

Appendix M: Findings of peer-reviewed research

There are three distinct strands of empirical literature that examine the economic effects of economic development incentives: establishment and firm-based analyses of economic incentives, macro studies of incentives using regional-level data, and macro studies of the regional effects of firm relocations on local economic activity. The former studies explore whether the incentive has an effect on the economic performance of the businesses receiving them; that is it measures the extent to which incentives are awarded to projects that would have proceeded without assistance. These studies utilize either firm survey responses, National Establishment Time Series (NETS) data based on Dunn and Bradstreet longitudinal firm records, ES202 payroll employment unit records or other state/federal confidential data to infer the effects of incentives on firm/establishment behavior. The latter studies attempt to gauge the effect of firm attraction on the local economy. Generally speaking, macro-level studies are more plentiful because regional-level data is more readily available; they are also more likely to find small or negligible effects of economic development incentives. These findings may partly reflect the relatively small size of the policy stimulus in relation to the size of the regional economy being modeled and the inherent difficulties of controlling for non-observable factors that complicate policy identification. In addition, several studies have examined the economic impact of known firm expansion and relocation activity on regional economic activity, often showing that the economic impacts of firm relocations are significantly less than what are suggested by ex-ante models such as input-output models.

Regional economic impact estimates may be larger or smaller than business level impacts. They may be smaller because of

- direct displacement effects due to the firm providing goods or services in a market area that compete with other regionally based suppliers;
- indirect displacement effects or general equilibrium effects that result from increases in wages, housing prices, and other goods prices as a result of the new firm activity;
- congestion effects—increases in public good congestion (e.g., transportation) due to the new firm activity; and
- fiscal impact effects—increases in local tax rates or reductions in public services needed to balance local government budgets (Patrick 2016).

In some instances (e.g., high-tech or knowledge intensive businesses, large manufacturing plants), multiplier effects may be greater than what are suggested because of spillover effects (Greenstone, Hornbeck, and Moretti 2010). They may be higher as a result of conventional supply-chain economic multiplier effects. Moreover, higher economic impacts are usually observed when the project contributes toward or takes advantage of agglomeration effects.

Expected program impacts can also differ based on the program performance metric used. If employment is used as a performance metric to assess capital investment incentives, the effect is not clear-cut. Investment tax incentives lower production cost by lowering the cost of capital. Depending on the exact configuration of the firm's production function, the magnitude of capital and employment effects can vary. Further complicating the analysis, some categories of labor such as skilled labor may be complements rather than factor substitutes. A lower cost of capital will create a substitution effect, meaning that more capital is used to produce the given output level while fewer labor inputs are used. However, the fall in marginal production costs means that more product can be sold, creating an output effect that increases demand for both capital and labor. Job creation will occur if the output effect outweighs the negative substitution effect. Some corroboration can be found that investment tax credits increase capital formation (Chirinko and Wilson 2008).

The empirical studies are mainly statistical analyses that examine particular types of incentives, including job creation incentives, small business loan assistance, equity assistance, and capital investment programs. There is a broader literature that looks at economic development incentives in general terms, lumping job creation, investment, research & development, geographically targeted, "deal closing," and other incentives together to evaluate a general "economic incentive," which is not included.

Summary of economic development incentive empirical research

Economic impact of job creation incentives						
Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Pope & Kuhle 1996	Job creation and training tax credits	California	Firms	Analysis of variance	Survey data	Smaller firms and firms with less excess capacity appear to be more responsive to job creation tax credit. Training tax credit does not have significant effect on employee retention.
Faulk 2002	Job creation tax credit	Georgia	Firms	Selection model	ES202	Georgia's Jobs Tax credit accounts for 23-28% of tax credit recipient job growth.
Sohn & Knaap 2005	Job creation tax credit	Maryland	Zip code areas	Panel	Census Bureau County Business Patterns	Incentives for geographically targeted program has small effects for certain sectors (i.e., TCU and services).
Hicks & LaFaive 2011	Job creation tax credit	Michigan	Counties	Panel	BEA REIS	No change in county-level total employment or income. Transient effect on construction employment.
Chirinko & Wilson 2016	Job creation tax credit	U.S.	States	Panel	BLS CEW	Net impact of JCTCs is positive. However, fiscal foresight (firms decreasing employment in anticipation of incentive) accounts for about one third of measured employment-boosting effect.
Jensen 2017b	Job creation tax rebate	Kansas	Establishments & firms	Coarsened exact matching, entropy balancing, & propensity score matching	NETS survey data	Statistical results indicate no effect of incentives on employment. Survey results indicate that approximately 20% of firms report they would have hired fewer workers without incentive.
Newark & Grijalva 2017	Job creation tax credit	U.S.	States	Panel	BLS QCEW	Job creation credits promote gross hiring during recessions. Refundable credits, recapture provisions, and unemployed worker targeting enhance impact. These credits may also create more gross hiring than net employment growth due to job churning (hiring and firing).

Economic impact of training incentives						
Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Holzer et al. 1993	Training grant	Michigan	Firms	Panel	Survey data	Training grant increased training amount in year of receipt but not after. Also, increased training associated with reduced scrap rate.
Economic impact of small business loan programs						
Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Price Waterhouse 1992	SBA 7(a) program	U.S.	Firms	Non-random comparison group	Survey data	Loan recipients were more likely to be in business and grew faster than comparison group.
Bradshaw 2002	State Loan Program	California	Firms	Non-random comparison group	Survey data	Loan recipient employment grew faster than comparison group of all California firms.
Craig, Jackson & Thomson 2007	SBA guaranteed loan programs	U.S.	MSAs and Non-MSA counties	Panel	BEA REIS, BLS	Positive relationship between relative levels of SBA loans and county per capita income growth.
Chandler 2012	Canada Small Business Financing Program	Canada	Firms	Regression comparisons that account for program self-selection	Survey on financing of small & medium enterprises	SSBFP participation increased employment and salary growth by 12%.
Young et al. 2014	SBA guaranteed loan programs	U.S.	Counties	Spatial panel	BEA REIS	SBA loans per capita associated with decrease in county income growth.
Brown & Earle 2017	SBA 7(a) and 504 programs	U.S.	Firms	Panel with IV	Census Bureau data – confidential business register	Every \$1 million in SBA lending activity is associated with 3.5 jobs.

Economic impact of equity investment incentives						
Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Carpentier & Suret 2007	Investment company program QBIC	Quebec Province, Canada	Firms	Comparison group	Firm data and Financial Performance Indicators for Canadian business data from Statistics Canada	Tax incentive benefited family and friends investors. Firm beneficiaries more likely to be relatively low return lifestyle businesses.
Barkley, DiFurio & Leatherman 2004	State venture capital program	Kansas	Firms	Comparison group and duration model	ES202	Assisted firms added more jobs than comparison group. Firms had significantly higher survival rates.
Zhao & Ziedonis 2012	State debt/convertible loan R&D financing program	Michigan	Firms	Regression discontinuity	Michigan Dept. of Licensing and Regulatory Affairs database	Assisted firms had significantly higher survival rates.
Gullickson 2014	Angel investment tax credit	Iowa	Firms	Before & after comparison of tax credit recipients to unsuccessful applicants	NETS	Assisted firms had similar survival rates to unassisted firms, but higher employment and sales.
Schulte 2016	Angel investment tax credits	U.S.	States (KS, MN, TN, WI)	Longitudinal pre-test post-test with control group	Bureau of Labor Statistics Occupational Employment Statistics	State angel tax credits are not associated with technology job growth
Barker 2017	Angel investment tax credits	Iowa	States	Panel data	Kauffman Foundation entrepreneurial data based on various public data sources	Tax credit availability is associated with share of business scale-ups and density of high growth companies but not average growth rate of startups.

Economic impact of capital investment incentives

Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Chirinko & Wilson 2008	Investment tax credits (ITC)	U.S.	States and counties	Panel	Census Annual Survey of Manufacturers	ITC induces additional capital formation but effect on establishment counts is small.
Patrick 2014	Capital investment incentives	U.S.	Counties	Random trend model	BEA REIS	Incentives have no effects on county employment levels or growth.

Economic impact of firm relocation and expansion

Paper	Type of program	Geographic region	Units of analysis	Method	Data source	Findings
Greenstone & Moretti 2003	Large plant openings	U.S.	Counties	Panel with matching	Census Bureau County Business Patterns	Counties that won a large manufacturing plant experienced a 1.5% increase in total earnings.
Edmiston 2004	Plant openings and expansions	Georgia	Counties	Panel	BEA REIS	Multipliers of new firm locations are less than one; expansions have average employment multipliers of two.
Fox & Murray 2004	Large establishment openings	U.S.	Counties and MSAs	Panel	NA	Location of a large firm does not stimulate county/metro area employment or income.
Patrick 2016	Large plant openings	U.S.	Counties	Panel with geographic proximate matching	BEA REIS	Location of a large firm has a modest effect on county economic activity but does not generate fiscal surplus.

SOURCE: Weldon Cooper Center.