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Does local business ownership insulate cities from economic shocks? ☆

Jed Kolko [a,1], David Neumark [b,*,2]

[a] Public Policy Institute of California, USA
[b] University of California, Irvine, USA

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ABSTRACT

We assess a prominent argument for local economic policies that favor locally-owned businesses – namely, that locally-owned firms are more likely to internalize the costs to the community of decisions to reduce employment and hence help to insulate cities from adverse economic shocks. We test this argument by examining how establishment-level employment responses to economic shocks are affected by establishment ownership. We find evidence that some types of local ownership do insulate regions from economic shocks, although the clearest benefits do not come from small, independent businesses, but instead from corporate headquarters and, to a lesser extent, from small, locally-owned chains.

1. 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 for 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.[3] The same would hold true for single-establishment firms relative to multiple-establishment firms with headquarters elsewhere. In anticipation of more moderate downward adjustments to adverse shocks, the same firms would likely also moderate upward adjustments to positive shocks, leading to more stable employment overall. To assess this hypothesis, we examine how the establishment-level employment response to economic 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 test whether locally-owned businesses have diminished responses to economic shocks generally, and in particular whether they reduce employment less in response to adverse shocks. We use data from the National Establishment

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* Corresponding author. Address: Department of Economics, UCI, 3151 Social Science Plaza, Irvine, CA 92697, USA. Fax: +1 949 824 2182.
E-mail addresses: kolko@ppic.org (J. Kolko), dneumark@uci.edu (D. Neumark).
[1] Address: 500 Washington St., Suite 600, San Francisco, CA 94111, USA.
[2] Also a Bren Fellow at PPIC, a Research Associate of the NBER, and a Research Fellow at IZA.

[3] 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; aside from demand shocks, industry employment shocks seem more likely to reflect things such as changes in input prices, and regional employment shocks to reflect changes in local or state policies, although the distinction is not hard and fast.

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Time Series, covering the entire United States for the period 1992–2006.

2. 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.[4] The ordinance barred such establishments from certain locations in the city, and required 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."[5] 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 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.[6] 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 bar big-box retailers from opening stores, at least in their standard format.[7] 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.[8] Even in the absence of ordinances that ban formula retail or impose store size caps, local planning review processes can halt or slow the entry of large stores for environmental, traffic, and other reasons.[9]

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 and variety; 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 on 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, which 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 Wal-Mart pulls more customers to the host town, hurts its local competitors, but benefits some other local businesses that do not directly compete with it.[10] We are not aware of academic research on the issues of local spending and innovation, although there are some consulting studies supporting the arguments underlying policies favoring local ownership (Civic Economics, 2004, 2007); however, these studies were commissioned by groups supporting local ownership policies.[11] We have some reservations regarding 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 variety or diversity seems compelling, although some market failure must be invoked to explain why chains would win out over local businesses in the competition for consumer spending.[12]

In this paper, however, we focus on 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."[13] 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 business.[14] 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 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.

[4] See http://www.newrules.org/retail/rules/formula-business-restrictions/formula-business-restrictions-san-francisco-ca (viewed May 6, 2009).

[5] San Francisco City Planning Code Section 703.3. See http://www.municode.com/resources/gateway.asp?pid=14139&sid=5 (viewed May 6, 2009).

[6] See http://www.newrules.org/retail/rules/formula-business-restrictions (viewed May 6, 2009).

[7] See http://www.newrules.org/retail/rules/store-size-caps (viewed May 6, 2009) for a list of these ordinances.

[8] 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).

[9] One example is the long-running battle over a proposed IKEA store in Somerville, an inner suburb of Boston. See "Fear of Gridlock Hangs Over IKEA Pact," *Boston Globe*, September 9, 2007.

[10] However, overall the entry of Wal-Mart stores reduces retail employment (Neumark et al., 2008). 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).

[11] See http://www.andersonvilledevcorp.org/ (viewed December 22, 2008), and http://sfloma.org/ (viewed December 22, 2008).

[12] One possibility is suggested by models like that in Spence (1976), in which monopolistically competitive firms facing fixed costs of entry will, in equilibrium, tend to provide varieties for which there are larger clusters of consumers, even though there are other consumers willing to pay a price above marginal cost for other varieties. Moreover, the varieties that the market provides are not necessarily those that add the most to consumer surplus. (For an application to the newspaper industry, see George and Waldfogel, 2003.)

[13] See http://www.newrules.org/retail/platform.html (viewed December 22, 2008).

[14] A related question about internalizing costs to the local community has been asked with respect to environmental issues – specifically, whether plants owned by companies headquartered out of state emit more pollutants (Grant et al., 2004).

The worldview is local. To lay off workers in slack times, for example, would mean taking jobs from relatives, friends, and neighbors" (p. 1311).[15]

Along a somewhat different vein, Anderson and Barkley (1982) do not focus on externality-related issues, but instead on the underlying economics of the firm. 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.[16] In a related argument, Caves and Porter (1976) suggest that the ability of top management to place employees displaced from a closed establishment elsewhere in the enterprise may also make establishments of multi-unit firms more susceptible to closing.[17] On the other hand, Anderson and Barkley point out that larger multi-establishment firms, because of both their 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.[18]

Local ownership policies, and claims that they stabilize local employment and insulate localities from adverse economic shocks, beg the question of whether stability is desirable. Individual workers (and the policymakers who represent them) might prefer stable local employment over fluctuating employment, controlling for long-run job growth, if they are risk-averse or liquidity constrained. And of course local ownership may deliver benefits unrelated to labor market outcomes. But the economic implications of stable local employment are not unambiguous; it is possible that stability could discourage workers from moving between establishments or starting new establishments, which could affect innovation, and more generally retard the process of workers moving to their most productive use.[19] We do not assess these possibilities in this paper. Because of both the ambiguous consequences of employment stability, and the other potential benefits (or costs) of local ownership,[20] stable local employment should not be the only criterion on the basis of which to evaluate local ownership policies.

3. Existing research

We are not aware of any research that studies directly the effects of public policies favoring local businesses. There is limited evidence on how local ownership impacts the stability of employment. The research focuses mainly on plant closings (exit) in the manufacturing sector and does not look at responses to economic shocks.[21]

Anderson and Barkley (1982) study data on manufacturing plants employing 20 or more workers in non-urban areas of Iowa, in the 1965–1975 period. They used directories of Iowa manufacturers to track plant closings, and also surveyed community leaders, bankers, company executives, and employees. Estimates of probit models for plant closings indicate that branch plants were significantly more likely to close than were non-branch plants.[22] However, this relationship is only statistically significant for plants with 100 or fewer employees.[23] 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.

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 the US Small Business Administration's Small Business Database on 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 results that tend to point in the opposite direction.[24] However, based on his results, Audretsch suggests 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 may be accounted for by the smaller initial size of these establishments.[25] Similar conclusions are reached in more recent research by Bernard and Jensen (2007), based on data from the Longitudinal Research Database covering 1987–1997. 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 (age, size, capital intensity, TFP, etc.), the relationship is reversed, with single-unit establishments less likely to close.

[15] 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 restrictions on such decisions (Macey, 1989).

[16] Audretsch (1994) offers a similar version of this argument: "The owners of independent establishments may tend to have a lower opportunity cost and therefore are willing to accept a lower rate of return than is set for subsidiaries of multi-plant enterprises" (p. 130). There is a larger theoretical literature exploring issues of plant exit from declining industries, and whether one can make predictions about whether a firm with more establishments will close plants before a firm with fewer establishments (e.g., Reynolds, 1988). Although there are some concrete predictions for simple settings, Whinston (1988) argues that it is very difficult to make strong predictions.

[17] This argument may also have an externality flavor, although it acts in the opposite direction; specifically, to the extent that top managers internalize the costs of adverse decisions for other managers, they may be more willing to close an establishment when those managers can be re-employed elsewhere.

[18] 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).

[19] There are some parallels to the debate on homeownership; there are some reasons why homeownership can positively impact communities yet have negative individual employment effects and possibly also negative aggregate employment effects. For example, DiPasquale and Glaeser (1999) and Glaeser et al. (2002) show that homeownership raises investments in social capital, such as voting and belonging to non-profit organizations. Coulson and Fisher (2009) review theories of homeownership and labor market outcomes, some of which predict that homeowners' lower mobility could hurt individual and aggregate labor market outcomes; empirically, they find that homeownership has a mixed effect on labor market outcomes for the individual and positive effects in the aggregate.

[20] For example, Hausman and Leibtag (2005) document large food price reductions for consumers from Wal-Mart entry.

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

[22] Anderson and Barkley 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.

[23] 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. 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).

[24] This is not their focus. Instead, they emphasize the age-exit and size-exit relationships (and the age-growth and size-growth relationships more generally), and incidentally report these results separately for single plants and plants of multi-establishment firms. More specifically, they report separate models for these two types of plants, with controls for current size and age categories. Although hypothesis tests for differences in exit rates for the two types of plants are not reported, for most cells the estimates point to higher exit rates for single plants. (See their Table 2 and the discussion on p. 694.) This is especially true for the larger establishments, which are more significant in terms of their share of employment.

[25] Audretsch does not test this directly, but reports that in his model for exits start-up size is negatively related to exit, and exit rates are lower for single plants. Coupled with evidence that start-up size is much smaller for single plants, it is at least plausible that if start-up size were omitted from his model the sign of the differential for single plants would become positive; at a minimum, it would clearly be upward biased.

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. Unlike the papers already discussed, she includes headquarter establishments of multi-plant firms as a separate category and finds that headquarters – unlike branches and subsidiaries – are no more like to close than independents.

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 (as in Audretsch's (1994) findings for the manufacturing sector) 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 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.[26]

Aside from this issue, the existing research does not speak directly to the question of how locally-owned versus other establishments respond differentially to economic shocks, for several reasons. First, the literature looks at branches versus independents, plus headquarters in the case of Howland (1988), but these distinctions are not synonymous with local ownership. Specifically, branch plants can be locally owned if they are in the same locality as the firm's headquarters. Second, the literature does not extend beyond the manufacturing sector. Third, without looking specifically at responses to economic shocks, this evidence on exit rates is hard to interpret. Fourth, the literature tends to look at exit rates, yet employment changes that do not involve exit might also be affected by local ownership and of course matter greatly for labor market outcomes.

4. Descriptive evidence on local ownership

We begin our analysis 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 United States over the period 1992–2006.[27]

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";
3. a non-headquarter establishment of a multi-establishment firm in the same region as the firm's headquarters, hereafter "locally-owned establishment"[28]; 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.[29]

We define local ownership based on metropolitan regions. Our regions consist of metropolitan areas plus one additional region per state consisting of all non-metropolitan counties in the state.[30] 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, but not if its 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%), fluctuating somewhat in the intervening years, as shown in Table 1.[31] 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.[32]

[26] In contrast, the conditional results are of more interest for understanding the effect of firm structure on exit (and other employment adjustments) of plants, as this is inherently a ceteris paribus question (Bernard and Jensen, 2007, p. 196).

[27] For more information on the NETS, including assessment of the data quality, see Appendix A.

[28] The same label could apply to single-establishment firms, but we use this label to refer only to locally-owned establishments of multi-establishment firms. Later, we distinguish between locally-owned establishments of large versus small firms.

[29] One reason why the HQ DUNS might not exist as a DUNS number elsewhere in the database is because an establishment is foreign owned. Because the NETS covers only US 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 (US) establishment in the database. It is unclear how much foreign ownership accounts for the establishments we could not categorize.

[30] 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.

[31] 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.

[32] This share may be higher in the NETS than in other data sources for reasons highlighted in Neumark et al. (2007) and discussed in Appendix A. In particular, the NETS picks up more very small establishments (and hence very small firms) than other establishment-level datasets.

Table 1
Employment by establishment type (%), 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[a]	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

[a] "Not categorized" includes: (1) establishments missing HQ identifiers, (2) establishments having HQ identifiers that are not valid DUNS numbers for other establishments in the NETS, and (3) single-establishment firms where HQ identifier does not equal the establishment DUNS number.

Table 2
Descriptive statistics by establishment type.

	Share of employment (%)	Share of establishments (%)	Average establishment size	Average 1-year employment change[a]
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[b]	1.9	0.7	29	−0.149

[a] "Average 1-year employment change" includes only establishments that existed at the start of the 1-year period and therefore excludes establishment births. This column is weighted by establishment size.
[b] "Not categorized" includes: (1) establishments missing HQ identifiers, (2) establishments having HQ identifiers that are not valid DUNS numbers for other establishments in the NETS, and (3) single-establishment firms where HQ identifier does not equal the establishment DUNS number.

Together, these latter three categories – the three types of locally-owned establishments – account for 73.4% of employment.[33] 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 than of employment. The average single-establishment firm has six employees, compared with 51 for headquarters, 40 for locally-owned establishments, and 37 for non-locally-owned establishments.

5. 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 1-year change in employment divided by the average of start-year and end-year employment.[34] 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 (Neumark et al., forthcoming), 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.[35] 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.[36] 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:

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

Initially we estimate this model pooling across industries, regions, and years, though we also estimate the 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 s 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.[37]

[33] 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.

[34] There can be other margins along which businesses adjust besides employment – such as hours. However, in the NETS all we can measure is employment. There is evidence that, in the US manufacturing sector, labor input adjustment is principally along the employment dimension, relative to hours or nominal wages (Houseman and Abraham, 1995; Kurre and Weller, 1989). Cho and Cooley (1994) suggest that for the US economy as a whole, about three-fourths of the total adjustment in hours over the business cycle comes through employment fluctuations, and one-quarter comes through adjustments in average hours of work.

[35] Births are least common for headquarter establishments; accordingly, the average (negative) employment change for headquarters is smaller in absolute value than for other types of establishments (Table 2), even though the overall rate of growth of employment in each type of establishment has been similar, as shown by the similar shares of employment by establishment type at the start and end of the sample period (Table 1).

[36] 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.

[37] 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 key results were insensitive to excluding the establishment- and firm-size controls.

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, to capture agglomeration economies that may lead to systematic differences in growth rates of an industry in a particular region. These are included in X_{it}.

Linearizing this equation and adding an error term, we get the regression model

$$Y_{ijst} = \alpha + \beta_I \left\{ \sum_{\tilde{s},\tilde{s}\neq s} Y_{\tilde{j}\tilde{s}t} \right\} + \beta_R \left\{ \sum_{\tilde{j},\tilde{j}\neq j} Y_{\tilde{j}st} \right\} + X_{ijst}\delta + \eta_t + \varepsilon_{ijst}. \quad (2)$$

We expect to find $\beta_I > 0$ and $\beta_R > 0$, so that employment changes are positively correlated across regions within an industry (β_I) and positively correlated across industries within a region (β_R).[38] 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 businesses in a 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 region 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, we distinguish three types of "local ownership": single-establishment firms, headquarters, and locally-owned establishments (of multi-establishment firms). Denote by LO_{it} the vector of dummy variables for these three types of establishments. Then we augment the regression model to be:

$$Y_{ijst} = \alpha + \beta_I \left\{ \sum_{\tilde{s},\tilde{s}\neq s} Y_{\tilde{j}\tilde{s}t} \right\} + \beta_R \left\{ \sum_{\tilde{j},\tilde{j}\neq j} Y_{\tilde{j}st} \right\} + LO_{it} \cdot \left\{ \sum_{\tilde{s},\tilde{s}\neq s} Y_{\tilde{j}\tilde{s}t} \right\} \lambda_I + LO_{it} \cdot \left\{ \sum_{\tilde{j},\tilde{j}\neq j} Y_{\tilde{j}st} \right\} \lambda_R + LO_{it}\theta + X_{ijst}\delta + \eta_t + \varepsilon_{ijst}. \quad (3)$$

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_I and λ_R, which capture whether shocks have differential effects depending on local ownership. If an element of λ_I, for example, is positive, then the industry shock has a larger effect, whether that shock is positive or negative.

Responses to employment shocks may differ with the direction of the shock, so we augment the regression model to estimate separate interactions for upward and downward shocks. We define $I^U_{jt} = 1$ if $\left\{ \sum_{\tilde{s},\tilde{s}\neq s} Y_{\tilde{j}\tilde{s}t} \right\} > 0$ (that is, if the industry-level shock is positive), and 0 otherwise. Similarly, we define $R^U_{st} = 1$ if $\left\{ \sum_{\tilde{j},\tilde{j}\neq j} Y_{\tilde{j}st} \right\} > 0$, 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:

$$\begin{aligned} Y_{ijst} = {} & \alpha + \beta^U_I \left\{ \sum_{\tilde{s},\tilde{s}\neq s} Y_{\tilde{j}\tilde{s}t} \right\} \cdot I^U_{jt} + \beta^U_R \left\{ \sum_{\tilde{j},\tilde{j}\neq j} Y_{\tilde{j}st} \right\} \cdot R^U_{st} \\ & + LO_{it} \cdot \left\{ \sum_{\tilde{s},\tilde{s}\neq s} Y_{\tilde{j}\tilde{s}t} \right\} \cdot I^U_{jt}\lambda^U_I + LO_{it} \cdot \left\{ \sum_{\tilde{j},\tilde{j}\neq j} Y_{\tilde{j}st} \right\} \cdot R^U_{st}\lambda^U_R \\ & + \beta^D_I \left\{ \sum_{\tilde{s},\tilde{s}\neq s} Y_{\tilde{j}\tilde{s}t} \right\} \cdot \left(1 - I^U_{jt}\right) + \beta^D_R \left\{ \sum_{\tilde{j},\tilde{j}\neq j} Y_{\tilde{j}st} \right\} \left(1 - R^U_{st}\right) \\ & + LO_{it} \cdot \left\{ \sum_{\tilde{s},\tilde{s}\neq s} Y_{\tilde{j}\tilde{s}t} \right\} \cdot \left(1 - I^U_{jt}\right)\lambda^D_I + LO_{it} \cdot \left\{ \sum_{\tilde{j},\tilde{j}\neq j} Y_{\tilde{j}st} \right\} \\ & \cdot \left(1 - R^U_{st}\right)\lambda^D_R + LO_{it}\theta + X_{ijst}\delta + \eta_t + \varepsilon_{ijst}. \end{aligned} \quad (4)$$

In this equation, the U and D subscripts on β_I, β_R, λ_I, and λ_R indicate that the parameters capture the responses to upward and downward shocks to employment. We do not have any presumption that there are asymmetric responses of employment to aggregate industry-specific or region-specific shocks, since, as noted earlier, the consequence of a more muted response to downward shocks may be a more muted response to upward shocks as well. Nonetheless, we want to allow for this possibility to ensure that we do not find spurious evidence regarding differences in employment responses associated with local ownership, and simply to understand the dynamics of establishments' employment responses. The main hypotheses discussed in the literature are concerned with whether negative shocks have less of an effect on local employment when local ownership is higher, so that the elements of λ^D_I and λ^D_R are less than zero. Some additional refinements to the analysis are discussed after we describe the core empirical results.

6. Empirical results

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, and then 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 weight the estimates by establishment size.[39] The unit of observation is always the establishment-year. After reporting estimates of the specifications described in the previous section, we report on some extensions of our analysis.

6.1. Basic findings

We first 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 (Eq. (2)). The coefficients on both the industry-specific shock and the region-specific shock 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 that aggregate across regions than to regional shocks that aggregate across industries, which perhaps is not surprising since regional economies are diversified.[40]

[38] Given that we define both the shocks and the establishment-level responses in terms of employment, we look at the relationship between these responses and contemporaneous shocks. If instead we were studying employment responses to shocks that *affect* labor demand (like input prices), we would potentially be interested in lagged adjustments, given that labor may adjust slowly (Nadiri and Rosen, 1974).

[39] We weight by establishment size to make the estimates representative of what happens to workers in different kinds of establishments.

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

Table 3
Baseline specification: Local ownership and employment change[a].

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

[a] 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 1-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 coefficient estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1%, 5%, or 10% level. Estimates are weighted by establishment employment. Entries highlighted in bold are the estimated differences between the different types of establishments that are locally owned and non-locally-owned establishments (i.e., the interactions of the shocks with LO_{it}).

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 effects of shocks. The four columns report the results of a single regression including the main effects of the two types of shocks and their interactions with dummies for the three local-ownership categories described above (Eq. (3)). Column 2a shows the main effects of the shocks on employment for the omitted category of non-locally owned establishments: shocks have a positive, statistically significant effect on employment in these establishments. For headquarters (column 2b), the differential effect of both types of shocks 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 effects of shocks on employment in headquarters establishments are 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 differential effects of the shocks on employment growth for locally-owned establishments (column 2c) are small, and not significantly different from the non-locally-owned establishments. For single-establishment firms (column 2d), the differential effect of industry shocks on employment growth is 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 for headquarters; the net effect of regional shocks on single-establishment firms is not statistically significantly different from zero.[41]

These results in Table 3, columns 2a–2d, are our baseline results; they suggest that the relationship between local ownership and employment responses to shocks 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, in multi-establishment firms). The evidence for single-establishment firms is mixed: these firms do not respond differently to industry shocks than do 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.[42] As shown in Table 4, column 1, three of the four shocks conform to the expectation that they are, on average, positively correlated with establishment-level employment growth; the only exception is that the effect of upward industry-specific shocks on employment growth is negative, though not statistically significantly different from zero.[43] Turning to the interactions 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 (column 2b). The interaction for locally-owned establishments is not different from non-locally-owned establishments for any of the four shocks (column 2c).

For employment in single-establishment firms (column 2d), the evidence for 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. But the coefficient on the downward industry shock interaction is positive (and rather large), relative to non-locally-owned establishments. This one positive coefficient is notable since downward industry shocks may have 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 of downward shocks more than of upward shocks. Moreover, the strong asymmetry with respect to industry shocks for single-establishment firms – with downward shocks exacerbated, but upward shocks muted – is consistent with industry shocks damaging the prospects of these firms over the longer run. Recall, though, that we ignore births, and if birth rates for these types of firms are relatively high, the sector as a whole need not shrink in response to industry shocks. On the other hand, 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.

[41] Comparing the coefficients on headquarters and single-establishment firms (column 2b versus column 2d), 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.

[42] Keep in mind that – regardless of the direction of the shock – positive coefficients on the interactions between shocks and local-ownership category mean that effect of the shock is amplified in those establishments, whereas negative coefficients mean that the effect of the shock is muted.

[43] It may be that our exclusion of births leads to this surprising result, if a large share of employment growth associated with positive industry shocks is in new establishments.

Table 4
Asymmetric shocks: Local ownership and employment change[a].

			Establishment category		
	Shocks (main effects) (1)	Shocks (main effects) (2a)	Headquarters (2b)	Locally-owned establishments (2c)	Single-establishment firms (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			

[a] 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 1-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 coefficient estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1%, 5%, or 10% 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. Entries highlighted in bold are the estimated differences between the different types of establishments that are locally owned and non-locally-owned establishments (i.e., the interactions of the shocks with LO_{it}).

Our baseline results are robust to several specification checks. We omitted the regions composed of a state's non-metropolitan counties because, unlike metropolitan areas, they were not created to approximate local labor markets; we defined upward and downward shocks relative to the mean shock rather than relative to zero; we included industry fixed effects and region fixed effects (in separate models); and we dropped establishments belonging to publicly-held companies since shareholders might not be located in the same region as firm headquarters and therefore might not behave like "local" owners.[44] None of these four alternative specifications changed the statistical significance or notably altered the magnitudes of our baseline estimates.[45]

6.2. More and less 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 to our expectations.

In the absence of establishment-level or firm-level information on how local or national a business's customers are, we construct a proxy using industry-level geographic concentration, measured with the Ellison and Glaeser (1997) index.[46] 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. Moreover, manufacturing industries are strongly over-represented among the most concentrated industries. When we focus on industries in the top quartile of the concentration ranking (employment-weighted), based on the Ellison–Glaeser index, 42% of employment is in manufacturing industries, compared with 12% of total employment. In contrast, in the bottom quartile, health care and social assistance, educational services, and accommodation and food services are most strongly over-represented; these represent, respectively, 34%, 25%, and 20% of employment in the bottom quartile, versus 11%, 7%, and 7% of overall employment. Retail is over-represented to a lesser extent (14% of employment in the bottom quartile, versus 11% overall).

We used this classification of industries to estimate Eq. (3) separately for the most and least geographically-concentrated industries. In particular, Tables 5 and 6 present our results for the top and bottom quartiles of industries ranked by the Ellison–Glaeser index. For the most concentrated industries, among which manufacturing is predominant, 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 5, column 1). Once again, the shock interaction for headquarters is negative for both types of shocks (column 2b). The industry shock interaction is positive for locally-owned establishments and negative for single-establishment

[44] The NETS appears to report franchises as stand-alone firms, rather than as establishments reporting to the corporation's headquarters. We infer this based on spot-checking a couple of known franchise brands by name, using variables in the NETS that capture the legal business name as well as the "doing business as" name. There is, however, no variable in the NETS that explicitly identifies franchise status, and there is no feasible way to create a franchise status indicator. Thus, we presume that for the most part we treat franchise establishments as locally managed and owned even if they operate as part of a firm headquartered elsewhere; this strikes us as the right way to model franchise behavior.

[45] The only change in significance level appeared when we defined asymmetric shocks relative to shock means rather than zero: the coefficient on the interaction between headquarters establishments and downward industry shocks moves from significant at the 10% level to the 5% level.

[46] The Ellison–Glaeser index estimates geographic concentration of industries in excess of random geographic distribution of establishments. The index measures the dissimilarity between the geographic distribution of an industry's employment and the geographic distribution of overall employment, adjusted for the size distribution of regions and for the size distribution of establishments within the industry (Ellison and Glaeser, 1997, p. 899). Higher values mean greater dissimilarity, which is synonymous with higher concentration.

Table 5
Top quartile of industries by geographic concentration: Local ownership and employment change[a].

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

[a] 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 1-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 coefficient estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1%, 5%, or 10% level. Estimates are weighted by establishment employment. We include all industries in computing the quartiles for the concentration measure, but maintain the same sample restrictions as in earlier tables for the regression analysis. Entries highlighted in bold are the estimated differences between the different types of establishments that are locally owned and non-locally-owned establishments (i.e., the interactions of the shocks with LO_{it}).

Table 6
Bottom quartile of industries by geographic concentration: Local ownership and employment change[a].

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

[a] 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 1-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 coefficient estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1%, 5%, or 10% level. Estimates are weighted by establishment employment. We include all industries in computing the quartiles for the concentration measure, but maintain the same sample restrictions as in earlier tables for the regression analysis. Entries highlighted in bold are the estimated differences between the different types of establishments that are locally owned and non-locally-owned establishments (i.e., the interactions of the shocks with LO_{it}).

firms; the region shock interaction is not statistically significant for either type of establishment (columns 2c and 2d).

For the least concentrated industries, which are dominated by services and retail, employment growth is positively correlated with region shocks but uncorrelated with industry shocks (Table 6, column 1), again consistent with expectations. 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.

6.3. Small versus large firms/chains

Our second extension is to divide locally-owned establishments (of multi-establishment firms) into those that are part of smaller firms or chains (10 or fewer establishments) or larger firms or chains (11 or more establishments), to ask, for example, whether small locally-owned firms behave like single-establishment firms, and whether establishments of larger locally-owned firms behave differently from those of non-locally owned firms. Tables 7 and 8 repeat the analysis from the baseline specification (Table 3) and the asymmetric-shock specification (Table 4) with this refinement. For the baseline specification, the coefficients on the industry shock interactions are not significantly different from zero for locally-owned establishments in either smaller or larger firms. For the region shock interaction, the coefficient is negative and statistically significant for the locally-owned establishments in smaller firms but not significant for those in larger firms.

With asymmetric shocks, none of the four interactions for locally-owned establishments in larger firms are significantly different from zero, implying that these establishments are little different from non-locally owned establishments. For locally-owned establishments of smaller firms, the downward region shock interaction is negative and significant (Table 8, column 1c). The three other interactions for these establishments are not significant. Interestingly, the response of locally-owned establishments in smaller firms to downward industry shocks is not stronger than for the omitted control group, unlike the single-establishment firms for which these shocks get exacerbated. Thus, on balance, locally-owned establishments of smaller firms may do *more* to stabilize employment than do single-establishment firms.

7. 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 effects

Table 7
Small versus large firms: Local ownership and employment change[a].

		Establishment category			
	Shocks (main effects)	Headquarters	Locally-owned establishments, smaller firms	Locally-owned establishments, larger firms	Single-establishment firms
	(1a)	(1b)	(1c)	(1d)	(1e)
		Interacted with shocks			
Industry-specific shock	0.481	**−0.514**	**−0.161**	**0.102**	**0.158**
	(0.099)***	**(0.103)*****	**(0.117)**	**(0.127)**	**(0.228)**
Region-specific shock	0.345	**−0.479**	**−0.225**	**0.106**	**−0.283**
	(0.059)***	**(0.077)*****	**(0.081)*****	**(0.191)**	**(0.093)*****
		Main effects			
		0.118	0.036	0.029	0.043
		(0.009)***	(0.017)**	(0.014)**	(0.009)***
N		183,035,220			

[a] Columns 1a–1e are the output from a single regression. The dependent variable is the employment growth rate, measured as the 1-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 coefficient estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1%, 5%, or 10% level. Estimates are weighted by establishment employment. "Smaller" firms have 10 or fewer establishments; "larger" firms have 11 or more. Entries highlighted in bold are the estimated differences between the different types of establishments that are locally owned and non-locally-owned establishments (i.e., the interactions of the shocks with LO_{it}).

of shocks on employment growth differ 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, downward region shocks are muted, although less so than for headquarters establishments, while in response to downward industry shocks single-establishment firms contract *more* than the typical non-locally owned establishment. When we break out locally-owned establishments of multi-establishment firms into those belonging to smaller and larger firms, the establishments of smaller firms exhibit the same insulation from downward regional shocks as do single-establishment firms, but neither amplify nor mute downward industry shocks. Since one goal of policies encouraging local ownership is presumably to prevent employment losses in the face of negative shocks, these differences in results are important from a policy perspective, as they mean that local ownership, *per se*, does not cushion localities from negative industry shocks, and locally-owned, single-establishment firms may make things worse.

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 in some cases, and locally-owned establishments of larger multi-establishment firms are no different from non-locally-owned establishments of such firms. Moreover, the externality argument might be most compelling with respect to downward shocks. We do find evidence consistent with muting of downward regional shocks for locally-owned single-establishment firms and establishments of smaller firms. 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.

This pattern of results is difficult to reconcile with the externality argument. On one hand, the externality argument might be stronger for smaller firms than larger firms, if their owners are more likely to have personal relationships with local employees or for some related reason are less willing to lay off local workers in the face of a negative shock. On the other hand, the results do not carry over to single-establishment firms, where we might expect such considerations to be strongest. One possibility is that the externality argument weakens for the smallest firms (i.e., single-establishment firms) because their employment decisions have a smaller impact on the local economy and are less likely to affect local demand for their own products. But then this raises the question of why locally-owned establishments of larger firms do not insulate local economies from economic shocks. Perhaps there are offsetting influences, with smaller locally-owned firms taking greater account of their external effects, but single-establishment firms being too weak to withstand the adverse impacts of downward industry shocks.

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.[47] This fixed-cost explanation is consistent with the similar employment response to shocks in non-locally owned establishments and locally-owned establishments of large firms. It is also consistent with employment in locally-owned establishments of small firms and 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 (although the evidence is not fully consistent for single-establishment firms). From the perspective of stable local employment, locally-owned establishments of smaller multi-establishment firms appear to represent a middle ground between the stable employment of headquarters, on the one hand, and the shock-responsive employment of non-locally-owned establishments of multi-establishment firms and locally-owned establishments of large firms, on the other.

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 and in locally-owned establishments of smaller 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,

[47] For related reasons, downward shocks may be particularly muted at headquarters because these are unlikely to close even if other establishments are closing.

Table 8
Asymmetric shocks for small versus large firms: Local ownership and employment change[a].

		Establishment category			
	Shocks (main effects)	Headquarters	Locally-owned establishments, smaller firms	Locally-owned establishments, larger firms	Single-establishment firms
	(1a)	(1b)	(1c)	(1d)	(1e)
		Interacted with shocks			
Industry-specific shock	0.051	**−0.524**	**−0.283**	**−0.295**	**−0.242**
(Upward)	(0.110)	**(0.217)****	**(0.269)**	**(0.216)**	**(0.112)****
Industry-specific shock	0.901	**-0.545**	**0.069**	**0.600**	**0.617**
(Downward)	(0.138)***	**(0.301)***	**(0.430)**	**(0.386)**	**(0.217)*****
Region-specific shock	0.312	**−0.297**	**−0.027**	**0.061**	**−0.169**
(Upward)	(0.063)***	**(0.094)*****	**(0.073)**	**(0.120)**	**(0.074)****
Region-specific shock	0.307	**−0.716**	**−0.456**	**0.205**	**−0.304**
(Downward)	(0.100)***	**(0.149)*****	**(0.149)*****	**(0.325)**	**(0.118)*****
		Main effects			
		0.111	0.034	0.041	0.054
		(0.011)***	(0.022)	(0.015)***	(0.007)***
N		183,035,220			

[a] Columns 1a–1e are the output from a single regression. The dependent variable is the employment growth rate, measured as the 1-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 coefficient estimates, adjusted with multi-way clustering by industry and region. ***, ** and * indicate significance at the 1%, 5%, or 10% 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. "Smaller" firms have 10 or fewer establishments; "larger" firms have 11 or more. Entries highlighted in bold are the estimated differences between the different types of establishments that are locally owned and non-locally-owned establishments (i.e., the interactions of the shocks with LO_{it}).

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. The effectiveness of local ownership policies depends on which type of locally-owned businesses the policies are designed to support. Ironically, perhaps, favoring headquarters of multi-establishment firms does the most to promote employment stability and to insulate regions from downward shocks defined both by industry and region, even though the primary intent of local ownership policies appears to be to help locally-owned small firms.

Of course, our results must be balanced against the potential costs of alternative policies. The costs to localities of attracting or retaining headquarters or other types of locally-owned businesses may 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.[48] In addition, as noted earlier, we do not address all the potential benefits of locally-owned firms. Nonetheless, from the narrow perspective of insulating a region from economic shocks, if anything it appears that policymakers should be most interested in attracting and retaining corporate headquarters.

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[48] 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.

Appendix A

A.1. The National Establishment Time Series

Our empirical analysis relies on data from the National Establishment Time Series (NETS) database, which is intended to cover all business establishments in the United States between 1989 and 2006.[49] The NETS database does not contain a rich set of information about each establishment, but it does include the business name, a unique D&B establishment identifier (the DUNS number), the establishment location, both SIC and NAICS industrial codes in each year, the identifier of the firm's headquarters, and employment (as well as sales, which we do not use because it is usually imputed) in each year.[50]

The unit of observation in the NETS is a business establishment, which is a business or industrial unit at a single physical location that produces or distributes goods or provides services – for example, a single store or factory. Using the headquarters' DUNS number, we are able to assess whether an establishment is a stand-alone firm or a branch of a multi-establishment firm. The data in the NETS do not come from a single survey. Rather, D&B collects the underlying data through a massive data collection effort covering many sources, including over 100 million telephone calls to businesses each year, as well as obtaining information from legal and court filings, newspapers and electronic news services, public utilities, all US secretaries of state, government registries

[49] We use data only back to 1992. The data prior to 1992 are less reliable because only beginning in 1992 was D&B able to purchase Yellow Page information on business units. For more information about the NETS and comparisons to other data sources, see http://www.youreconomy.org/nets/NETSDatabaseDescription.pdf (viewed December 17, 2008).

[50] The exact meaning of employment in the NETS data is somewhat different from what is used by the Bureau of Labor Statistics (BLS). The BLS usually defines a firm's (or establishment's) employment as the number of employees on payroll on a particular date. In contrast, D&B continuously collects employment information throughout the year. The interviewer/online questionnaire asks a broad question: "How many persons are employed at your establishment?" No particular date is specified in the question and it does not distinguish between full-time and part-time employees. D&B's employment number also includes the owner of the business, whereas other sources capture employees only. The annual NETS Database is constructed using January snapshots of the D&B data – i.e., the data as of January of each year.

and licensing data, payment and collections information, company filings and news reports, and the US Postal Service.

The NETS is created by longitudinally linking the underlying D&B data. This requires linking the D&B cross-sections into a longitudinal file that tracks every establishment from its birth, through any physical moves it may make, capturing any changes of ownership, and recording the establishment's death if it occurs. This is a multistage process, the most important of which include merging the data files, imputing data when data are not reported, eliminating duplicate records, identifying establishment relocations, and merging records on establishments for which the DUNS number changes yet which appears to cover the same establishment (which happens occasionally).

We have done extensive analysis of the quality of the NETS data along a number of dimensions, including the measurement of employment and linkages between establishments of the same firm, both of which are of obvious importance in this paper. Much of this analysis was done for an extract of the NETS for California only.[51]

Overall employment levels captured in the NETS are higher than in either the Current Population Survey or Current Employment Statistics (CES, the "payroll survey"), apparently for two reasons. First, the NETS counts each job in each business establishment, including, for example, counting as two jobs an individual who owns two proprietorships. And second, the NETS has better coverage of small-business owners (based on comparisons with the Statistics of Business (SOB) data). To look at a more disaggregated level, we have done county-by-industry comparisons for California using the NETS, the Quarterly Census of Employment and Wages (QCEW), and the CES. The QCEW is based on ES-202 data, which excludes the self-employed, proprietors, domestic workers, unpaid family members, and some other groups. The CES covers all nonfarm payrolls. Unlike the NETS, these datasets only provide aggregate statistics at various geographic, industry, or establishment size levels, and not at the establishment level. Comparisons of employment measurements at the county-by-industry level yield correlations of 0.99 with the CES and 0.95 with the QCEW. We have also assessed the quality of employment measurements in the NETS by establishment size and industry, comparing the NETS and SOB data. For industry-size cells, the correlation is 0.81. The discrepancies arise in the small size cells, presumably reflecting the better coverage of small establishments in the NETS than in the SOB data.

With regard to employment changes, the correlations between the NETS and other data sources are lower for two reasons. First, employment counts in the NETS are often rounded, so employment change is "sticky." Second, a fairly high share of employment observations in the NETS are imputed – for the California part of the file we examined in detail as many as one-quarter or one-third in some years.[52] The imputation of employment data likely diminishes year-to-year variation in employment. For 1-year employment changes by county and industry, the NETS-QCEW correlation is only 0.53. However, at a lower frequency the correlation is much higher; for example, 0.86 for changes over 3-year intervals. For the specifications we estimate in this paper, this measurement error in employment change is unlikely to be problematic. Errors at the establishment level simply constitute measurement error in the dependent variable, and when we estimate shocks by aggregating across many observations, these errors should by and large average out to zero.

For this study, the accuracy of linkages of establishments to their parent firms is critical. We have assessed the linkages of establishments to their parent firms, for a few different types of industries for which the quality of information may vary. The problem is finding another source of data on companies that includes their establishments along with opening dates and locations. As it turned out, we had administrative information on all Wal-Mart stores and their opening dates from another source.[53] We found similar information for Intel, in manufacturing, and for the Cheesecake Factory, in retail. Overall, the tracking of firms' establishments works quite well, although there are sometimes establishments from the alternative data sources that do not appear in the NETS, or vice versa. These "matching" errors appear to arise largely in the most recent years of the data set because the NETS sometimes detects new establishments with a delay.

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[51] This discussion briefly summarizes results reported in detail in Neumark et al. (2007) and Kolko and Neumark (2007).

[52] Imputation is a feature of establishments' earliest appearances in the database. Once actual employment data are provided for an establishment, they are very likely to be provided in all subsequent years.

[53] We obtained these data under a special agreement with Wal-Mart to study the relationship between Wal-Mart and retail employment (see Neumark et al., 2008).

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