward)	0.175 (0.041)***	0.311 (0.063)***	-0.297 (0.095)***	0.030 (0.086)	-0.169 (0.074)**
Region-specific shock (Downward)	0.093 (0.047)**	0.306 (0.100)***	-0.716 (0.149)***	-0.052 (0.204)	-0.304 (0.118)***
				Main effects:	
			0.111 (0.011)***	0.039 (0.017)**	0.054 (0.006)***
N	184,274,272	183,035,220			

Column 1 is the output from a single regression; columns 2a-2d are the output from a single regression.

The dependent variable is the employment growth rate, measured as the one-year change in employment divided by the average of start-year and end-year employment.

The unit of observation is the establishment-year. Models include year fixed effects and dummy variables to control for establishment size, firm size, and the location quotient for the industry-region of the establishment.

Standard errors are below coefficients estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1-, 5-, or 10-percent level.

Estimates are weighted by establishment employment.

“Upward” and “downward” shocks refer to whether the shock is positive or negative, as explained in the text.

Table 5: Multi-establishment firms: Local ownership and employment change

	Without firm-year fixed effects			With firm-year fixed effects		
	Establishment category			Establishment category		
	Shocks (main effect)	Headquarters	Locally-owned establishments	Shocks (main effect)	Headquarters	Locally-owned establishments
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
	Interacted with shocks:			Interacted with shocks:		
Industry-specific shock	0.547 (0.086)***	-0.608 (0.076)***	-0.495 (0.155)***	0.189 (0.095)**	-0.537 (0.120)***	-0.266 (0.156)*
Region-specific shock	0.132 (0.045)***	-0.301 (0.104)***	0.210 (0.089)**	0.117 (0.047)**	-0.211 (0.100)**	0.069 (0.121)
	Main effects:			Main effects:		
		0.114 (0.009)***	0.011 (0.009)		0.126 (0.013)***	0.006 (0.005)
N	24,106,231			24,106,231		

Columns 1a-1c are the output from a single regression; columns 2a-2c are the output from a single regression.

The dependent variable is the employment growth rate, measured as the one-year change in employment divided by the average of start-year and end-year employment.

The unit of observation is the establishment-year. Models include firm-year fixed effects and dummy variables to control for establishment size and the location quotient for the industry-region of the establishment.

Standard errors are below coefficients estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1-, 5-, or 10-percent level.

Estimates are weighted by firm employment.

Table 6: Top quartile of industries by geographic concentration: Local ownership and employment change

	Shocks (main effect)	Establishment category			
		Shocks (main effect)	Headquarters	Locally-owned establishments	Single- establishment firms
	(1)	(2a)	(2b)	(2c)	(2d)
Industry-specific shock	0.319 (0.116)***	0.443 (0.140)***	-0.530 (0.152)***	0.270 (0.103)***	-0.338 (0.138)**
Region-specific shock	0.158 (0.048)***	0.235 (0.056)***	-0.482 (0.119)***	0.130 (0.137)	-0.131 (0.074)*
				Interacted with shocks:	
			0.090 (0.010)***	-0.012 (0.004)***	0.032 (0.007)***
N	24,380,324	24,101,896			

Column 1 is the output from a single regression; columns 2a-2d are the output from a single regression.

The dependent variable is the employment growth rate, measured as the one-year change in employment divided by the average of start-year and end-year employment.

The unit of observation is the establishment-year. Models include year fixed effects and dummy variables to control for establishment size, firm size, and the location quotient for the industry-region of the establishment.

Standard errors are below coefficients estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1-, 5-, or 10-percent level.

Estimates are weighted by establishment employment.

Table 7: Bottom quartile of industries by geographic concentration: Local ownership and employment change

	Shocks (main effect)	Establishment category			
		Shocks (main effect)	Headquarters	Locally-owned establishments	Single- establishment firms
	(1)	(2a)	(2b)	(2c)	(2d)
				Interacted with shocks:	
Industry-specific shock	-0.027 (0.134)	0.058 (0.108)	-0.078 (0.362)	-0.306 (0.109)***	-0.044 (0.157)
Region-specific shock	0.105 (0.031)***	0.179 (0.068)***	-0.429 (0.142)***	0.008 (0.144)	-0.015 (0.068)
			Main effects:		
			0.115 (0.015)***	0.052 (0.014)***	0.048 (0.010)***
N	41,999,417	41,737,923			

Column 1 is the output from a single regression; columns 2a-2d are the output from a single regression.

The dependent variable is the employment growth rate, measured as the one-year change in employment divided by the average of start-year and end-year employment.

The unit of observation is the establishment-year. Models include year fixed effects and dummy variables to control for establishment size, firm size, and the location quotient for the industry-region of the establishment.

Standard errors are below coefficients estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1-, 5-, or 10-percent level.

Estimates are weighted by establishment employment.