Economic Development Quarterly
2020, Vol. 34(2) 140–153

DOI: 10.1177/0891242420917756
journals.sagepub.com/home/edq
SAGE

Incentives and Firm Migration: An Interstate Comparison Approach

Yuxuan Pan[1], Tessa Conroy[1], Alexandra Tsvetkova[2], and Matthew Kures[1]

Abstract

The authors model how state business incentives influence interstate relocation patterns of manufacturers using a panel (2000-2011) of 32 states. The National Establishment Time Series database and the Panel Database on Incentives and Taxes are used to study relocation by manufacturing establishments based on differences between the origin and destination states. The authors find that traditional factors associated with business climate, such as taxation and subsidies, statistically influence manufacturing interstate relocation. Further analysis shows that policy changes (e.g., increasing incentives and reducing taxes) to induce manufacturers to relocate may need to be infeasibly large or used in combination to evoke an economically meaningful increase in relocations.

Keywords

firm relocation, business climate, manufacturing, incentives

The United States has a long and rich tradition of individual states competing for economic activity. In 1791, the state of New Jersey offered tax incentives to industrialist Alexander Hamilton to influence the location of a manufacturing plant. By 1844, the state of Pennsylvania had invested over $100 million and placed promoters of the state on the boards of directors of more than 150 corporations with the clear intent of stimulating business investments within the state. But the current "war between the states" can be traced to the Mississippi Balance Agricultural with Industry Act of 1933. Struggling with the lingering effects of the Great Depression, the state of Mississippi actively encouraged manufacturers in the northern states to consider relocating to Mississippi. The central theme of the promotion was low taxes, limited regulations, and inexpensive land, as well as cheap and abundant labor.

Today, one of the most common ways for states to compete for economic activity is to encourage firms to relocate from one state to another by marketing a stronger or more "positive business climate" (Deller & Goetz, 2009; Stallmann & Deller, 2011).[1] McCarthy (2015) defined this kind of policy as a supply-side approach to business climate, where policies are built on neoclassical firm location theory and focus on the costs of production. These policies take two forms: (a) reducing both tax burdens and regulations and (b) offering focused incentive packages targeting individual businesses (Eisinger, 1988). We limit our attention in this study to these types of policies only and do not consider other approaches, such as competing on talent.

Some examples of the latter that focused on manufacturers include such efforts as Honeywell's move to North Carolina or Mitsubishi to Tennessee. Recruiting has arguably reached new bounds as places compete for Amazon and with Wisconsin offering a $4.5 billion incentive package to recruit Foxconn. While the positive outcomes of such incentives have been readily challenged in the academic literature (e.g., Gabe & Kraybill, 1998, 2002), they remain popular among policy makers (Feser, 2014; Hanley & Douglass, 2014; Stokan, 2013). Indeed, announcements by Amazon to withdraw from New York and Foxconn reevaluating its strategy in Wisconsin has refocused attention on the effectiveness of these incentive packages in the public discussion.

While there are many studies analyzing new firm or new branch location, analyses of firm *relocation* are less common. This distinction is important in that factors driving the location decision of a new start-up or of a larger firm looking for a site for a new facility are likely to be very different from the *relocation* drivers of an established business (Brouwer et al., 2004; Hong, 2014; Kronenberg, 2013; Manjón-Antolín

[1]University of Wisconsin–Madison, Madison, WI, USA
[2]OECD Trento Centre for Local Development, Trento, Italy

Corresponding Author:
Tessa Conroy, Department of Agricultural and Applied Economics, Center for Community Economic Development, University of Wisconsin–Madison, 521 Taylor Hall, 427 Lorch Street, Madison, WI 53706, USA.
Email: tessa.conroy@wisc.edu

& Arauzo-Carod, 2011; Weterings & Knoben, 2013). An existing firm, particularly in manufactuirng, is likely to have high fixed costs anchoring it to its current location, given prior investments in the facility or embeddedness in the local networks of suppliers. Such considerations are normally not a part of calculations in a *location* decision. An analysis of the manufacturing *relocation* decisions, however, offers a stronger test of the ability of specific types of incentives to induce desired changes in economic behavior of firms because of the higher costs of relocation.

The research on the effects of taxes and business incentives on business behavior has been mostly hampered by the lack of sufficiently detailed and comparable data with broad geographical coverage. The Panel Database on Incentives and Taxes (PDIT) by the W. E. Upjohn Institute for Employment Research, which contains measures of taxation and business incentives of several types for a representative firm in each of 45 industries and 32^2 U.S. states, allows researchers to carry out detailed analyses. We combine this data source with the National Establishment Time Series (NETS) database to observe the movement of establishments across state lines and to measure the differences in ED policies across the "sending" and "receiving" states.[3] The detail of the PDIT data allows us to empirically assess variation in the effects of a range of incentives and taxes on interstate relocation patterns.

The main contribution of this study to the literature is to explore in greater detail, for the first time, the effects of several types of taxes and business incentives on the interstate relocation patterns in the manufacturing industry. Given that state incentives, particularly to manufacturers, tend to be especially large (as evidenced by the PDIT), a better understanding of the direction and economic magnitude of the effects on business behavior is of primary importance to policy makers. Our analysis allows drawing general conclusions about the effectiveness of the past economic growth and development policies and may serve as a basis for the design of future interventions.

In the next section, an overview of the literature, with an eye toward different theoretical frameworks, provides a synthesis of previous research on relocation determinants. The theoretical framework and the empirical model follow. The data for the analysis are then detailed, followed by the analysis results, policy implications, and conclusions.

Literature Review

There is a vast literature on firm location decisions, both theoretical and empirical. The study of business *relocations*, however, is less common possibly due to the limited availability of data on business moves. Thus, many of the early studies of relocation tend to focus on small geographical areas where tracking a modest number of local businesses was feasible (e.g., Schmitt et al., 1987). Data sets of the United States that allow this type of tracking over a large geographical area and time frame, such as the NETS, have only recently become available.

To relocate, a firm needs to believe that it is better to operate in a new location. In other words, the previous location was unfavorable for any of a range of reasons (the push factors) and the new location is expected to be superior to the previous one (the pull factors). The theoretical literature on factors driving relocations usually considers the characteristics of a place that determine cost and revenue structure of the firm (the neoclassical perspective), internal firm characteristics and processes (the behavioral perspective), and the social and cultural environments (the institutional perspective). In reality, each perspective is likely to capture, to a varying degree, a subset of factors that work together and differ across places, industries, and types of firms. The set of relocation drivers are also likely to be unique in each relocation instance.

The neoclassical approach is heavily based on profit maximization and generally assumes away the costs associated with gathering and processing information, the market power that the firm may have in negotiations, and other considerations that are relevant to relocation decisions (Deller, 2009; Pellenbarg et al., 2002; Shaffer et al., 2004). Empirically, studies of neoclassical relocation determinants focus on labor and transportation costs, market size, agglomeration economies and other, mostly regional, characteristics. For example, this literature shows that labor force availability (Erickson & Wasylenko, 1980), access to transportation networks (Ozmen-Ertekin et al., 2007), and agglomerations make regions attractive to firms (Figueiredo et al., 2002).

Within the behavioral theoretical approach (Simon, 1957), a firm is assumed to have bounded rationality, to possess limited information, and to base a relocation decision on both external and (perhaps to a greater degree) internal factors, particularly preferences around risk. This theory focuses on the firm itself—its characteristics, inputs, and processes where profit-maximizing behavior is not the ultimate goal (Deller, 2009; Pellenbarg et al., 2002; Shaffer et al., 2004). Both Halstead and Deller (1997) and Conroy and Deller (2014) have argued that for many firms, particularly smaller firms, which dominate the economic landscape, the preferences for the personal residence of the business owner can outweigh the attractiveness of the expected revenue increase associated with long-distance relocation. For many of these firms, the business owner started the business within the community they reside and any relocation of the business tends to be within a close distance of the owner's residence. Furthermore, these businesses may be focused on reasonable rates of return and stability rather than pure growth and profit maximization.

The empirical literature confirms that risk and uncertainty decrease the likelihood of relocation (Pennings & Sleuwaegen, 2000), while firms with high information levels and resources

may be expected to have a higher likelihood of relocating (Pred, 1967). The behavioral approach is suitable for conceptualizing why smaller firms, which lack the capacity to gather and process sufficient quantities of information about all potential relocation sites, tend to relocate a short distance away from the original location.

The institutional perspective on business relocation draws attention to the role played by social and cultural institutions and value systems. For example, a firm may need to negotiate with a potential destination's labor union, suppliers, and local government or may prioritize knowledge-intensive networks in their relocation processes (Hayter, 1997). Like the neoclassical theory, this approach is most relevant to large firms, which have the size and resources to negotiate with local government to secure a more attractive relocation package (Conroy et al., 2015, 2016, 2017). When larger firms move, such as those previously mentioned—Amazon, Foxconn, Mitsubishi, and Honeywell—they can take advantage of asymmetric information to leverage incentives that favor the company. The concern is that a large firm can use that leverage to extract rents by negotiating overly generous incentive packages, which may hurt the economy of its new host region.

Importantly, the unique mix of drivers relevant for actual decisions to relocate differs across industries. The location factors that favor financial institutions differ from that of manufacturers. Even within manufacturing, the heterogeneity of processes and firm types makes drawing generalizable inferences about the underlying drivers of relocation decisions difficult. The determinants are likely to differ by company size (multiplant, multinational corporations to small independent firms), maturity of the industry (new to those farther along their product life cycle), and other characteristics. These differences matter when regions pursue business attraction policies. Generally, U.S. states tend to prioritize growth industries or those that invest in innovation through research and development (R&D) expenditures. Still the sentiment of Rubin (1988), where states tend to "shoot anything that flies and claim anything that falls," is still relevant today. The short-term political pressures to score "wins" can push strategical industrial targeting to the side. In the end, any study that seeks to better understand the drivers of relocation decisions and gain insights into more effective policies must combine all three theoretical perspectives on relocations, and to consider the diversity of businesses and incentives across the range of industry types.

Theoretical and Empirical Model

Following Conroy et al. (2015, 2016, 2017), we base our empirical analysis on all three theoretical approaches. We model the relocation of manufacturing establishments across state lines using annual 2000 to 2011 data from the NETS data set as a function of regional characteristics of both the origin and destination states.[4] This allows us to capture both "pull" and "push" factors. To account for the heterogeneity of the manufacturing sector in the United States, we first study all manufacturers together and then group them by low, medium, and high levels of innovation based on the industry levels of R&D expenditures.

This study, however, makes several distinct contributions. First and foremost, with the addition of the PDIT data it is possible to consider incentives far more precisely than in the previous work. Due to the high industry detail of the PDIT data, we are able to account for the tax and incentive structures faced by a representative firm in its respective sector/subsector. The PDIT also allows us to create an index for incentives to understand the relative generosity of each state across several policies. The PDIT does come with some limitations in that it is only available for 32 states, thus limiting our sample of state-to-state relocations to those in the PDIT data. Another distinct feature of these data is the addition of the zero-relocation pairs. We consider this particularly important as these represent economic circumstances where the differences in the business environment generally, and the incentives specifically, do not correspond to any relocations. For our purposes of understanding the impact of incentives on an average firm behavior in an industry, we find the instance of no relocation as important as the (positive) flows of relocation.

Theoretical Model

Our modeling approach is based on a population migration model as applied by Grassmueck et al. (2008) and adapted to firm migration by Conroy et al. (2016). A profit maximizing manufacturer i considers their expected profit $E(\pi_i^k)$ at their current location k based on production and a number of features of that location including taxes as well as public goods and services. The firm compares their profit in their current location with the expected profit $E(\pi_i^{k^D})$in a potential destination state k^D. Assuming the market for their output is unaffected by their location choice, the manufacturer will choose to relocate from state k to state k^D if:

$$M^{k,k^D} = E\left(\pi_i^{k^D}\right) - E\left(\pi_i^{k}\right) = \alpha^*\left(d_i^{k^D} - d_i^{k}\right) - \beta^*\left(w_i^{k^D} - w_i^{k}\right) + \gamma^*\left(G_i^{k^D} - G_i^{k}\right) + \varepsilon > 0$$

where d_i represents a difference between the amount of incentives and taxes, w_i are inputs, and G_i are public goods and services. Thus, the decision to relocate is determined by the difference in expected profits between two states, which is itself a function of the differences in several key variables including expected taxes and incentives.

Empirical Model

Empirically, we compare the origin and destination states to investigate how regional characteristics of both states affect relocation behavior of U.S. manufacturers. An advantage of such an approach is the ability to draw inferences based on the differential, which is a more precise measure of relocation incentives. For example, a firm in a very high-tax state has a greater incentive to move to a low-tax state than does a firm considering a move to the low-tax state from an average-tax state.

We estimate the following equation using annual panel data:

$$M_{ij,t} = \sum_{l=1}^{L} \theta_l \Delta x_{l,ij,t} + N_{ij} + T_t + D_j + \varepsilon_{ij,t}$$

where $M_{ij,t}$ is the number of manufacturers that relocate from state i to state j in year t, $\Delta x_{l,ij,t}$ is the *difference* between state i and state j (origin state minus destination state) across a set of l variables in year t, N_{ij} is the dummy variable if state i and state j are neighbors, T is a time fixed effect and D is a destination state fixed effect. We use a negative binomial estimator, appropriate in our case of a zero-inflated dependent variable and overdispersion. The addition of destination fixed effects is another departure from past work that helps to clearly distill the effects of the incentives and reduce the concern for endogeneity. While endogeneity may still persist, the combination of differencing the explanatory variables, including a number of controls, and using fixed effects reduce such a concern.

Data and Variables

Our empirical analysis relies on state-level data for the 2000 to 2011 period. We limit our attention to the 32 states that are present in the PDIT. To capture potential change in the effects after the Great Recession, we also estimate and model separately for the 2000 to 2007 and 2007 to 2011 periods. All variables are used as differences between the origin and destination state. This approach implies that the flow of firms between any two states is directional, meaning the estimation data set includes each state pair twice (e.g., state pair WA–OR appears as WA–OR with the count of firms moving from Washington to Oregon and OR–WA with the count of firms moving from Oregon to Washington). Each observation thus reflects a flow of firms exhibiting different behavior in the context of comparing the relative desirability of their home and destination states. Descriptive statistics for the independent variables are provided in Table 1.

The incentives and tax data are from the W. E. Upjohn Institute for Employment Research. Expenditure data are from the Annual Survey of State and Local Governments conducted by the U.S. Census Bureau, and the socioeconomic data are drawn primarily from the Census. Note that the differences approach to modeling firm relocation implies the mean of zero across independent variables.

The Focal Incentive Variables

Our set of explanatory variables is derived from the PDIT compiled by the W. E. Upjohn Institute for Employment research (Bartik, 2017), which includes annual data on incentives and taxes for 32 states and the District of Columbia detailed by industry (45 industries including 19 manufacturing industries, which are the focus of our analysis). The measures of taxes and incentives are not the actual amounts received by the existing establishments. Instead, the database contains estimated (model generated) values of what a representative firm/industry is expected to face expressed as a share of value added generated by this industry.

The model first constructs a balance sheet for a representative company using the 2011 U.S. Bureau of Economic Analysis industry data, which is supplemented with the IRS company income data and with some other sources. The tax data come from the Commerce Clearing House's State Tax Guides (1990 to 2013), the Tax Foundation, and the Lincoln Institute of Land Policy. The incentives data are retrieved from summaries by Good Jobs First (2014) and the state incentives database by the Council for Community and Economic Research (C2ER). The taxes included in the database are property taxes and state corporate income taxes. The specific incentives that we use are (a) job-creation tax credits, (b) property tax abatements, (c) customized job-training grants, and (d) R&D tax credits.

It must be noted that the specific companies included in the flow counts used as the dependent variable in our analysis may or may not have received the incentives. Our explanatory variables based on the PDIT reflect "a standard deal," both in terms of taxes and incentives, available to a new establishment in a state. While it is reasonable to expect the tax level to be more or less equally applicable to all businesses, it is also reasonable to expect that not all firms benefited from available support programs. Although it can be perceived as a limitation of our study, we believe the analysis still offers valuable insights into the expected effects of offering incentives and changing taxes on relocation decisions. Looking at what is offered (as opposed to what is actually used) is a measure that is, in a sense, closer to reality, as it better reflects what state and local governments can actually do in their attempts to induce relocations.

To derive the actual values included in the model, we first aggregate the data on each type of incentives and taxes into values for total manufacturing, and three levels of industry types based on perceived levels of innovation: high R&D manufacturing, medium R&D manufacturing, and low R&D manufacturing. The disaggregation allows us to assess differences in the responsiveness to a range of factors, most notably incentives and taxes, in the relocation decisions of

Table 1. Summary Statistics.

Variables	*M*	*SD*	Min	Max
Property tax	0.00	0.0148	−0.0507	0.0507
State corporate income tax	0.00	0.0069	−0.0207	0.0207
Job creation tax credit	0.00	0.0068	−0.0191	0.0191
Customized job-training grants	0.00	0.0016	−0.0052	0.0052
Research and development (R&D) tax credit	0.00	0.0029	−0.0087	0.0087
Property tax abatements	0.00	0.0101	−0.0285	0.0285
Share of population 25+ years old with at least a bachelor's degree	0.00	6.7598	−20.0000	20.0000
Compensation per job in manufacturing	0.00	11.8763	−38.4463	38.4463
Individual poverty rate	0.00	4.0913	−13.1000	13.1000
Spend on higher education per $1,000 of personal income	0.00	7.7715	−25.1813	25.1813
Share of state employment in manufacturing	0.00	4.4717	−14.8651	14.8651
State average electricity rate	0.00	9.7075	−35.6300	35.6300
Individual income tax per $1,000 of personal income	0.00	16.5210	−49.0600	49.0600
Welfare programs per $1,000 of personal income	0.00	11.9288	−45.3569	45.3569
Spend on K-12 education per $1,000 of personal income	0.00	9.5707	−43.6411	43.6411
Corrections per $1,000 of personal income	0.00	2.0026	−7.2702	7.2702
Highways/roads per $1,000 of personal income	0.00	4.5192	−17.8605	17.8605
Union membership rate	0.00	7.9309	−23.8000	23.8000
Unemployment rate	0.00	1.7090	−10.2000	10.2000
Neighbors	0.11	0.3140	0	1
Observations			11,904	

existing establishments. We expect such differences to exist for a number of reasons. First, as suggested by the industry life-cycle theory (Rink & Swan, 1979), manufacturing industries differ in their innovativeness depending on their maturity. Younger industries are characterized by intensive experimentation and knowledge creation, which determines their location preferences—closer to the hubs of knowledge generation. Establishments in younger industries are also likely to respond to a specific set of incentives, such as R&D tax credits and potentially customized job-training grants. Manufacturers in the more established manufacturing industries, in contrast, tend to be less innovative and would seek low-cost locations (i.e., in low-tax states).

Next, states often choose a subset of industries, which are considered particularly important for economic growth of the territory. These industries differ across states but the selection of the "targets" usually favors those with greater levels of R&D. If the levels of incentives and taxation differ across industries, which is often the case, disaggregation helps mitigate the aggregation bias that is likely to emerge. We follow Conroy et al. (2016) in grouping manufacturing industries by their knowledge intensity to reflect the heterogeneity of manufacturers in their relocation decisions.

Since values in the PDIT are the share of value added and the database provides value added used in calculation, we are able to calculate total value added for each sector and subsector used in this analysis and the dollar value of incentives and taxes for corresponding sectors and subsectors. Dividing the latter by the former gives us incentives and taxes at the level of aggregation used in this analysis. The details of how we group manufacturing industries into low-, medium-, and high-innovation ones is provided in Table 2. In the final step, we calculate differences for each state pair for every type of incentives and taxes.

A Preview of Incentives and Relocations: An Incentives Index

Before delving into an investigation of the multifaceted state incentives and possible relocation responses to them, we created an index that could be useful for gaining a better understanding of the relative attractiveness of a state and its in- and out-migration of manufacturing firms. The index normalizes each state's incentives for each year with the average across states for the corresponding year. For taxes, we take the inverse so that the greater values indicate a lower tax burden, which is more favorable to businesses, similar to grants, abatements, and credits. We then sum across all six incentives and taxes (property taxes, state corporate income taxes, job-creation tax credits, property tax abatements, customized job-training grants, and R&D tax credits) to create an index for each state year. Finally, we calculate the average incentives index across the time period of the study.

The incentives index compared against the in-migration and out-migration values in Table 3 gives basic insight into how incentives correspond to firm migration. In general, the incentives index does have positive relationship with in-migration (Figure A1, which is featured online as a supplement to this article), as would be expected, though not especially strong. As an example, based on our index New

Table 2. Manufacturing Industries by R&D Group.

High R&D industries	Medium R&D industries	Low R&D industries
Chemical manufacturing (9)	Printing and related support activities (7)	Food, beverage, and tobacco manufacturing (2)
Computer and electronic product manufacturing (15)	Machinery manufacturing (14)	Textile mills and textile product mills (3)
Electrical equipment, appliance, and component manufacturing (16)	Furniture and related product manufacturing (19)	Apparel, leather and allied product manufacturing (4)
Motor vehicles, bodies and trailers and parts (17)	Miscellaneous manufacturing (20)	Wood product manufacturing (5)
Other transportation equipment (18)		Paper manufacturing (6)
		Petroleum and coal product manufacturing (8)
		Plastics and rubber products manufacturing (10)
		Nonmetallic mineral product manufacturing (11)
		Primary metal manufacturing (12)
		Fabricated product manufacturing (13)

Note. R&D = research and development; PDIT = Panel Database on Incentives and Taxes. Industry Number from PDIT in parentheses.

Mexico ranks first as the most desirable state for incentives and ranks 13th for in-migration, placing just short of the top one third of the 32 states that we consider. Alternatively, Nevada is the least desirable state based on incentives and ranks. Nevada, with the least generous incentives, ranks 30th for in-migration. While these particular examples are just two cases, they do seem to illustrate that, in general, a high-ranking state is a more desirable destination and a low-ranking state is a less desirable destination.

Interestingly, incentives also have a positive relationship with out-migration (Figure A2, which is featured online as a supplement to this article). Although weaker than the case of in-migration, it appears that states with a high-ranking index also, perhaps unexpectedly, have high out-migration. Returning to the two examples, we might expect New Mexico to rank quite low in terms of out-migration, as establishments would want to stay in the local business environment, but New Mexico ranks 10th for out-migration. Nevada, however, is more consistent with expectations in that it ranks last for incentives and has high out-migration, ranking third.

Figure A1 (featured online as a supplement to this article) provides initial evidence that incentives do have some effect in luring firms in that high-incentive states do generally have higher in-migration. However, Figure A2 (featured online as a supplement to this article), suggests that high-incentive states tend to also have high out-migration. Taken together, it appears that incentives are associated with more firm movement generally, both in and out of the state, perhaps resulting in only small gains for a high-incentive state.

The Dependent Variable

The dependent variable, the number of manufacturing establishments relocating from one state to another in a given year for each state pair, is aggregated from the establishment-level NETS database. This data source has been widely used for the analysis of various business processes (Deller & Conroy, 2017; Tsvetkova et al., 2014; Tsvetkova et al., 2019) and is described in greater detail in previous studies (e.g., Barnatchez et al., 2017; Neumark et al., 2007). In terms of the NETS data quality, several studies compared this data set with the official data offered by the governmental agencies. The general conclusion of these analyses is that despite certain limitations, the NETS is appropriate for the study of economic phenomena, especially when used in combination with other data sources (Barnatchez et al., 2017).

The most widely cited limitations of the data set include the heavily imputed employment for smaller companies, adopting a broad view of employment (i.e., counting owners as employees), continuous data collection throughout the year (which can affect employment counts for businesses with a seasonal nature of operations as well as timing of the data), and multiyear gaps between actual business establishment and the establishment date reported by the NETS (Barnatchez et al., 2017; Echeverri-Carroll & Feldman, 2019).

On the other hand, the literature seems to agree that the geographical location of establishments provided by the NETS is generally consistent with other sources. This is an important conclusion for our study, as it does not rely on the employment data but instead looks at the changes in business location. The data also have been found to be particularly well suited for the study of interstate relocations, although this evaluation is based on the analysis of the California subset of the NETS (Neumark et al., 2007).

For an introduction to the dependent variable, we first sum in-migration or the arriving establishments and out-migration or the departing establishments for each state and list their rank in Table 3 (the table also contains the incentive index, which is described in the next subsection). Though we eventually focus on relocation as a flow of firms between any two states to capture *relative* attractiveness of state policies, looking at in-migration and out-migration in sum can demonstrate some underlying trends. First, in sum there are 18,967 relocations in our truncated sample. For comparison, there were 330,000 manufacturing establishments in the United States in 2006 (the midpoint of our study) according to the U.S. Census County Business Patterns. Over the

Table 3. State In- and Out-Migration and Incentives Index.[4]

State	Out-migration	Rank	In-migration	Rank	Out-migration per million	Rank	In-migration per million	Rank	Incentives index	Rank
Alabama	209	29	284	28	44	30	59	22	3.02	27
Arizona	387	19	733	10	60	26	113	3	7.78	6
California	2315	1	1364	2	62	22	36	31	6.82	9
Colorado	486	14	462	17	95	4	90	9	2.69	28
Connecticut	424	16	368	23	118	2	103	5	3.65	21
Florida	1388	3	1799	1	73	9	94	8	3.32	24
Georgia	649	9	813	8	66	17	83	11	4.34	16
Iowa	209	28	176	29	68	14	57	24	8.91	3
Illinois	994	5	777	9	77	7	60	19	4.08	18
Indiana	417	17	459	19	64	18	70	16	8.29	4
Kentucky	265	27	326	25	61	24	75	14	1.83	30
Louisiana	198	30	120	31	43	31	26	32	9.19	2
Massachusetts	499	12	396	22	75	8	60	21	5.41	13
Maryland	400	18	316	26	69	13	54	27	4.56	15
Michigan	625	10	570	12	63	21	58	23	8.24	5
Minnesota	372	21	305	27	70	11	57	25	3.19	25
Missouri	291	24	327	24	48	29	54	26	7.30	7
North Carolina	613	11	988	6	63	20	102	6	4.16	17
Nebraska	104	32	92	32	57	27	50	29	6.46	10
New Jersey	1188	4	1058	4	135	1	120	2	7.05	8
New Mexico	148	31	159	30	71	10	76	13	12.25	1
Nevada	279	26	444	20	103	3	164	1	1.09	32
New York	1805	2	989	5	93	5	51	28	5.91	12
Ohio	736	8	693	11	64	19	60	20	3.51	22
Oregon	352	22	416	21	91	6	107	4	3.38	23
Pennsylvania	847	6	895	7	66	15	70	17	4.06	19
South Carolina	287	25	460	18	61	23	98	7	6.01	11
Tennessee	323	23	562	13	50	28	88	10	3.18	26
Texas	819	7	1130	3	32	32	44	30	4.73	14
Virginia	488	13	507	14	60	25	63	18	2.51	29
Washington	471	15	506	15	69	12	74	15	1.65	31
Wisconsin	379	20	473	16	66	16	83	12	3.85	20

12-year period of the study, at most California had 2,315 firms leave the state. Symmetrically over the same period, at most Florida had 1,799 arrive in the state. In- and out-migration flows tend to be correlated—the states that rank highest for out-migration of establishments tend to rank similarly for in-migration.

Migration patterns per million population to account for the size variation across states is also provided in Table 3, as the totals or levels bias large states such as California and New York. The normalized values indicate that these states are not as popular as they initially appear in terms of in-migration (or as undesirable as they initially appear in terms of out-migration). Perhaps more interestingly, even with the normalization, the flows are correlated—the states that have high establishment in-migration per million population tend to also have high establishment out-migration per million.

The dependent variable is the count of firms moving between each state-to-state pair. It is fundamental to the analysis to note that the movement of firms between state-to-state pairs is generally zero or small (Figure 1). For the relocations that do occur, the pairs with the most relocations are generally between large and neighboring states. For example, as a pair, New York to New Jersey is the most common relocation. On average, 46 firms per year in our sample made this move. For comparison, 26 firms on average per year moved the opposite direction from New Jersey to New York. As a second visual example, Figures 2 and 3 show the in- and out-migration relationships for Illinois, respectively. That is, the graphics show the direction of flows—both out of Illinois to each destination state (Figure 2) and into Illinois from each origin state (Figure 3). These flows reiterate the relationships discussed above in that movement between neighbors are among the largest flows and that often the most

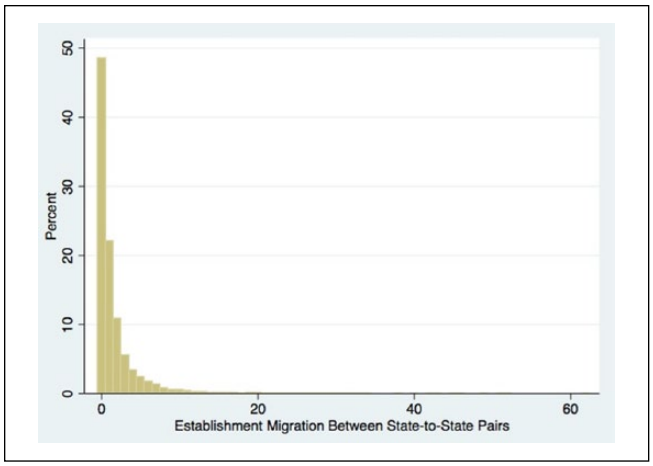

Figure 1. Histogram: Establishment migration between state-to-state pairs.

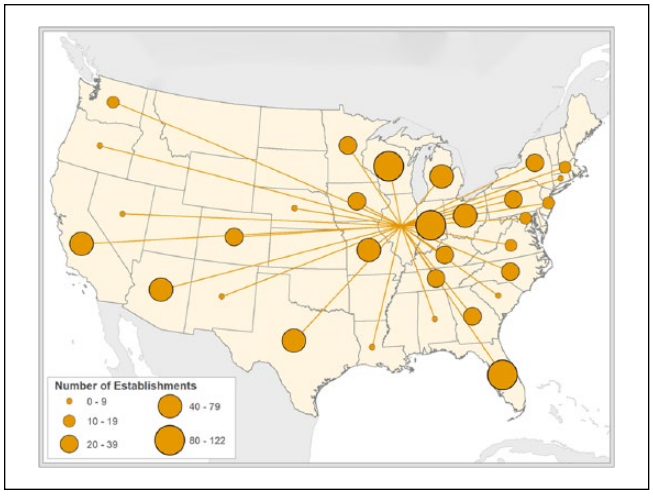

Figure 2. Destination state of manufacturing establishments moving from Illinois 2000 to 2011.

common state destinations for out-migrating firms are also the most common origin states for in-migrating firms.

Control Variables

The costs, quality, and availability of inputs required for business processes are among the most important considerations when making a relocation decision. We include several measures that approximate manufacturing inputs and the overall industrial environment in the state. First, high levels of manufacturing concentration should signal historically favorable conditions for this sector in terms of adequate infrastructure, well-developed networks of suppliers and producer service providers, among other things. The literature consistently finds that a concentration of one industry attracts new entries in this or closely related industries (Deller, 2009; Strauss-Kahn & Vives, 2009). Thus, our model includes a share of

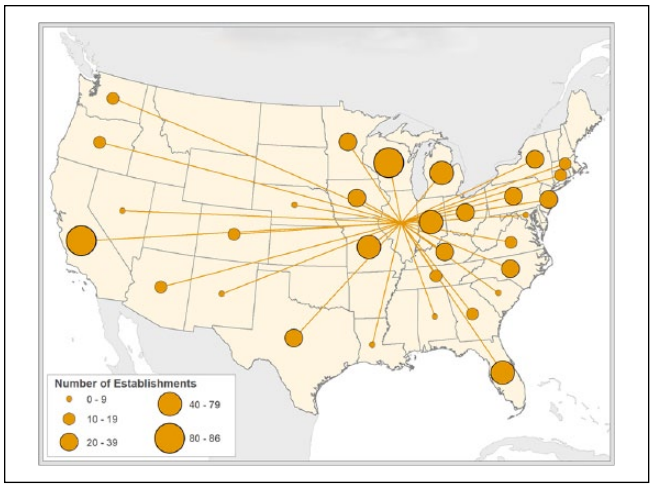

Figure 3. Origin state of manufacturing establishments moving to Illinois 2000 to 2011.

manufacturing employment in a state. We expect a higher concentration of manufacturing to create a self-reinforcing clustering effect (Asheim & Coenen, 2006).

To account for the costs of labor (both direct and indirect), we use average compensation per job in manufacturing and unionization rate in a state. In line with the evidence that manufacturers generally prefer to locate in less unionized states (Conroy et al., 2015, 2016, 2017; Lee, 2008), we expect the coefficient on the unionization variable to be negative. As for the compensation, while higher costs should, in theory, deter inward relocations, the effects are likely to differ by the level of knowledge utilization within an industry.

We approximate the availability and quality of labor in a state by three measures: unemployment rate, share of adult population with at least a bachelor's degree, and the individual poverty rate. States with higher levels of unemployment may offer a cheap and abundant labor force and may be attractive to manufacturing firms looking for a new location. This factor, however, might be of little relevance to some manufacturing industries; for example, those heavily reliant on knowledge. Nevertheless, with low-tech manufacturing generally shifting to the developing countries, the composition of the sector in the United States shifts to require more skilled labor. Even though the demand for highly educated workers from the manufacturers might be relatively low, generally, including the share of the college-educated population is important because of the growing importance of manufacturing services (Evangelista et al., 2015; Guerrieri & Meliciani, 2005). This sector is an integral part of the recent evolution of manufacturing in the developed countries and it relies heavily on an educated labor force, particularly in the more R&D-intensive segment. The educational attainment is a standard approximation for the quality of human capital in a region. Here again, the expected effects are likely to differ among industries depending on the specific production processes and on the degree of knowledge intensity. In contrast,

Table 4. All Manufacturers: Selected Incentive Variables Coefficient and Marginal Effect of a One Standard Deviation Change.

	Coefficient	Marginal
Property tax	2.8184*	0.0372*
	(1.5687)	(0.0207)
State corporate income tax	33.6786***	0.2071***
	(3.5167)	(0.0217)
Job creation tax credit	−7.4259**	−0.0450**
	(3.0178)	(0.0183)
Customized job-training grants	−109.4048***	−0.1560***
	(15.0399)	(0.0213)
Research and development	−42.2062***	−0.1091***
(R&D) tax credit	(7.5207)	(0.0194)
Property tax abatements	−24.6055***	−0.2215***
	(2.4065)	(0.0215)

Note. Robust standard errors in parentheses.
*$p < .1$. **$p < .05$. ***$p < .01$.

Table 5. Manufacturers by R&D Intensity: Selected Incentive Variables (Coefficients).

	Low R&D	Medium R&D	High R&D
Property tax	3.6688*	4.7335	−0.4861
	(1.9047)	(2.9094)	(3.2997)
State corporate	29.0724***	44.3976***	48.2918***
income tax	(4.7379)	(5.8336)	(6.4499)
Job creation tax	−2.4062	−10.7197***	−12.1257**
credit	(4.5284)	(3.7531)	(5.7269)
Customized job-	−120.0646***	−80.0909***	−247.4106***
training grants	(19.1778)	(17.0306)	(41.3796)
Research and	−171.4630***	−60.2182***	−42.2635***
development	(47.9763)	(14.2228)	(7.6238)
(R&D) tax credit			
Property tax	−26.6077***	−35.6255***	−35.1641***
abatements	(2.9249)	(4.2955)	(5.0983)

Note. Robust standard errors in parentheses.
*$p < .1$. **$p < .05$. ***$p < .01$.

higher poverty rate can indicate lower labor quality, which would make relocation less desirable.

Our models also include average electricity rate in a state. The costs of energy are likely to factor into a relocation decision, particularly for firms with energy-intensive production processes. We expect a negative coefficient on this variable.

As firm owners or managers making a relocation decision are likely to consider personal taxes that employees will face in a new location, the models include individual income tax in a state per $1,000 of personal income. Although taxes increase firms' costs and generally make a location with high taxes (both personal and business) less desirable, governments use taxes to provide public goods and services, some of which may be valued by firms or by their owners and managers. For example, taxes pay for public education, which is vital to the productivity of the workforce, and for the transportation infrastructure necessary for shipping and other services. To control for the effects of public goods and services, we include public spending per $1,000 of personal income on: K-12 education, higher education, welfare programs, highways/roads, and corrections. The direction of the effects is an empirical question and would depend on preferences of individual firms who are likely to balance the costs of the services they prefer against the importance of these services for business success.

In addition to our main explanatory and control variables, the estimated models include a dummy equal to 1 if two states share a border. Relocations predominantly happen for short distances, often between neighboring states (Conroy et al., 2015). To account for the business cycle, we add year fixed effects, which capture economic and other shocks affecting all states in the same manner. Finally, the model includes destination-state fixed effects to allow for a unique attractiveness level (e.g., as a result of general perception about the state being a good or not-so-good destination). Even with a large body of control variables, it is possible that some degree of endogeneity persists, although we hope that our approach minimizes this concern.

Empirical Results

The negative binomial estimation results for the whole sample are presented in Table 4 followed by results for each of the three subsamples defined by the industry R&D expenditures (low, medium, and high) in Tables 5 and 6. We report both the coefficients and marginal effects of a 1 standard deviation change for the variables of interest. While the former show the direction of the relationship, the latter give a better sense of how a change in any one of our incentive variables would influence relocation decisions (economic magnitude of the response). In reality, some policy changes, although statistically significant, would not likely generate a significant impact on the economy. Thus, we pay special attention to the economic magnitude of the effects. For brevity, we discuss the results on the incentives variables only, while the results for the whole model including the control variables are shown in Appendix Table A1, published online as a supplement to this article. In the final step, we rerun the analyses separately for the 2000 to 2006 and 2007 to 2011 periods to assess whether there was a change in the effects caused by the Great Recession. Appendix Table A2 (published online as a supplement to this article) exhibits the corresponding full results for the two time periods.

For the interpretation of the results, recall that the variables are measured as the value in the origin state less the value in the destination state: $\Delta x_{ij} = x_i - x_j$. This method implies that if the difference is positive, the variable takes on a higher value in the origin state *i* compared with the destination state *j*. For example, a positive and significant coefficient on the tax rate means that the higher tax rate in state *i* is associated with greater outmigration to the low-tax states. That is, a positive coefficient implies that low values of a

Table 6. Manufacturers by R&D Intensity: Selected Incentive Variables (Marginal Effects of a One Standard Deviation Change).

	Low R&D	Medium R&D	High R&D
Property tax	0.0374*	0.0315	−0.0025
	(0.0194)	(0.0193)	(0.0171)
State corporate income tax	0.1178***	0.1500***	0.1373***
	(0.0193)	(0.0199)	(0.0185)
Job creation tax credit	−0.0089	−0.0472***	−0.0335**
	(0.0168)	(0.0166)	(0.0159)
Customized job-training grants	−0.1284***	−0.0984***	−0.1138***
	(0.0203)	(0.0207)	(0.0188)
Research and development (R&D) tax credit	−0.0579***	−0.0709***	−0.0937***
	(0.0162)	(0.0167)	(0.0168)
Property tax abatements	−0.1828***	−0.1605***	−0.1279***
	(0.0199)	(0.0192)	(0.0183)

Note. Robust standard errors in parentheses.
*$p < .1$. **$p < .05$. ***$p < .01$.

variable (i.e., corporate taxes) are attractive to manufacturing firms and negative coefficients imply a higher value of a variable (i.e., spending on higher education) is attractive.

Results for the whole time period are as expected (Table 4). Lower taxes and higher incentives appear to stimulate inward manufacturing migration. On face value, these results support the traditional view of business climate and that incentives are effective. In particular, the state corporate income tax and property tax abatements are most effective in incentivizing relocation. In terms of magnitude of the effects, however, the findings are more modest. For example, a 1 standard deviation increase in the difference between the origin and destination state in property tax burden (1.5% of the value added in the sector) and in state corporate income tax burden (0.7% of the value added in the sector) is, on average, associated with 0.037 and 0.207 more manufacturing establishments moving in, respectively.

As an illustrative example consider the origin state of Illinois and one aspect of incentives, namely corporate income tax, in 2006, the midpoint of our study. Based on differences, Pennsylvania is the least desirable state in that it has the highest income tax and no firms move there from Illinois. Nevada is the most attractive state in that it has zero corporate income tax. Our results suggest that if Pennsylvania went from being the least attractive state to the most attractive state, like Nevada with zero income tax, it would amount to just over two (2.33) additional firms migrating there from Illinois.[5] To give a sense of the size of the change, going from the least to most attractive state for firms in Illinois, a potentially large policy change, is equal to nearly 3 standard deviations in our sample. Furthermore, this assumes no other states make changes to the corporate income tax.

Turning to tax abatements, credits, and grants, a 1 standard deviation increase in the incentives offered to a manufacturing firm (as a percentage of value added in the sector) would increase in-state migration within the range of 0.045 to 0.222 moves. That is, the economic magnitude of the effects may be less than desired by policy makers in terms of in-migration relative to the expense of reducing taxes or offering higher incentive levels.

When we decompose manufacturing into three levels of innovation, as defined by the R&D expenditures (Tables 5 and 6), the pattern is consistent with the one reported in Table 4. As expected, there are some variations in the sensitivity of the three subsectors to particular types of taxes and incentives, but the differences are not sufficient to alter the policy implications. Only firms in industries with low R&D levels are somewhat insensitive to the differences in the property tax (significant at the 10% level only). State corporate income taxes, on the other hand, are important for relocation decisions of manufacturing companies regardless of the R&D intensity of the industry to which they belong. A 1 standard deviation increase in the difference between the origin and destination state corporate income tax burden is related to moving in of additional 0.118, 0.15, and 0.137 manufacturing establishments in low R&D, medium R&D, and high R&D industries, respectively.

A job-creation tax credit influences manufacturers in medium and high R&D industries only, but not manufacturers in the low R&D manufacturing sector. This could be driven by differing expectations of employment growth across industries or by the unequal labor costs of each additional worker. In essence, manufacturers in low R&D manufacturing may be creating jobs that are generally not eligible for job creation tax credits. In the more knowledge-intensive industries, job creation tax credits can help offset higher wages that are likely to be paid to employees. The remaining three types of incentives are statistically important for companies in all subsectors. The magnitude of the effects can be viewed as roughly approximating the importance of each incentive type for business operations of each specific subsector. For example, the magnitude of the R&D tax credit effect uniformly increases with the knowledge intensity of the industry. Property tax abatements, to the contrary, are linked to larger responses from firms in the low R&D manufacturing and lower responses in the high R&D part of the sector. Property-related outlays are likely to constitute a larger share of the overall costs of business for companies producing less sophisticated products either because of the lower revenue streams or the need for larger production facilities. Finally, customized job-training grants are most important in the low- and high-R&D manufacturing industries with the lowest coefficient in the medium R&D industries.

The marginal effects (Table 6) of the incentives are quite small, particularly for the job creation and the R&D tax credits, where a 1 standard deviation increase in the difference between the origin and destination state is related to increased in-migration of between 0.034 and 0.094 establishments.

The corresponding numbers for the customized job-training grants range from 0.100 to 0.128, and for the property tax abatements from 0.128 to 0.183, depending on the R&D intensity of the industry.

As a simple robustness check, we reestimated all the models with data from prior to the (2000 to 2006) and post (2007 to 2011) Great Recession (Appendix Table A2, published online as a supplement to this article). Two observations are noteworthy. First, we find some changes in the magnitude of the coefficients, but the directions and statistical significance of the key policy variables remain largely unchanged. Second, and more important, the magnitude of the economic impacts of these policies remain very modest (Appendix Table A2, published online as a supplement to this article).

Discussion

Our results inform the policy debate on incentives with a more nuanced approach. First, the state-to-state differences approach reflects the way in which firms make decisions to relocate based on *relative* attractiveness. It is not the absolute level of taxes or incentives that matters but differences between the origin and destination states that determine the benefits of moving. A state may become relatively more attractive either by changing its ED policies or when other states (particularly the neighboring ones) become less generous. This further highlights the complexity of incentives in that regional interactions and strategic behavior are important in pursuing specific incentive or overall recruitment strategy. Because the vast majority of manufacturing relocations are from and to neighboring states, it is the relative tax position of those neighboring states that matters the most. How a state fares in national tax rankings is perhaps less relevant than its ranking relative to its immediate neighbors. Even then, policy makers should be aware of the size of the policy changes relative to their expected impact.

Second, we do find a statistically significant impact of incentives on the relocation of manufacturers across state lines, but the size of the effects must be considered with crafting policies. In this way, the findings lend themselves to more informed policymaking by demonstrating the expected size of the return for incurring the cost of incentives. On one hand, low property and, especially, corporate taxes are statistically significant drivers of manufacturing establishments' moves. Symmetrically, generous tax credits, grants, and abatements also attract firms. On the other hand, the magnitude of changes in tax and incentive policies (with the view of business in-migration as a goal) required to encourage one more manufacturer to relocate into the state may be infeasible. Policy makers need to have realistic expectations about the likely impact of policy changes. Our analysis suggests they may be viewed as small compared with the expense. Specifically, states would need to make substantial, even infeasibly large, changes relative to the mean to attract businesses in economically meaningful numbers. Combined with past evidence that most firms that move are quite small with fewer than 10 employees (Conroy & Deller, 2014), policy makers should be aware that even successfully recruiting several firms may have modest impacts on employment.

For those states that do use incentives for recruiting firms, this study illustrates which policies are most impactful. Even if small in magnitude, understanding the hierarchy of importance for firms of each policy can be useful for crafting incentive packages. While the effects of a 1 standard deviation change are well under one firm (Tables 4 and 6), the most impactful policy levers are generally the corporate income tax and property tax abatements. For policy makers engaged in recruitment, focusing on the state corporate income tax and property tax abatements is likely to yield the highest number of firms moving into the state.

One caveat of this study is that the data include firms of all sizes, whereas propensity to move is likely to be related to firm size. While it is less costly to move a smaller establishment, the implicit costs associated with its networks disrupted by a move may be higher outweighing the benefits of relocation. At the same time, small establishments may lack resources to explore alternative options in terms of location and usually suffer more from bounded rationality. They also are less likely to leverage their relocation for soliciting more lucrative attraction packages compared with larger firms. Given the very small number of interstate manufacturing relocations in every given year, however, an analysis by establishment size is likely to be less precise due to extreme overdispersion of the dependent variable.

Conclusion

This study is motivated by the continued popularity of policies that aim to attract companies from elsewhere, with a focus on traditional notions of business climate and targeted incentives as measured by the PDIT released by the W. E. Upjohn Institute for Employment Research. We build on Grassmueck et al. (2008) and Conroy et al. (2016) by looking at relative differences in incentives across U.S. states and their impact on the relocation decisions of manufacturing establishments. This study differs from much of the empirical literature because we model relocations, as opposed to the more general question of firm location decisions. Firms making the decision to relocate consider traditional location decision factors differently than firms looking to make a new investment. High fixed costs, particularly for manufacturers, make relocation more costly than initial location. Thus, attempts to recruit manufacturers from other states can be a costly proposition for the recruiting state.

Such recruitment policies are largely based on the insights gained from the neoliberal theory of firm *location* that predicts that firms tend to select a location that minimizes the costs of operation. Here taxes are viewed as a cost and to foster a positive business climate taxes must be reduced. Increasingly, part of this strategy centers on offering generous business incentives to further reduce costs thereby making the state more attractive to firms. Current research, however, argues that the relocation decisions are driven by a host of other factors, on top of simple monetary cost-benefit calculations, therefore cutting taxes and offering incentives may not generate desired change in business behavior.

Although we find that both taxes and incentives are statistically linked to relocation patterns in the expected ways (manufacturers tend to leave high-tax states in favor of low-tax states and to move to high-incentive states from the low-incentive states), the economic magnitude of such effects may be less than desired by policy makers. On average, a 1 standard deviation increase in the difference in taxes or incentives between the origin and destination state is associated with less than one establishment changing its location. This implies that business attraction policies, at least when it comes to the goal of inducing interstate business moves, may have to be quite large and/or used in combination to attract an economically significant number of firms.

To conclude, our study contributes to the large body of existing research that questions the effectiveness of business attraction strategies based on lower taxes and higher incentives in generating sufficiently large changes in economic activity. While the high costs of high-level business attraction projects are generally well understood, the analysis in this study assesses average effects for a representative firm. Despite the different focus, the conclusions are consistent. To induce an economically significant change in the number of establishments moving to a state, it has to generate a relatively large difference in the tax burden (substantially lower) and incentives (substantially higher) with the origin state. In sum, our research suggests that the cost of economic growth and development policies based on lowering taxes and increasing business incentives needs to be weighed carefully against their expected benefits in inducing manufacturing establishments to relocate.

Authors' Note

Yuxuan Pan is now affiliated with The Pennsylvania State University, University Park, PA, USA.
The opinions expressed are of the authors and under no circumstances can be taken to represent the opinion of the OECD or its member countries.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

ORCID iD

Tessa Conroy https://orcid.org/0000-0002-0120-297X

Supplemental Material

Supplemental material for this article is available online.

Notes

1. Another important consideration is the availability of talent, which is often an integral part of economic development (ED) programs within the so-called "entrepreneurial" approach, wherein economic opportunities are generated from within the territory as opposed to attracting business from outside (Hart, 2008). Despite the growing use of the entrepreneurial economic development policies, the locational approach is still widely used. For example, Turner and Cassell (2007) noted that expenditures on the locational programs are the major part of the economic development budgets in many states. Bartik (2017) estimated that in 2015 the costs of the business incentives for the whole nation could be around $45 billion. Bartik also observed that business incentives more than tripled since 1990, although the growth rate slowed after 2000.
2. The PDIT database includes 32 states and the District of Columbia. The latter is excluded from our analysis of manufacturers for continuity with our state-based control variables.
3. We use the following measures from the PDIT database to approximate economic development policies of a state: property tax, state corporate income tax, job creation tax credit, customized job training grants, R&D tax credit, and property tax abatements.
4. To create the index, we first normalize the incentives by calculating the ratio of each state's incentive x in year t to the average across all states for incentive x in year t $\frac{x_{st}}{\bar{x}_t}$. For tax incentives, we then take the inverse of the ratio $\frac{1}{\frac{x_{st}}{\bar{x}_t}}$ so that larger values represent more generous incentives similar to credits and abatements. In the instance of states with zero corporate income tax (Washington, Nevada, Ohio), replace zero with .001. The nonzero minimum is .003, so replacing the values in this way preserves the relative rank/desirability of these states and eliminates the issue of a zero denominator. We then sum across normalized incentive values to create an index for each state year. Last, we calculate the average for each state over the time period in the study.
5. The example was calculated by keeping Illinois fixed and identifying the highest (Pennsylvania) and lowest (Nevada) corporate income tax in destination states. After running the original model, we replaced the Illinois–Pennsylvania with Illinois–Nevada value and compare the predicted relocation value with the actual.

References

Asheim, B. T., & Coenen, L. (2006). Contextualizing regional innovation systems in a globalizing learning economy: On knowledge bases and institutional frameworks. *Journal of Technology Transfer*, *31*(1), 163-173. https://doi.org/10.1007/s10961-005-5028-0

Barnatchez, K., Crane, L. D., & Decker, R. A. (2017). *An assessment of the National Establishment Time Series (NETS) database* (Opportunity and Inclusive Growth Institute Federal Reserve Bank of Minneapolis System Working Paper No. 17-29). https://www.minneapolisfed.org/institute/working-papers/wp17-29.pdf

Bartik, T. J. (2017). *A new panel database on business incentives for economic development offered by state and local governments in the United States* (Report No. 225). W. E. Upjohn Institute. https://research.upjohn.org/reports/225/

Brouwer, A. E., Mariotti, I., & Van Ommeren, J. N. (2004). The firm relocation decision: An empirical investigation. *Annals of Regional Science*, *38*(2), 335-347. https://doi.org/10.1007/s00168-004-0198-5

Conroy, T., & Deller, S. C. (2014). *Wisconsin Establishment Migration: 2000-2011* (Patterns of Economic Growth and Development Study Series No. 1). Department of Agricultural and Applied Economics, Division of Extension, University of Wisconsin–Madison. http://trinaty.aae.wisc.edu/thewisconsineconomy/wp-content/uploads/sites/11/2015/01/MigrationReport-FINAL.pdf

Conroy, T., Deller, S. C., & Tsvetkova, A. (2015). *Factors affecting the interstate migration of manufacturing firms: Much ado about nothing?* (Staff Paper No. 578). University of Wisconsin–Madison.

Conroy, T., Deller, S. C., & Tsvetkova, A. (2016). Regional business climate and interstate manufacturing relocation decisions. *Regional Science & Urban Economics*, *60*(September), 155-168. https://doi.org/10.1016/j.regsciurbeco.2016.06.009

Conroy, T., Deller, S. C., & Tsvetkova, A. (2017). Interstate relocation of manufacturers and business climate. *Review of Urban and Regional Development Studies*, *29*(1), 18-45. https://doi.org/10.1111/rurd.12057

Deller, S. C. (2009). Overview of the firm location theory and TRED. In S. Goetz, S. C. Deller, & T. Harris. (Eds.), *Targeting regional economic development* (pp. 47-67). Routledge.

Deller, S. C., & Conroy, T. (2017). Business survival rates across the urban–rural divide. *Community Development*, *48*(1), 67-85. https://doi.org/10.1080/15575330.2016.1246459

Deller, S. C., & Goetz, S. (2009). Historical description of economic development policy. In S. Goetz, S. C. Deller, & T. Harris. (Eds.), *Targeting regional economic development*. Routledge.

Echeverri-Carroll, E. L., & Feldman, M. P. (2019). Chasing entrepreneurial firms. *Industry and Innovation*, *26*(5), 479-507. https://doi.org/10.1080/13662716.2018.1475220

Eisinger, P. K. (1988). *The rise of the entrepreneurial state*. University of Wisconsin Press.

Erickson, R. A., & Wasylenko, M. (1980). Firm relocation and site selection in suburban municipalities. *Journal of Urban Economics*, *8*(1), 69-85. https://doi.org/10.1016/0094-1190(80)90056-X

Evangelista, R., Lucchese, M., & Meliciani, V. (2015). Business services and the export performances of manufacturing industries. *Journal of Evolutionary Economics*, *25*(5), 959-981. https://doi.org/10.1007/s00191-015-0400-1

Feser, E. (2014). Planning local economic development in the emerging world order. *Town Planning Review*, *85*(1), 19-38. https://doi.org/10.3828/tpr.2014.4

Figueiredo, O., Guimarães, P., & Woodward, D. (2002). Home-field advantage: Location decisions of Portuguese entrepreneurs. *Journal of Urban Economics*, *52*(2), 341-361. https://doi.org/10.1016/S0094-1190(02)00006-2

Gabe, T. M., & Kraybill, D. S. (1998). Tax incentive requests and offers in a state economic development program. *Review of Regional Studies*, *28*(3), 1-14.

Gabe, T. M., & Kraybill, D. S. (2002). The effect of state economic development incentives on employment growth of establishments. *Journal of Regional Science*, *42*(4), 703-730. https://doi.org/10.1111/1467-9787.00278

Grassmueck, G., Goetz, S., & Shields, M. (2008). Youth out-migration from Pennsylvania: The roles of government fragmentation vs the beaten path effect. *Regional Analysis & Policy*, *38*(1), 77-88. http://www.jrap-journal.org/pastvolumes/2000/v38/F%2038%201%207.pdf

Guerrieri, P., & Meliciani, V. (2005). Technology and international competitiveness: The interdependence between manufacturing and producer services. *Structural Change and Economic Dynamics*, *16*(4), 489-502. https://doi.org/10.1016/j.strueco.2005.02.002

Halstead, J. M., & Deller, S. C. (1997). Public infrastructure in economic development and growth: Evidence from rural manufacturers. *Journal of the Community Development Society*, *28*(2), 149-169. https://doi.org/10.1080/15575339709489780

Hanley, C., & Douglass, M. T. (2014). High road, low road, or off road? Economic development strategies in the American states. *Economic Development Quarterly*, *28*(3), 220-229. https://doi.org/10.1177/0891242414534726

Hart, D. M. (2008). The politics of "entrepreneurial" economic development policy of states in the U.S. *Review of Policy Research*, *25*(2), 149-168. https://doi.org/10.1111/j.1541-1338.2007.00316.x

Hayter, R. (1997). *The dynamics of industrial location: The factory, the firm and the production system*. Wiley.

Hong, S. H. (2014). Agglomeration and relocation: Manufacturing plant relocation in Korea. *Papers in Regional Science*, *93*(4), 803-818. https://doi.org/10.1111/pirs.12029

Kronenberg, K. (2013). Firm relocations in the Netherlands: Why do firms move, and where do they go? *Papers in Regional Science*, *92*(4), 691-713. https://doi.org/10.1111/j.1435-5957.2012.00443.x

Lee, Y. (2008). Geographic redistribution of US manufacturing and the role of state development policy. *Journal of Urban Economics*, *64*(2), 436-450. https://doi.org/10.1016/j.jue.2008.04.001

Manjón-Antolín, M., & Arauzo-Carod, J. M. (2011). Locations and relocations: Determinants, modelling, and interrelations. *Annals of Regional Science*, *47*(1), 131-146. https://doi.org/10.1007/s00168-009-0360-1

McCarthy, L. (2015). Something new or more of the same in the bidding wars for big business? *Growth and Change*, *46*(2), 153-171. https://doi.org/10.1111/grow.12089

Neumark, D., Zhang, J., & Wall, B. (2007). Employment dynamics and business relocation: New evidence from the national establishment time series. In S. Polachek & O. Bargain (Ed.), *Aspects of worker well-being* (pp. 39-83). Emerald. https://doi.org/10.1016/S0147-9121(06)26002-3

Ozmen-Ertekin, D., Ozbay, K., & Holguin-Veras, J. (2007). Role of transportation accessibility in attracting new businesses to New Jersey. *Journal of Urban Planning and Development*, *133*(2), 138-149. https://doi.org/10.1061/(ASCE)0733-9488(2007)133:2(138)

Pellenbarg, P. H., van Wissen, L. J., & van Dijk, J. (2002). *Firm relocation: State of the art and research prospects* (Research Report 02D31). University of Groningen, Research Institute SOM (Systems, Organisations and Management), Groningen, Netherlands.

Pennings, E., & Sleuwaegen, L. (2000). International relocation: firm and industry determinants. *Economics Letters*, *67*(2), 179-186. https://doi.org/10.1016/S0165-1765(99)00269-4

Pred, A. (1967). *Behaviour and location: Foundations for a geographic and dynamic location theory: Part I*. University of Lund, Lund Studies in Geography.

Rink, D., & Swan, J. (1979). Product life cycle research: A literature review. *Journal of Business Research*, *7*(3), 219-242. https://doi.org/10.1016/0148-2963(79)90030-4

Rubin, H. J. (1988). Shoot anything that flies; claim anything that falls: Conversations with economic development practitioners. *Economic Development Quarterly*, *2*(3), 236-251. https://doi.org/10.1177/089124248800200304

Schmitt, N., Gleason, S. E., Pigozzi, B., & Marcus, P. M. (1987). Business climate attitudes and company relocation decisions. *Journal of Applied Psychology*. *72*(4), 622-628. https://doi.org/10.1037/0021-9010.72.4.622

Shaffer, R. E., Deller, S. C., & Marcouiller, D. W. (2004). *Community economics: Linking theory and practice*. Blackwell.

Simon, H. A. (1957). *Models of man: Social and rational*. Wiley.

Stallmann, J., & Deller, S. C. (2011). State tax and expenditure limitations, business climate, and economic performance. *Public Budgeting & Finance*, *31*(4), 109-135. https://doi.org/10.1111/j.1540-5850.2011.00995.x

Stokan, E. (2013). Testing Rubin's model 25 years later: A multilevel approach to local economic development incentive adoption. *Economic Development Quarterly*, *27*(4), 301-315. https://doi.org/10.1177/0891242413491315

Strauss-Kahn, V., & Vives, X. (2009). Why and where do headquarters move? *Regional Science & Urban Economics*, *39*(2), 168-186. https://doi.org/10.1016/j.regsciurbeco.2008.07.001

Tsvetkova, A., Conroy, T., & Thill, J.-C. (2019). Surviving in a high-tech manufacturing industry: The role of innovative environment and proximity to metropolitan industrial portfolio. *International Entrepreneurship and Management Journal*. Advance online publication. https://doi.org/10.1007/s11365-019-00591-8

Tsvetkova, A., Thill, J.-C., & Strumsky, D. (2014). Metropolitan innovation, firm size and business survival in a high-tech industry. *Small Business Economics*, *43*(3), 661-676. https://doi.org/10.1007/s11187-014-9550-z

Turner, R. C., & Cassell, M. K. (2007). When do states pursue targeted economic development policies? The adoption and expansion of state enterprise zone programs. *Social Science Quarterly*, *88*(1), 86-103. https://doi.org/10.1111/j.1540-6237.2007.00448.x

Weterings, A., & Knoben, J. (2013). Footloose: An analysis of the drivers of firm relocations over different distances. *Papers in Regional Science*, *92*(4), 791-809. https://doi.org/10.1111/j.1435-5957.2012.00440.x

Author Biographies

Yuxuan Pan is a graduate student pursuing a PhD degree in the Department of Agricultural Economics, Sociology and Education and Northeast Regional Center for Rural Development at Pennsylvania State University. Her interests include regional economics, community economic development, and policy related applied microeconomics.

Tessa Conroy is an assistant professor and community development economist with the Center for Community Economic Development, Division of Extension, University of Wisconsin–Madison. She is also an affiliate of the Department of Agricultural and Applied Economics. Her research and Extension educational programs are aimed at better understanding the changing regional economy, with a focus on the role of entrepreneurship and women in regional economic growth and development.

Alexandra Tsvetkova is an economist and policy analyst at the OECD Trento Centre (Italy), where she manages activities of the Spatial Productivity Lab. Before joining the OECD, she was affiliated with The Ohio State University and George Mason University. Her research on drivers of regional and local growth in the United States has appeared in *Small Business Economics, Energy Economics, Regional Science & Urban Economics, Economic Development Quarterly*, and other journals.

Matthew Kures is a community development specialist with the Division of Extension at the University of Wisconsin–Madison. Working in partnership with Extension's statewide network of resources, he assists communities and organizations through regional economic analyses, labor market studies, and industry competitiveness assessments. His current research includes the spatial diffusion of information and communications technology, interregional labor migration, and changes to long-distance commuting patterns.