Export Sectors and Rural Development[1]

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Abstract: The *export base model* states that development depends on production activities that sell products outside the region. It is commonly assumed by rural economic development proponents. But the model is contested by modern growth theory, and there has been surprisingly little research about its empirical relevance. This paper investigates the 'export-led growth' hypothesis for rural development in the United States. We measure export orientation by the initial share of total employment in export sectors in a base year in rural U.S. counties, and look at subsequent development outcomes such as rural capital accumulation, rural job growth, rural poverty rates, and rural income by sector. Overall, the results reject the export-led growth hypothesis. Although initial export intensity is associated with higher initial levels of income per capita, subsequent rural employment and rural per capita income growth are significantly negatively correlated with initial export intensity. Subsequent rural poverty rates are also higher in rural counties with higher initial employment in export sectors. We discuss a number of reasons why the export base model does not appear to apply, including that (1) current account surpluses are associated with *capital account deficits*, (2) export sector activity is riskier, making export-intensive counties less attractive to other types of investment; (3) rural area export sectors - in the mature phase of the *product cycle*- either grow slowly or decline, (4) relatively slow-growing export sectors may *crowd out* other types of faster growing sectors, and (5) rural export industries tend to be more prevalent in counties with *lower human capital*.

[1]We thank many readers for their comments including Tom Harris, Rose Olfert, and Euan Phimister. All remaining errors are our own.

Introduction

"The basic sector, which trades outside its boundaries, produces dollar flows into the local economy, which provides impetus for consequent economic development." (Harris, Shonkwiler and Ebai, 1999; p. 115). This statement summarizes the popular 'export base' idea that the key to rural economic development is to have large agricultural, mining, or manufacturing sectors that sell to urban or foreign markets. This model has long served those who believe that an export base is the primary cause of regional prosperity, or that export-led development describes historic U.S. regional development (North, 1955, 1956).

The export base strategy appeals on an intuitive level to the public and politicians. It says that in order to be prosperous, you have to sell more to outsiders than you purchase from them. In that sense, the export-base model is akin to sensible management of household finances and it is popular fodder for contemporary talk radio or TV. The hypothesis also plays many roles in the development economist's toolkit. It is assumed in order to define a closed-form solution for popular input-output or 'multiplier' analyses. The model also appears to apply most directly to rural areas because it is often argued that little else can employ people in small or remote communities.

The strategy of promoting a region's export industries is neo-mercantilism. The Mercantilists of the 16th – 18th centuries, an era before paper money/fiat currencies, believed that a country's assets were increased only by sustaining a positive balance of trade, paid for in gold bullion. They believed that trade is a zero-sum game where the winners accumulate gold (and the losers get real goods). Modern economists measure welfare in real terms rather than gold. Following Adam Smith, economists have rejected the mercantilist model, arguing that reciprocated trade benefits both parties to the extent that exports enable imports, by which both parties enjoy a wider mix and larger amount of goods. If not, countries would not trade. But exporting more than what's needed to finance imports is not necessary.

Furthermore, it is a simple accounting identity that a region's capital account is by definition equal to the negative of the current account balance. One implication is that trading partners who import more, or, who are allowed to have current account *deficits,* are enjoying more from trade in the short term or until they have to pay the debt back. To benefit in the long run from short run current account deficits (capital account surpluses) the net imports must contribute to local investment that supports local growth.

> "If a region's earnings from exports exceed its outlays for imports, on net there is an exodus of productive resources from the region (as embodied in goods and services traded). In this sense the region is loaning its resources to other areas, the region is a net investor, or exporter of capital. By the same token, if imports exceed exports, the region is receiving a net inflow of capital from outside. *It is patently absurd to argue that the way to make a region grow is to invest the regions*

> *savings somewhere else, and that an influx of investment from outside is inimical to growth.* If anything, it would seem more plausible to infer that a regions growth is enhanced if its capital stock is augmented by investment from outside which means that the regions *imports should exceed its exports*. (Hoover and Giarratani, 1984; emphasis in original)

This diametrically opposing view -- that net importing leads development -- is the foundation of modern theories in which capital accumulation is fundamental to growth. If a region or a country has attractive investment opportunities that encourage net capital inflows (e.g., the U.S. 1870-1913 or during the 1990s), it will also have a current account deficit.

Regional and rural development economists have inherited a dilemma. On the one hand, export sectors are assumed to be "basic," by which is meant they lead and determine the growth of a region's economy. On the other hand, being a net exporter requires lending local capital outside the region. Another unsatisfactory aspect of the export base approach to modeling growth is that it is based on a static identity equation interpreted as a dynamic causal process. Because the export base model is taken as an article of faith by much of the public and policymakers, we need to know if the model is empirically valid. In this paper we econometrically investigate the validity of the export base model and alternative hypotheses about rural development in the modern United States.

In the next sections we summarize various hypotheses about the relationship of export sector activity to growth. Then we describe the data and explain our econometric approach. We focus on the relationship between initial rural export orientation at the county level and the growth in total or nonbasic employment over the subsequent decade. We present and interpret the findings, referring to alternative theories of rural or regional development that focus on regional capital accounts, risk, crowding-out, the product-cycle, amenities, and human capital explanations, etc., as warranted. We conclude with a discussion of the implications for policy and future research.

Overall, we find that rural growth is significantly negatively related to rural export sector employment. We also find that contemporaneous growth in the local export sector is not conducive to nonbasic growth. We show, however, that the lower levels of human capital that characterize export-intensive rural communities, higher variability, and the slower job growth characteristics of export sectors, underlie why export-intensive rural economies tend to lag. We also show that although being remote and amenity-poor also contributes to low rural growth, there is no significant correlation between those features and rural export intensity.

Related Literatures

There are four types of related empirical research. The first and most prevalent type accepts the export base model on its face (e.g., Lee, 1982; Mulligan, 1984; Szyld, 1985; Richardson, 1985; Stabler and Howe, 1988; Haggblade, Hammer, and Hazell, 1991; Doyle, Mitchell, and Topp, 1997; Partridge and Rickman, 1998; Hill and Brennan, 2000). These represent some of the most highly cited articles concerning regional economic development using input-output models, that rely on the assumption that export sector activity is wholly exogenous and that it can lead and determine subsequent economic activity in a region.

The second type of related empirical research focuses on the measurement of export base multipliers. An export base multiplier is a coefficient on export sector employment in reduced form equations for total or local (non-basic) employment. The motivation for this type of research is to produce more accurate local or regional employment forecasts, which are valuable in their own right. For example, considering Ohio metropolitan areas, LeSage (1990) identified a statistically significant long-run cointegrating relationship between export and non-basic employment. Considering the fifteen rural counties in Nevada, Harris et al., (1999) also found that basic and nonbasic sector employment is cointegrated, regardless of how basic employment is measured. Cointegration does not, however, imply causation. Cointegrated series can be jointly caused by other variables in a system. Harris, et al. also investigated, but found no evidence, that basic sector employment temporally leads nonbasic sector employment. In fact, they found that changes in non-basic sector employment were *inversely* related to prior basic or export sector employment.

Other researchers, however, have not found a stable relationship between the levels of employment in export sectors and employment over time. Brown et al. (1992) and Coulson (1993) conclude that there are no economically meaningful cointegrating relationships between base and nonbase sectors when considering large metropolitan areas.

The assumption that exogenous or external shocks explain overall employment has also been disputed. Coulson (1993, 1999) found that local shocks are more important than national shocks. Coulson (1999) did, however, show that basic sectors tend to explain more local economic *variability*. One interpretation is that export sectors are more variable in general than local sectors, regardless of the origin of shocks (Partridge and Rickman, 2003). It should be remembered that the primary goal of this second strand of research is forecasting, not hypothesis-testing about the role of export sector employment in subsequent economic growth.

The third type of empirical research primarily seeks to measure the relationship of rural economic growth or decline to sectoral composition (Barkley, 1995). This research is surprisingly sparse. And there is surprisingly little support for the export base model. Goetz and Debertin, 1996, for example, showed that natural resource dependent rural communities have struggled for decades, regardless of exogenous injections of support payments to farmers; see also Drabenstott, 2005. Wagner and Deller's (1998) econometric analysis showed that higher levels of local stability and local growth are positively associated with economic diversity -- rather than export base specialization, while Henry et al. (1997) and Partridge et al. (2007) argue that rural-urban linkages are also important. Likewise, Edmiston (2004) finds that new large plant sightings are only associated with a multiplier of 0.3, well under the multiplier derived in impact analysis. Finally, at the broader level, export-oriented manufacturing ("rustbelt") and farm states have long lagged the national average in economic growth.

The fourth type of related research investigates other models of regional and rural development, focusing on the role of bank credit (Barkley and Helander, 1985; Collender and Shaffer, 2003), the level of human capital (Simon and Nardellini, 2002), agglomeration economies (Partridge and Rickman, 2003), amenities (Deller et al., 2001; Ferguson et al. 2007). Bank credit, human capital, agglomeration economies, and amenities have all been shown to be positively associated with subsequent rural growth.

Models of the role of exports in growth

By 'rural growth' we mean increases in rural employment or increases in rural real income per capita, all else equal. Real growth follows increased resource and factor use, or more productive resource or factor use. With respect to increasing the number of spatially mobile factors of production in a region, research confirms that people migrate away from places that are unpleasant or offer uncertain future work opportunities (Clark and Hunter, 1992; Deller, et al., 2001; Partridge and Rickman, 2003). Productivity growth is constrained by, among other things, new investment. New investment is constrained by available funds, which can come from retained earnings, external financing, donations, or subsidies. In the simplest terms, when people obtain funds today to acquire more land, labor, or productive equipment; make their locality a more attractive place to live; or invest in effective productivity enhancements; their locality grows tomorrow.

Model 1: Exports cause Growth

Mercantilists believe that a country's assets are increased only by sustaining a positive balance of trade by being a net exporter. According to (Shaffer, 2000) the export-base theory upon which regional input-output or 'impact' models are based is a neo-mercantilist notion. To derive the canonical export base model, start with the GDP (gross domestic product) identity equation:

1) $$Y \equiv C + I + G + X - M$$

Where Y is the gross product/income/ or expenditure of all agents in the region; C is private consumption, I is private investment, G is government spending, X is exports, and M is imports; all in value terms. A Keynesian version of this model embeds the behavioral assumptions that consumption and imports are increasing functions of income: $C = cY$ and $M = mY$, and that government spending equals current tax revenues: $G = tY$. The key assumptions are that the level of export activity and the level of investment are both exogenous.

The 'reduced form' GDP identity equation is:

2) $$Y = [1/(1 - c - t + m)](X + I).$$

The derivatives of Y with respect to I and X are known as *investment* and *economic-base multipliers*:

3) $$\partial Y/\partial I = \partial Y/\partial X = 1/(1 - c - t + m) > 0 \qquad \forall\, c,m,t \ni t < 1 - c + m.$$

The export base model also assumes temporal priority of exports. Changes in exports are assumed to be followed by increases in nonbasic or local sector activity. In the empirical section of this paper, we investigate the temporal priority of exports by estimating the empirical validity of the claim that $\partial Y_t/\partial X_{t-j} > 0$ in assessing whether greater export intensity supports faster local growth.

Note that according to these equations, an *investment multiplier* is just as potent as an *export multiplier*. If we also formalize that there is an exogenous, subsistence, or autonomous level of consumption, local sectors would also have the same multiplier effect as exports or investment (Tiebout, 1956a, 1956b).

Equation (3) suggests that the larger is the share of exports in local activity, and thus the larger is the share of imports in local consumption ($C \rightarrow M$ and thus $c \rightarrow m$), the closer the export base multiplier is to 1 (abstracting from the public sector: G, $t = 0$). The implication is that in a rural county where most all the households either farm, mine, or work in factories, and from which everyone drives to the city for groceries and entertainment, each dollar earned will gross just one more dollar earned.

In sum, the equations defining the export-base multiplier do not strictly imply that having a large export sector is any better than having a large autonomous service sector or enjoying more investment from outside. Indeed, as discussed above, the equations suggests that in the limit, the larger is the share of export activity in total local activity, and thus the more locals rely on imports for what they consume, the lower is the multiplier. See Swales (2005) for the range of conditions that influence the size of the export-base multiplier.

Model 2: Export Sectors Crowd Out other Activity

In his classic exchange with North, Tiebout (1956a, 1956b) argued that the export base model overlooks how a larger export sector can crowd out non-export activities. And as shown by Leven (2000), the *ceteris paribus* assumption about employment or income in non-export sectors is often untenable. An increase in the derived demand for employment in export sectors may simply draw resources away from local activities, with multipliers of their own (Tiebout, 1956a; Edmiston, 2004). For example, a local manufacturing sector may grow simply by taking employees out of the local retail sector. In other words, the assumption of a perfectly elastic supply of labor may not hold. It is possible in such circumstances for export multipliers to be less than 1, or even negative (see also McVittie and Swales, 1999; McGregor, et al, 2000; Goodman, 2003).

Model 3: The Balance of Payments

Because future growth depends on current investment, understanding what increases rural investment is key to understanding rural growth. Respectable development economists who believe that exports cause growth also assume that export earnings are the main private source of funds. In fact, retained earnings are the single largest source of funds for new investment. It is also reasonable to expect that rural exporters have larger sales than rural establishments that produce for the local market alone. If greater sales volumes support more retained earnings, this is a plausible rationale for a belief that regional or rural investment depends positively on a preponderance of rural export employment.

On the other hand, with respect to external sources of funds such as loans from commercial banks, the quantity of loanable funds that are imported into a region is inversely related to the region's net trade surplus. This implication also follows directly from both the GDP and the balance of payments identity equations:

4) $$I \equiv Y - C - G - X + M \rightarrow \partial I/\partial X < 0$$

Furthermore, because from the expenditure perspective, Y=C+S-T, the balance of payments identity is

5) $$X\text{-}M \equiv (S\text{-}I) + (tY\text{-}G)$$

Abstracting from government budget deficits (i.e., assuming government spending G is financed by tax revenue tY), again it is clear that investment is higher the lower are exports relative to imports:

6) $$I \equiv S - X + M \rightarrow \partial I/\partial X < 0$$

Hoover's perspective as quoted in the introduction can be formalized by these balance-of-payments identity equations. In sum, equations (4) and (6) imply that a region which exports more than it imports has less funds to invest. Taking temporal priority into account, it would gives us a completely contrasting alternative hypothesis of export-led *decline*: $\partial Y_t/\partial X_{t-j} < 0$.

Model 4: Employment multipliers

Export base models can be expressed in nominal terms, real (price deflated) terms, or in terms of employment. To express the model in terms of employment, start with the labor market identity equation that categorizes total employment (T) in sectors that produce for export (E) or local consumption (L):

7) $$T \equiv E + L.$$

While the demand for export-sector employees is derived from demand from outside the region, local sector employment can be modeled as having an autonomous part (A) and a part that rises with total regional employment (βT). The autonomous part (A) represents the number of persons who are needed locally to provide shelter, security, health care, education, and the like, regardless of the level of export employment. In addition, assume local-sector employment rises with regional population at a rate of β ($0<\beta<1$). With $L = A + \beta T$, the 'reduced form' of the total employment identity equation is:

8) $$T = [1/(1-\beta)] \bullet (E + A);$$

the *employment multiplier* is $[1/(1-\beta)]$. Note that β can also be calculated as $1 - (E/T) - (A/T)$. Below, we will show that in rural counties, the share of total employment in export sectors, E/T, is about 32%. Assuming autonomous employment is relatively low (say 18% of total), a plausible β is then about 0.5. This suggests that the total change in employment due to either a change "Δ" in exports or a change Δ in autonomous service sector employment is 2.0•Δ. Readers familiar with input-output or economic impact simulations of the effect a new plant opening, for example, will recognize this magnitude. In practice, the main tenet of the export base tradition is that long-term local prosperity is directly related to the initial size rather than the change in the export sector.

To this point we have reviewed the popular export-base model that is often used to explain rural growth and discussed alternatives. In the next section we empirically test the contention that a larger export base leads to more subsequent economic growth. We will also test alternative explanations of rural development related to balance of payments issues, crowding out, risk, the product cycle, human capital, and amenities.

Data and Empirical Implementation

To empirically investigate the dependence of rural growth on export activity, a U.S. county-level data base was constructed concerning the period 1980-2005. See Appendix Table 1 for details and summary statistics.[2] The focus of this paper is noncore rural counties, excluding micropolitan counties with urban cores of 10,000-49,999. Thus we study the smaller, often more remote counties that tend to be natural-resource or manufacturing intensive. Sensitivity analysis is conducted considering the micropolitan nonmetropolitan counties as well as metropolitan counties. Similar conclusions are found regardless of the scope of the county sample.

Our empirical approach mimics the estimation approach used by Ferguson et al. (2007) and Partridge et al. (2007; 2008). Those studies are based on a supply and demand, reduced-form model of employment and population growth, and are consistent with a Roback (1982) type model in which firms choose locations to maximize profits and households choose locations to maximize utility.

A maintained (untested) assumption is that export-intensive places are relatively abundant in the factors used intensively in export sectors. A place's initial export intensity may thus be predetermined by it's observable and latent characteristics. Because the market is larger, exporting firms are better able to enjoy internal scale economies and may be more profitable. Profitable firms can attract or finance more investment to grow the local economy. Export earnings would, in turn, support local household and business-input purchases, stimulating the growth of the local non-base sector. This is the export base hypothesis that rural counties with higher export intensities grow more than other rural counties. Indeed, the observed late 19th Century-early 20th Century growth of the manufacturing belt or the rise of the Midwest/Western U.S. farm and natural resource economies are consistent with this notion (North, 1955, 1956).

The alternative hypotheses include that export activity may crowd out other types of activity, export intensive places may have an adverse balance of payments (lower net capital inflows or higher net capital outflows), export firms may be less profitable, or, places that are export-intensive may be less attractive to people, all of which would result in export-intensive counties growing less than other counties.

A null alternative is that some places may be export-intensive in ways that have nothing to do with their comparative advantage. That is, inappropriate policies, the choices of absentee owners with no long-run interests in the localities, or other forces, have led to levels of export sector activity that are inconsistent with local comparative advantage. This 'null' case assumes that the mix and level of export sector activity

[2]The sample omits some very low population counties due to data disclosure issues. See Partridge and Rickman

is random. In that case we would expect no evidence of correlation between subsequent growth and export intensity.

The dependent variable representing rural growth is measured as the change from 1990 to 2000 and from 1990 to 2005 in place-of-work employment, population growth, per capita income growth, or by year 2000 and 2005 per capita income, as well as by 1999 median household income and poverty rates. By examining growth rates, however, we difference out possible fixed effects such as those associated with population levels or the size of the locality.

Growth measures are regressed on either initial conditions or on "deep lags" of the explanatory variables. This approach mitigates the problem of direct endogeneity. In our main model, the primary identifying assumption is that the initial size of the base sectors is predetermined. The other explanatory variables in our main model, such as distance to large urban centers, or natural amenities, are clearly predetermined or exogenous. To investigate the robustness of our main findings about the role of export or basic sector activities in growth with respect to alternative models of growth, we systematically consider alternative sets of explanatory variables.

For county *i* located in state *s* in year *t,* we specify the following main model of economic growth (GROWTH):

$$9)\quad \mathrm{GROWTH}_{i,\,t\text{-}0} = \alpha + \boldsymbol{\pi}\,\mathbf{EXPORT}_{i0} + \boldsymbol{\varphi}\,\mathbf{GEOG}_{i0} + \boldsymbol{\gamma}\mathbf{AMENITY}_{i0} + \sigma_s + \varepsilon_{i,\,t\text{-}0},$$

where the dependent variable is either measured as the level in year *t* or the growth rate between period 0 and *t*. **EXPORT** is a vector of variables that measure initial concentrations of basic or export sectors, **GEOG** is a vector including variables measuring distances to different tiers in the urban hierarchy, and the population of the nearest urban center, while **AMENITY** represents natural amenities. The regression coefficients are α and the vectors $\boldsymbol{\pi}$, $\boldsymbol{\varphi}$, and $\boldsymbol{\gamma}$; $\boldsymbol{\sigma_s}$ are state fixed effects that account for factors common to counties within a state; and ε is the residual. Subsequent models include other explanatory variables such as the change in export intensiveness or measures of human capital.

We measure a county's export intensity by the shares of total county employment in farming, mining, and manufacturing. Selecting these three as export sectors is known as the "assignment method." It is one of many plausible ways to estimate export-intensity. It is easy to use, and has been shown to perform as well as some of the more data-intensive and complicated measures in many cases (Harris, Shonkwiler, and Ebai, 1999). In most noncore counties, these three sectors are the major exporters. Business service

(2006) for details of sample construction.

export sectors generally play a very small role in remote small counties, as predicted by central place theory. Alternative measures of export intensiveness, described below, are also considered.

Many noncore rural counties are also high-amenity places that attract new residents (including retirees) and tourists, in which tourism may be another form of exports. The USDA Economic Research Service classifies about one-seventh of nonmetropolitan counties as recreation counties (Johnson and Beale, 2002). Though we are not ruling-out tourism as a possible export sector in such counties, it is not a traditional export sector according to the assignment method version of the export base model. Instead, we primarily control for amenity driven tourism-related growth through the underlying amenity variables described below.

Some of the spatial measures in **GEOG** reflect proximity to urban areas differentiated by their status in the hierarchy. The first measure is distance to the nearest metropolitan area (or "urban center") of *any* size, measured as the distance in kilometers from the population-weighted centroid of the rural county to the population-weighted centroid to the metro area.[3] Beyond the nearest metro area of any size, we also include the incremental distances to more populous higher-tiered urban centers to reflect additional "penalties" such as costs for households and businesses in acquiring higher-order services and access to customer markets (see Partridge et al., 2008).

These distances reflect the incremental or marginal costs to reach each higher-tiered (larger) urban center. We include the incremental distance in kms from the county to reach a metro area of at least 250,000, at least 500,000, and at least 1.5 million people.[4] The largest category generally corresponds to national and top-tier regional centers, with the 500,000-1.5 million category reflecting sub-regional tiers.

Note that a large source of current account earnings for many rural counties may be out-commuting. We do not directly measure the contribution of 'labor exporting,' nor do we suggest that out-commuting is a

[3]Sensitivity analysis will consider metropolitan counties. For a metropolitan county, this distance is from the center of the county to the center of the urban area. *Within* an urban area, the influence of longer distances would largely reflect any offsetting effects of agglomeration or sprawl. If it is a one-county urban center, this distance term equals zero (see Partridge 2008). Population-weighted county centroids are from the U.S. Census Bureau. The metropolitan population categories are based on 1990 population.

[4]For example, if rural county A is 40kms from the nearest metropolitan area and 130kms from the nearest metro area greater than 250,000 residents, the incremental distance to the nearest metro area would be 90kms. If the county is already nearest to a metropolitan area that is either larger than or equal to its own size category, then the incremental value is zero. For example, for a county already located next to a metro area greater than 250,000, the incremental value to reach a metro area of at least 250,000 would be zero. As another example, suppose rural county A is 80kms from its nearest metro area of any size (say 150,000 population), 140kms from a metro area >250,000 people (say 400,000), 220kms from a metro area >500,000 (which is say 3 million). Then the distances are 80kms to the nearest metro area, 60 incremental kms to the nearest metro area greater than 250,000 (140-80), 80 incremental kms to a metro area >500,000 (220-140), and 0 incremental kms to a metro area >1.5million (220-220). Given the tight linear relationship between actual and incremental distances, it is not surprising that our conclusions are unaffected when we substitute actual incremental distances (not shown).

component of a locality's "export base" as that was not a key feature of the export-base hypothesis. However, the above-described urban proximity variables are proxies for commuting. Distance variables also proxy for a locality's collateral base. That is because land rents and values are inversely correlated with distance to metro. A negative dependence of GROWTH on distance to metro variables could therefore indicate the relevance of a variety of factors, such as lower out-commuting or lower property values dampening growth, and either or both interpretations are consistent with the 'balance of payments' alternative hypothesis. If the distance coefficients do not accurately proxy for actual travel time, this could reflect measurement error that biases the coefficients towards zero—working against finding any statistically significant distance effects, though we expect these effects to be minor. [5]

The **GEOG** vector also includes the log of county's population, generally interpreted as a proxy for agglomeration economy opportunities in the county. The population of the nearest or actual metropolitan area is included to control for size or scale effects not entirely captured by the proximity variables (e.g., gravity effects in a commuting model include the population of the destination center).

Other control variables account for natural **AMENITIES** such as climate, topography, and an amenity metric from the U.S. Department of Agriculture (see Appendix Table 1). The **AMENITIES** vector includes some of the exogenous factors that may motivate households to relocate to the county to enjoy local amenities. Or, to reflect the aforementioned tourism activities and associated recreation industries.

State fixed effects are also included in most models to account for state-specific factors including policy differences, geographic location with respect to coasts, settlement period, or differing geographic size of counties (counties tend to be larger in the west). When state fixed effects are included, the other regression coefficients are interpreted as the average response for *within*-state changes in the explanatory variables.

Alternative models described below control for other factors or allow us to compare export base models with other models of rural growth. For example, one alternative specification controls for five education attainment categories and six age composition shares. Another model uses the share component from shift-share analysis to control the hypothetical growth rate in the county if all of its industries grew at the national rate over 1990-2000 period. Specifically, the initial 1990 industry share is multiplied by the ten-year national growth rate for that industry, with the corresponding value summed over all one-digit industries. The shift-share index is routinely used as an exogenous instrument because a given county's growth rate for a particular industry should not influence its national growth rate (Bartik, 1991; Blanchard and Katz, 1992).

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[5] With the developed U.S. road system, the distance terms should accurately proxy for travel time. For example, Combes and Lafourcade (2005) find that the correlation between distances and French transport costs is 0.97.

The county residuals are assumed to be spatially correlated within a given economic region but independent across regions. These regions correspond to the 177 functional economic areas from the U.S. Bureau of Economic Analysis. Using the Stata Cluster command, robust t-statistics are reported following this assumption. The advantages of this approach over other spatial autocorrelation corrections are that the magnitude of spatial autocorrelation can be unique to each region, and that actual economic linkages determine the type of spatial interactions rather than *ad hoc* or reduced form approaches such as contiguity alone.

Empirical Results

Stylized Facts

Less than 11% of the U.S. gross domestic product is earned in export sectors and 15% of U.S. domestic expenditure is on imports (Bureau of Economic Analysis, National Income and Product Accounts). The U.S. capital account surplus averages about 4 percent of GDP. Kilkenny and Johnson (2007) estimate that about 38% of non-metro county earned income is derived from mining, manufacturing, or commodity agriculture. They estimate that about 30 percent of nonmetro household expenditures are for goods and services imported from elsewhere—e.g., on manufactures (including food), higher education, most entertainment, etc. Together, the data suggest that nonmetro America is a net exporting region. If so, on net, capital flows out of rural areas, leaving less capital to invest in local endeavors.

Exporting and the Local Balance of Payments

We first investigate whether export intensity supports greater capital in the locality. Though the level of loanable funds and investment capital are not directly reported in available data, we indirectly proxy for the availability of financial capital by using bank deposits per-capita. We regress deposits per capita in 1994 (due to data availability at the county level for that year) on the shares of employment in export sectors, controlling for county characteristics, and state dummies. These results are reported in Table 1.

The results in column 1 show that all three export sectors have negative coefficients as hypothesized according to the alternative (anti-Mercantilist or Hoover's balance of payments) model of growth. But only the mining-sector share is significant at the 10% level (the other two export shares are significant at the 13% level). This is weak evidence *against* the claim that "the basic sector, which trades outside its boundaries, produces dollar flows into the local economy, …" (Harris, Shonkwiler and Ebai, 1999; page 115) in favor of the alternative balance of payments model. Further research about the balance of payments model is clearly warranted. For the purposes of this analysis, this preliminary evidence is inconsistent with the hypothesis that a larger local export sector promotes subsequent investment (or future economic growth).

Export Employment and Subsequent Local Employment Growth

Next we directly consider whether a larger local export sector is conducive to subsequent faster economic growth. First, column 2 of Table 1 reports the results of regressing 1990-2000 total county employment growth on the main parsimonious model, while column 3 reports the corresponding results substituting 1990 to 2005 county job growth as the dependent variable. Both sets of estimates are almost identical, with the exception that the coefficients for the longer 15 year period are correspondingly larger than for the shorter 1990-2000 model, consistent with five more years of employment growth being explained by each coefficient. For this reason, because we have more complete data availability, we will use 1990-2000 employment growth in the remainder of the analysis. Most importantly, subsequent job growth is significantly negatively related to all three 1990 export sector shares. The evidence contradicts our main export base model prediction that larger export shares promote greater economic growth.

We also explored whether these results are an artifact of our focus on the noncore rural counties by re-estimating the model using the nonmetropolitan county sample (by adding the micropolitan counties to the noncore sample). Nonetheless, these results (not shown) were virtually the same as the non-core results. The export base model does not appear to apply to rural counties regardless of the definition.

Some of the export-base model's more plausible predictions concern *nonbasic industry* growth. Total job growth is simultaneously related to export sector job growth. Less obviously biased by such simultaneity is non-export sector (nonbasic) employment growth. To examine this possibility, column 4 reports the results using 1990-2000 nonbasic employment growth as the dependent variable. These results suggest that subsequent nonbasic job growth is negative and significantly related to the 1990 mining share, but the other two basic or export sector employment shares are statistically insignificant. These results still do not support the export base model, but the evidence is less negative than before.

One concern is that initial export sector employment shares may be too narrow a measure of the effect of increasing exports, even if this approach is econometrically cleaner in terms of reduced endogeneity. We would also like to know if *changes* in nonbasic employment depend on *changes* in the export share. Does a rising export employment share lead increased nonbasic employment? The model reported in column 5 adds to the model shown in column 4 the 1990-2000 change in export share, where the 1990 and 2000 export shares are defined by simply summing the three export sector employment shares.

Increases in nonbasic employment might also cause increases in basic employment, which suggests that endogeneity is a concern. Yet, it strikes us as generally implausible that *local* demand for non-exportables in rural counties would mostly drive (say) commodity corn production (recall, the X variables are measured in the pre-ethanol era). However, any simultaneity bias is likely to be positive, making it ***more*** likely to conclude an export base supports nonbasic employment (or more likely to find in *favor* of the base-sector hypothesis). But the results in column 5 strongly suggest the opposite. The estimates suggest that export sector growth crowds out nonbasic sector employment. All three export share coefficients are negative and significant at the 10% level. The implication is that a key tenet of the export base model and the input-output models motivated by it -- that the expansion of an export sector will support increased nonbasic sector employment-- does not appear to apply to the typical noncore rural county in the U.S.

Why does export intensity appear to be so *bad* for rural growth? Is our model misspecified? What overriding factors might offset or countervail against positive export base effects? Or are alternative models simply better? To answer these questions we estimated several alternative models of rural growth.

Alternative Hypothesis: Export Intensive Places are Riskier

The traditional export sectors considered here display greater output variation (Partridge and Rickman, 2002). It is possible that where there is more risk, there is less investment in non-basic local businesses, while potential migrants may be deterred as well. To examine this possibility, we add three measures of risk. If the export sector regression coefficients decline in magnitude or reverse in sign when we add these variables, that would be evidence in that it is not exporting *per se* but the higher variability in demand for export output that undermines the efficacy of an export-base strategy for rural development.

Our first risk variable is a dissimilarity index that measures how much a respective county's industry composition differs from the national average. Deviations from the national average mix could lend itself to more variation in growth and in some cases, difficulties in attracting relocating workers. The dissimilarity index is calculated for county *c,* over all industries *j* with a national average *n* as $\sum_j \left| EmpShare_{cj} - EmpShare_{nj} \right|$, which reflects how much the county's industry structure varies from the national average.

Our second risk variable is the standard deviation of the growth *rate* of annual employment growth over the 1981-1990 period, which directly captures the local variability of the economy. Because it is the standard deviation around the county's mean growth rate over the decade, it reflects the variability around its 1980s trend growth. Yet, variability alone doesn't measure what is troublesome about risk. It has a different meaning in struggling economies (for example, Buffalo NY) versus rapidly expanding economies with significant variation (Las Vegas NV). Thus, we add an interaction of the standard deviation of employment growth with an indicator for counties that experienced negative employment growth over the 1980s. If perceptions of future risk undermine investment and thus subsequent job growth, this interaction variable will have a negative coefficient.

The results reported in column 6 show that the dissimilarity index is statistically insignificant, but the two employment risk variables are individually significant, with the expected signs. Moreover, the magnitudes of the export share coefficients are smaller in magnitude than in column 2, with the farm share variable no longer statistically significant at conventional levels. Thus, some of the adverse effects we find for the export sector are associated with the greater riskiness of export sectors, especially in farm dependent economies. Yet, most of the negative export intensity effect remains. We therefore continue to search for other explanations of the negative association between initial export intensity and subsequent growth.

Alternative Hypothesis: The Product Cycle Model

The ‘product cycle’ hypothesis offers another possible explanation for the failure of the export base model as a growth strategy. This theory argues that the location where a product is produced is a function of what stage it is in its life cycle. In particular, a product matures to the export stage, and declines thereafter. Thus, export-sector intensive places are likely to decline rather than grow.

The Product Cycle model is based on the theory of comparative advantage (Hoover, 1950; Vernon, 1966; Norton, 1986) and it has recently been reformalized in spatial general equilibrium by Duranton and Puga (2001). As predicted by *comparative advantage*, production of a product occurs where the factors used intensively are relatively abundant (Kim, 1999). Thus, we expect products to be *conceived* in first-world cities where there are relative abundances of creative and highly-skilled labor, loanable funds, and a large diverse final demand. If the product succeeds in the city market, its industrial production will be initiated near U.S. cities, where there is a relative abundance of engineers and loanable funds, while not being too far from the city market. As the product matures and production becomes standardized, the industrial activity relocates from urban and suburban to rural U.S. locations because of the relative abundance in unskilled labor and factory floor space. When U.S. consumers no longer purchase the old product, and only foreign export markets remain, firms have strong incentives to shut down production in rural U.S. counties and move production overseas. Even if output markets are more ‘stable,’ greater productivity growth over time will reduce employment—i.e., witness production agriculture or basic manufacturing.

The Product Cycle model provides a hypothesis that rural places with higher proportions of employment in export sectors are on the verge of decline because they are producing products (especially manufactured products) that are either in declining demand or at risk of being located to developing countries. Our finding that places with larger manufacturing shares experience lower subsequent job growth is consistent with the Product Cycle model. Moreover, there is a 0.47 simple correlation between the initial 1990 share of the population with a four-year college degree and subsequent job growth—i.e., places with more educated (and perhaps more creative) populations are associated with faster growth.

A particular rural county's ability to support product(s) in earlier stages of the cycle depends on the quality of its labor force. Hence, to examine the possibility of positive product cycle outcomes due to workforce quality factors, we re-estimate the main model in column 2 by adding the county's initial age structure and average educational attainment. If rural locations are not necessarily hampered by industry composition, but instead are hampered by not having high skilled labor or a favorable age structure, including these other determinants will reduce or eliminate the negative export share coefficients we found earlier.

Though similar to the test of the "risk" hypothesis, the results reported in column 7 indicate that the export share coefficients are only slightly smaller in magnitude than in column 2. We conclude that the shortcomings of the export base hypothesis in predicting employment growth is not primarily due to quality of the labor force that can affect the location's place in the product cycle. Labor force quality does, however, appear to underlie the relationship between export intensity and the local income measure of prosperity, described below.

Alternative Hypothesis: Slow Growing Sectors

Whether it is due to the product cycle, labor-saving productivity growth, global pressures, or changing demand patterns, export sectors have generally been growing slowly over time. If one controls for the expected growth of a county on the basis of its industry composition, then counties with larger "slow growth" basic or export sectors may actually fare better than counties with larger "slow growth" nonbasic sectors, *cet. par*.

To examine this, the model shown column 8 adds the 'share' component from shift share analysis, which is the predicted county growth if all of its industries grew at their respective national growth rates. This measures whether the county had a favorable or unfavorable industry composition in terms of expected job growth. These results suggest that for every one-percentage point greater industry mix job growth rate, overall county growth rate increases by about 1.27%, which suggests a small multiplier effect in rural areas. Note that this multiplier is small regardless of the source of new jobs—export or non-export. Moreover, the negative coefficients on the farm and manufacturing export shares are entirely eliminated, while the adverse mining share effect is substantially smaller. Thus, we conclude that one major reason for less growth in export-oriented rural counties is that those sectors are relatively slow growth, as implied by the Product Cycle model. Obviously, job growth-- regardless of the sectoral nature (export or service sector) is a primary reason for rural counties to fare well. Our results show that counties that attract expanding nonbasic sectors appear to be more likely to succeed than those that attract contracting export industries.

Alternative Hypothesis: Do Export Sectors Attract Residents?

Place-of-work job growth may be an insufficient metric to assess community vitality. For example, people 'vote with their feet' and locate in places that offer higher utility, which reflects a combination of traditional economic and modern quality of life attributes. These place-of-work job growth measures may not capture other attributes of an export-led strategy, and it could miss other factors such as commuting, which would not measure place-of-work job growth, but rather employment opportunities for residents.

To examine whether our job growth metrics are mis-measuring the effectiveness of export-based models, the specifications shown in columns 9 and 10 repeat the models shown in columns 2 and 5, but instead use the 1990-2000 change in log population as the dependent variable. The three industry export shares and the 1990-2000 change in export share are all significantly negatively related to population growth, suggesting that our findings are not an artifact of using job growth as our economic metric.

Exporting and Rural Income

As we said in the beginning, rural development generally means growth in either employment or income. It is also possible that although employment may grow less in places that specialize in export activities, their average incomes may be higher. Indeed, because of the competitive pressure, productivity is usually higher in export sectors than in sectors insulated from competition by high transport costs (Syverson, 2004). Higher productivity should be rewarded by higher factor returns, but it could be associated with declining employment growth if the productivity gains are primarily of the labor-saving variety that releases redundant labor.

We look for evidence of the claim that export sector activity supports higher rural household income in a variety of ways. First we re-estimate our base model using the natural log of 2000 per-capita income as the dependent variable—i.e., the level of income which would be associated with profits and wages. Then we examine whether a larger export sector is associated with income growth—measured by the 1990-2000 change in the log of per capita income.

Table 2 presents these results starting with the main parsimonious model in column 1. The mining and manufacturing shares are statistically insignificant, whereas a larger farm share is inversely related to the level of income. Thus, there is no strong evidence that a larger export sector in itself is associated with higher productivity-led income levels. Yet, when column 2 adds the 1990-2000 change in the overall export share to the model, the results suggest that a growing export sector is associated with greater levels of per-capita income and a larger 1990 manufacturing share is associated with greater per-capita income.

As described when discussing the Product Cycle model, rural areas may be characterized by lower human capital. Taking this into account by controlling for the age and education composition of the population, the export shares could be more positively linked to per-capita income—i.e., after accounting for their relatively low skill levels, if export sectors have high higher productivity and profits. Columns 3 and 4 examine this issue by adding the 1990 education and age-composition shares to the model. The dependent variable in column 3 is the 2000 level of log per capita income. Column 4 instead uses the log of 2005 per capita income to examine robustness to considering a later time period. In both cases, the results suggest that after accounting for the demographic conditions in the county, larger export sectors are positively related to income, though the farm-share coefficient is only marginally significant. Nonetheless, these findings indicate that rural areas specializing in export sector employment tend to be relatively abundant in less-skilled workers, consistent with the Product Cycle/comparative advantage hypothesis.

In related results that are not reported, when we add the industry mix job growth variable to the per capita income model, as expected, it is positive and statistically significant. Moreover, the export share coefficients are now positive and highly significant, further suggesting that the negative association between export intensity and growth is that export sectors are generally slow growing.   A general pattern throughout the remainder of the paper (even if not reported) is that income levels are positively related to whether the county had a composition of fast growing industries—export or otherwise.

Columns 5 to 7 of Table 2 now consider variations of these models using the 1990-2000 change in log per capita income as the dependent variable. In these specifications, the farm and mining share coefficients are negative and statistically significant, while the manufacturing coefficient is negative but insignificant. One conclusion is that regardless of whether demographic conditions are included in the model, a greater initial level of exports is not associated with faster income growth and may be associated with slower income growth. While export shares may be associated with higher per capita income (after controlling for demographics), this productivity or profitability advantage actually appears to decline over the decade.

Exporting and Income Distribution:

A larger export sector can also affect the income distribution of the county by creating jobs that are more conducive to improving incomes for the median family or for reducing the number of people living in poverty. To examine these distributional issues, columns 1 to 3 of Table 3 report three representative models using the 1999 median family income as the dependent variable, whereas columns 4 to 6 use the 1999 poverty rate as the dependent variable.

These results suggest that the manufacturing employment share is positively related to median family income, while the farm share's relationship depends on whether the specification accounts for the county's demographic characteristics. The mining share is statistically insignificant in these models. Similarly, in all three cases, the manufacturing share is inversely related to the poverty rate, while the farming share is inversely related to the poverty rate when the county's demographic conditions are accounted for. Yet, these suggest that a larger manufacturing sector is more beneficial to the lower half of the income distribution, while if one accounts for demographic factors, the same applies to farming.

Exporting: Urban vs Rural

Our focus is to examine the export base model's efficacy for truly rural counties. We have already noted that the broader nonmetropolitan county sample gives the same results as the noncore rural county sample. Focusing on the smallest rural counties has the added advantage of being able to more accurately assume that the export sectors are mostly represented by farming, mining, and manufacturing in the vast majority of cases and that the local export sector primarily markets outside the rural county. In urban areas, the issue of producer services and other non-traded good exports becomes more pressing. Yet, considering urban areas does allow us to assess the robustness of our findings. Thus, using a metropolitan county sample, Appendix Table 2 presents some alternative models using 1990-2000 job growth, log 2000 per capita income, and 1990-2000 change in log per capita income as the dependent variables.

Metropolitan job growth also appears to be inversely associated with the three trade sector shares. In terms of income levels, the results also continue to support the alternative hypotheses that these traditional export base industries are inversely associated with income levels. The results further suggest that greater export intensity is not strongly related to income growth. However, once accounting for the relatively 'weaker' demographic composition in counties with greater export bases, these export shares are generally positively related to income levels. One pattern is that the export sector appears to be somewhat more positively associated with metropolitan incomes than rural incomes, though the general conclusion is that urban patterns are quite similar to the noncore rural patterns. In sum, our findings are not an artifact of considering rural areas.

Conclusions

Any activity that brings previously unemployed resources into a locality and into production will increase the GDP of that locality (if the resources are locally-owned). The question is: which sectoral allocation of resources is optimal for local investment and local growth? Should export industries be favored, or can businesses that serve local demand grow a rural economy? Should policy be sector neutral, and the focus be on basic wealth creation, or should particular industries be favored?

In this paper, we reviewed the hypothetical dilemma inherited by rural development economists and empirically conducted the kind of specification search Leamer (1979) labels a 'hypothesis-testing search.' On one hand, export sectors have been assumed to be "basic," by which is meant they are both exogenously determined and that their growth leads and determines the growth of a region's economy, implying that export sectors should be favored. The testable hypothesis is that the coefficient on export sector activity in a model of growth is positive. On the other hand, capital must flow out of net exporting regions, the export sector crowd out other sectors; output variability is higher, and industries serving export demand are more likely to be declining industries; and the resulting coefficient is then negative. Our empirical investigation found no support of the 'export base' model of rural development.

We found no evidence that export-intensive rural counties grow faster than others. Indeed, the evidence suggests that the larger is the share of rural employment in basic or export industries, the lower is the rate of growth, or the faster is the rate of rural decline. Rural job growth is inversely associated with greater share of employment in export sectors. In addition, higher initial export intensity was associated with lower subsequent nonbasic employment growth.

Even contemporaneous increases in the county export share are associated with lower nonbasic job growth, suggesting that export employment merely 'crowds out' local employment. The crowding-out hypothesis is akin to Dutch Disease and Natural Resources Curse arguments that a larger natural resource-base is inversely associated with subsequent economic growth. For supporting evidence of Dutch Disease or the Natural Resource Curse using U.S. state data, see Papyrakis and Gerlagh (2007). In sum, the evidence is that rural counties with larger shares of employment in nonbasic or service sectors are more prone to grow (see also Barkley, 1995; Deller et al., 2001). Therefore, while the export base model may be a useful model to describe the initial development of American regions (*ala* North, 1956), it is less useful in describing the dynamics of mature, long-established rural economies in recent decades.

We also found that greater initial export intensity is weakly associated with lower subsequent bank deposits per capita, consistent the model that being a net exporter is inimical to growth, as argued by Hoover and other critics of the export base model.

These empirical findings are robust to alternative measures of rural development, alternative measures of explanatory variables, latent variables, misspecification, and alternative approaches to avoid simultaneity bias. We also estimated alternative models of rural growth. As noted above, the evidence favors the balance of payments model. The evidence also favors the product cycle model. In particular, we find that counties with more employment in fast-growing industries—export or otherwise—grow more than counties with larger concentrations of slow-growing export-oriented industries.

Rural counties that are export-intensive have slightly lower per-capita income, which is explained by lower human capital and demographic composition. And we found that the greater is the export intensity, the lower is income growth. Rural counties specializing in service sectors have higher rates of per capita income growth. Indeed, these results suggest that as Hoover (op.cit.) wrote, places "*can* get rich taking in their own washing." Nevertheless, one positive role of export sectors in rural U.S. is that income levels for the lower half of the income distribution are higher in manufacturing counties.

Our conclusions about the irrelevance of exporting *per se* are also consistent with the military-base closing literature, as surveyed by Poppert and Herzog, 2003. Because military bases are an exogenous expansion of government demand for the product of a local economy, traditional input-output models simulated rather devastating consequences from their closure. However, most ex-post empirical studies found near zero net longer-term consequences of base closures on local economies. That research also indicates that factors other than external final demand drives local economies (also see Edmiston, 2004).

The policy implications of these findings are clear. Despite the widespread popular appeal of the export base strategy, it is not recommended. What then? Should service sectors be promoted? Or, should policy focus on the broad foundation of quality of life and business profitability? Our findings point to amenities, urban linkages, and human capital considerations. Additional research is needed to identify which policies do succeed in promoting rural development.

The research implications of our findings are also clear. Input-output models are good for assessing the contemporaneous or static supply-chain linkages in an existing economy. However, the use of input-output models to simulate the effects on a rural county of an expansion in traditionally-defined "basic" activity does not appear to be empirically valid as a forecasting tool.

References

Barkley, David (1995) “The Economics of Change in Rural America.” *American Journal of Agricultural Economics* 77(5): 1252–58.

Barkley, David, and Peter Helander (1985) “Commercial Bank Loans and Non-metropolitan Economic Activity: A Question of Causality.” *Review of Regional Studies* 15(1): 26–32.

Bartik, Timothy J. (1991) *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, Mich.: W. E. Upjohn Institute for Employment Research.

Blanchard, Olivier J. and Lawrence F. Katz (1992). “Regional Evolutions,” *Brookings Papers on Economic Activity* (1): 1-75.

Brown, S., E. Coulson, E., R. Engle (1992) “On the determination of regional base and regional base multipliers.” *Regional Science and Urban Economics* 22: 619–635.

Clark, David, and William J. Hunter (1992) "The Impact of Economic Opportunity, Amenities and Fiscal Factors on Age-specific Migration Rates." *Journal of Regional Science* 32 (3):349-365.

Collender, Robert, and Sherrill Shaffer (2003) “Local Bank Office Ownership, Deposit Control, Market Structure, and Economic Growth.” *Journal of Banking and Finance* 27 (1): 27–57.

Coulson, E. (1993) “The sources of sectoral fluctuations in Metropolitan areas.” *Journal of Urban Economics* 33: 76–94.

Coulson, E. (1999) “Sectoral sources of metropolitan growth.” *Regional Science and Urban Economics* 29: 723-743.

Deller, Steve, Tsung-Hsui Tsai, David Marcoullier, and Donald English (2001) “The Role of Amenities and Quality of Life in Rural Economic Growth.” *American Journal of Agricultural Economics* 83(2): 352–65.

Doyle, C.J; Mitchell, M; Topp, K. (1997) “Effectiveness of Farm Policies on Social and Economic Development in Rural Areas.” *European Review of Agricultural Economics* 24 (3-4): 530-546.

Drabenstott, Mark (2005) “Do Farm Payments Promote Rural Economic Growth?” In *The Main Street Economist: Commentary on the Rural Economy*. Center for the Study of Rural America, Federal Reserve Bank of Kansas City, Kansas City, MO.

Duranton, Giles and Diego Puga, 2001. "Nursery Cities: Urban Diversity, Process Innovation, and the Life Cycle of Products," *American Economic Review* 91(5), 1454-77.

Edmiston, Kelly D. (2004) “The Net Effects of Large Plant Locations and Expansions of County Employment.” *Journal of Regional Science* 44: 289-319.

Ferguson, Mark, Kamar Ali, M. Rose Olfert, Mark D. Partridge (2007) “Voting with their Feet: Jobs Versus Amenities.” *Growth and Change* 38: 77-110.

Goetz, Stephan, and David Debertin (1996) “Rural Population Decline in the 1980s: Impacts of Farm Structure and Federal Farm Programs.” *American Journal of Agricultural Economics* 78(3): 517–29.

Goodman, Jay (2003) “Are Economic Development Incentives worth it? A CGE Analysis of Pueblo Colorado’s Efforts to Attract Business.” *Journal of Regional Analysis and Policy* 33(1):43-55.

Haggblade, S; Hammer, J; Hazell, P (1991) “Modeling Agricultural Growth Multipliers.” *American Journal of Agricultural Economics* 73 (2): 361-374.

Harris, Tom, Scott Shonkwiler, and George Ebai (1999) “Dynamic Nonmetropolitan Export-Base Modeling.” *Review of Regional Studies* 29(2):115-38.

Henry, M.S., Barkley, D.L. and Bao, S. (1997) “The Hinterland’s Stake in Metropolitan Area Growth.” *Journal of Regional Science*, 37(3): 479-501.

Hill, E. and Brennan, J. (2000) “A Methodology for Identifying the Drivers of Industrial Clusters: The Foundation of Regional Competitive Advantage.” *Economic Development Quarterly* 14 (1): 65-96.

Hoover, Edgar M. (1950) “Capital Accumulation and Progress” *American Economic Review*, 40(2):124-135.

Hoover, Edgar M., and Frank Giarratani (1984) *An Introduction to Regional Economics,* as reprinted (1999) for *The Web Book of Regional Science*. Regional Research Institute, West Virginia University. http://www.rri.wvu.edu/WebBook/Giarratani/main.htm.

Jacobs, J. (1985) *Cities and the Wealth of Nations: Principles of Economic Life*. New York: Random House.

Johnson, Kenneth and Calvin Beale (2002) “Nonmetro Recreation Counties Their Identification and Rapid Growth.” *Rural America* (17): 12-19.Available at: http://www.ers.usda.gov/publications/ruralamerica/ra174/ra174b.pdf.

Kilkenny, Maureen, and Stanley Johnson (2007) “Rural Development Policy” in *Agricultural Policy for 2007 Farm Bill and Beyond*, Bruce Gardner and Dan Sumner, editors; American Enterprise Institute, Washington, D.C. http://www.aei.org/research/farmbill/publications/pageID.1476,projectID.28/default.asp.

Kim, Sukkoo (1999) "Regions, Resources, and Economic Geography: Sources of U.S. Regional Comparative Advantage, 1880–1987." *Regional Science and Urban Economics* 29(1): 1–32.

Leamer, Edward (1979) *Specification Searches: Ad Hoc Inferences with Nonexperimental Data* John Wiley Series in Probability and Mathematical Statistics, Wiley & Sons, Inc.

Lee, K.S. (1982) “A generalized Input-output Model of an Economy with Environmental Protection.” *Review of Economics and Statistics* 64 (3): 466-473.

LeSage, James P. (1990) “Forecasting Metropolitan Employment Using an Export Base Error Correction Model.” *Journal of Regional Science* (30): 307-323.

Leven, Charlie (2000) “Net Economic Base Multipliers and Public Policy.” *Review of Regional Studies* 30(1):57-69.

McGregor, Peter et al., (2000) “The Neoclassical Export Base Multiplier.” *Journal of Regional Science* 40(1): 1-31.

McVittie, E. and Kim Swales (1999) “Sector-specific factor subsidies and Employment in a Regional Price-Endogenous Export-Base Model.” *Environmental and Planning A* 31(12): 2145-68.

Mulligan, Gordon F. (1984) “Agglomeration and Central Place Theory: A Review of the Literature,” *International Regional Science Review* 9(1): 1-42.

North, Douglas C. (1955) “Location Theory and Economic Growth.” *Journal of Political Economy* 63: 243-258.

_______. (1956) “A Reply.” *Journal of Political Economy* 64: 165-168.

Norton, R.D. (1986) "Industrial Policy and American Renewal," *Journal of Economic Literature* 24(March):1-40.

Papyrakis, Elissaios and Reyer Gerlagh. (2007) “Resource Abundance and Economic Growth in the United States.” *European Economic Review* (51): 1011-1039.

Partridge, Mark D. and Dan S. Rickman. (1998) “Generalizing the Bayesian Vector Autoregression Approach for Regional Interindustry Employment Forecasting.” *Journal of Business & Economic Statistics* 16 (1): 62-72.

_______. (2002) “Did the New Economy Vanquish the Regional Business Cycle?” *Contemporary Economic Policy* 20: 456-469.

_______. (2003) “The Waxing and Waning of U.S. Regional Economies: The Chicken-Egg of Jobs Versus People.” *Journal of Urban Economics* 53: 76-97.

_______. (2006) *The Geography of American Poverty: Is There a Role for Place Based Policy?* Kalamazoo, MI: W.E. Upjohn Employment Institute.

Partridge, Mark D., Ray Bollman, M. Rose Olfert and Alessandro Alasia. (2007) “Riding the Wave of Urban Growth in the Countryside: Spread, Backwash, or Stagnation,” *Land Economics* 83(2): 128-152.

Partridge, Mark D., Dan S. Rickman, Kamar Ali and M. Rose Olfert (2008). “Employment Growth in the American Urban Hierarchy: Long Live Distance.” *Berkeley Journal of Macroeconomics—Contributions.*

Poppert, Patrick E. and H. W. Herzog Jr. (2003) “Force Reduction, Base Closure, and the Indirect Effects of Military Installations on Local Employment Growth.” *Journal of Regional Science* (43): 459-481.

Richardson, Harry W. (1985) “Input-Output and Economic-Base Multipliers: Looking Backward and Forward.” *Journal of Regional Science* (25) 607-661.

Roback, Jennifer, 1982. “Wages, Rents, and the Quality of Life.” *Journal of Political Economy,* 90(6): 1257-1278.

Schaeffer, William A. (2000) *Regional Impact Models* http://www.rri.wvu.edu/WebBook/Schaffer/

Simon, Curtis and Nardinelli, Clark (2002) “Human capital and the rise of American cities, 1990-1990”. *Regional Science and Urban Economics* 32: 59-96.

Stabler, Jack C. and Eric C. Howe. (1988) “Service Exports and Regional Growth in the Post-Industrial Era.” *Journal of Regional Science* 28(3): 303-315.

Swales, J. Kim (2005) “Resource-Constrained Export-Base Regional Multipliers: A Northern Approach.” *Journal of Regional Science* (45): 223-250.

Syverson, Chad (2004) “Market Structure and Productivity: A Concrete Example.” *Journal of Political Economy* 112(6): 1181-1222.

Szyld, D.B. (1985) “Conditions For The Existence Of A Balanced Growth Solution For The Leontief Dynamic Input-Output Model.” *Econometrica* 53 (6): 1411-1419.

Tiebout, Charles M. (1956a) "Exports and Regional Growth." *Journal of Political Economy* 64:160-164.

_______. (1956b) “Rejoinder.” *Journal of Political Economy* 64:169.

Vernon, Raymond. (1966) "International Investment and International Trade in the Product Cycle." *Quarterly Journal of Economics* 80(2): 190-207.

Wagner, J., and Steve Deller, (1998) “Measuring the Effects of Economic Diversity on Growth and Stability.” *Land Economics* 74 (4): 541-556.

Table 1: Regression Results (Cluster Standard Errors)

Variables	1 1994 Deposits Per-Capita	2 Emp. Growth 1990-2000	3 Emp. Growth 1990-2005	4 Nonbasic Emp. Growth 1990-2000	5 Nonbasic Emp. Growth 1990-2000	6 Emp. Growth 1990-2000	7 Emp. Growth 1990-2000	8 Emp. Growth 1990-2000	9 Δ Log pop 1990-2000	10 Δ Log pop 1990-2000
1990 Farm Share	-4.219	-33.026**	-41.043**	1.773	-20.66*	-17.655	-20.521**	3.066	-.162**	-.181**
	(2.77)	(9.71)	(12.12)	(11.40)	(10.84)	(12.27)	(9.33)	(14.53)	(.059)	(.06)
1990 Mining Share	-6.011*	-121.94**	-139.695**	-83.836**	-120.96**	-107.39**	-122.336**	-59.182**	-.622**	-.652**
	(3.44)	(11.10)	(15.97)	(12.59)	(12.76)	(13.44)	(10.43)	(22.14)	(.0640)	(.07)
1990 Manufacturing Share	-2.926	-31.41**	-51.629**	3.947	-18.663**	-30.049**	-27.657**	2.25	-.0691*	-.088**
	(1.89)	(7.34)	(10.28)	(8.70)	(8.85)	(8.34)	(7.054)	(13.85)	(.0387)	(.04)
1990 Agric. Service Share	-5.523	-22.775	-13.168	-58.056*	-23.43	-12.72	-21.355	-57.36	-.132	-.102
	(9.43)	(31.02)	(47.98)	(33.20)	(33.58)	(31.44)	(28.46)	(35.04)	(.193)	(.20)
Dist to nearest MA (kms)	.00909**	-.0527**	-.0696**	-.0504**	-.0542**	-.0492**	-.0609**	-.0497**	-4.52E-04**	-4.54E-04**
	(.0029)	(.01)	(.017)	(.01)	(.013)	(.0125)	(.012)	(.0127)	(7.4E-05)	(7.47E-05)
Inc dist to metro > 250,000 pop	-3.52E-04	-.0211**	-.03813**	-.0257**	-.0209**	-.0173**	-.0238*	-.0192**	-2.88E-04**	-2.84E-04**
	(.0022)	(.01)	(.012)	(.01)	(.01)	(.008)	(.009)	(.0085)	(5.89E-05)	(5.91E-05)
Inc dist to metro > 500,000 pop	-.00611**	-.0204**	-.0342**	-.0128	-.0202*	-.020**	-.0224**	-.0176*	-1.46E-05**	-1.53-04 **
	(.0023)	(.01)	(.016)	(.0124)	(.01)	(.01)	(.010)	(.009)	(7.0E-05)	(7.0E-05)
Inc dist to metro > 1,500,000 pop	-.000415	-.0113	-.0202**	-.0142*	-.0130*	-.0105	-.013*	-.010	-9.79E-05**	-9.68E-04 **
	(.0023)	(.01)	(.01)	(.01)	(.01)	(.007)	(.007)	(.007)	(4.1E-05)	(4.1E-05)
1990-2000 Change in export share	n.a	n.a	n.a	n.a	-165.2**	n.a	n.a	n.a	n.a	-0.14**
					(17.53)					(.067)
Std. deviation 1981-1990 growth	n.a	n.a	n.a	n.a	n.a	.7484**	n.a	n.a	n.a	n.a
						(.308)				
Std. deviation × 1980s Decline	n.a	n.a	n.a	n.a	n.a	-1.099**	n.a	n.a	n.a	n.a
						(.209)				
Dissimilarity index	n.a	n.a	n.a	n.a	n.a	-9.177	n.a	n.a	n.a	n.a
						(5.70)				
1990-2000 Industry Mix	n.a	n.a	n.a	n.a	n.a	n.a	n.a	127.442**	n.a	n.a
								(48.82)		
Population[a]	X	X	X	X	X	X	X	X	X	X
Amenity[b]	X	X	X	X	X	X	X	X	X	X
State Fixed Effects	X						X			
Education[c]							X			
Age[c]							X			
Adjusted R^2	0.37	0.33	0.36	0.31	0.43	0.35	0.37	0.34	0.53	0.54
No. of counties	1294	1294	1294	1294	1294	1294	1294	1294	1294	1294

Notes: Robust standard errors using BEA regions and the Stata cluster command to address spatial autocorrelation within functional economic regions. A **or * indicates significant at ≤ 5% or ≤ 10% level respectively. X=included

a. 1990 Log Population variable

b. There are three amenity variables described in the text.

c. There are four education attainment variables and five age composition shares not including the omitted groups.

Table 2: Per-Capita Income Regression Results (Cluster Standard Errors)

Variables	1 Log 2000 Per-capita Income:	2 Log 2000 Per-capita Income:	3 Log 2000 Per-capita Income	4 Log 2005 Per-capita Income:	5 Δ Log Per-capita income 1990-2000	6 Δ Log Per-capita income 1990-2000	7 Δ Log Per-capita income 1990-2000
1990 Farm Share	-.195*	-.124	.129	.118	-.168*	-.166 *	-.165*
	(.10)	(.11)	(.09)	(.08)	(.09)	(.09)	(.09)
1990 Mining Share	-.028	.0904	.410**	.545 **	-.208**	-.205 **	-.204 **
	(.12)	(.125)	(.08)	(.09)	(.10)	(.10)	(.10)
1990 Manufacturing Share	.106	.178**	.268**	.235 **	-.0405	-.039	-.0430
	(.08)	(.078)	(.06)	(.05)	(.041)	(.04)	(.04)
1990 Agric. Services Share	.33	-.22	.886**	1.046**	-1.043**	-1.0456**	-1.085 **
	(.46)	(.44)	(.28)	(.29)	(.34)	(.33)	(.34)
Dist to nearest MA (kms)	-4.98E-05	-3.8E-05**	6.7E-05	1.468E-05	-1.95E-04	-1.95E-04	-1.68E-04
	(1.3E-04)	(1.3E-04)	(1.27E-04)	(1.3E-04)	(-1.2E-04)	(1.2E-04)	(1.2E-04)
Inc dist to metro > 250,000 pop	-9.77E-05	-1.132E-04	6.73E-05	1.113E-05**	-7.77E-05	-7.81E-05	-5.43E-05
	(9.9E-05)	(9.4E-05)	(7.41E-05)	(7.8E-05)	(7.3E-05)	(7.3E-05)	(7.7E-05)
Inc dist to metro > 500,000 pop	-2.05E-04**	-1.81E-04*	-1.09E-04	-1.373E-04*	-1.06E-04	-1.05E-04	-8.92E-05
	(9.67E-05)	(9.7E-05)	(7.63E-05)	(7.9E-05)	(8.2E-05)	(8.3E-05)	(8.1E-05)
Inc dist to metro > 1,500,000 pop	-2.81E-05	-3.21E-05	5.15E-05	-9.62E-06	-7.37E-06	-7.48E-06	1.63E-05
	(8.78E-05)	(8.51E-05)	(6.64E-05)	(7.0E-05)	(4.3E-05)	(4.3E-05)	4.17E-05
1990-2000 Change in export share	n.a	.528**	n.a	n.a	n.a	.014	n.a
		(.11)				(.09)	
Population[a]	X	X	X	X	X	X	X
Amenity[b]	X	X	X	X	X	X	X
Education[c]			X	X			X
Age[c]			X	X			X
Adjusted R^2	0.40	0.41	0.59	0.59	0.36	0.36	0.37
No. of counties	1294	1294	1294	1294	1294	1294	1294

Notes: Robust standard errors using BEA regions and the Stata cluster command are in the parentheses to address spatial autocorrelation within functional economic regions. A **or * indicates significant at ≤ 5% or ≤ 10% level respectively. X=included

a. 1990 Log Population variable

b. There are three amenity variables

c. There are four education attainment variables and five age composition shares not including the omitted groups.

Table 3 Median Income and Poverty Rate Regression Results (Cluster Standard Errors)

	1	2	3	4	5	6
Variables	Log 1999 Median family Income	Log 1999 Median family Income	Log 1999 Median family Income	Poverty Rate 1999	Poverty Rate 1999	Poverty Rate 1999
1990 Farm Share	-.1953**	-.153	.130*	-.899	-.899	-6.811**
	(.0928)	(.09)	(.07)	(2.88)	(2.97)	(2.52)
1990 Mining Share	-.141	-.070	.120	2.162	-.814	-12.748**
	(.132)	(.13)	(.09)	(4.20)	(4.14)	(3.69)
1990 Manufacturing Share	.1676**	.211**	.255**	-11.317**	-13.130**	-13.477**
	(.0736)	(.074)	(.05)	(2.91)	(2.92)	(1.85)
1990 Agric. Services Share	-.3700	-.436	.218	16.401	19.178	-15.167*
	(.3669)	(.36)	(.19)	(.15.04)	(14.74)	(8.32)
Dist to nearest MA (kms)	-4.73E-04 **	-4.66E-04	-3.83E-04**	.0190**	.0187**	.0106**
	(1.3E-04)	(1.3E-04)	(9.4E-05)	(.0046)	(.0046)	(.0034)
Inc dist to metro > 250,000 pop	-2.01E-04**	-2.10E-04	-1.06E-04**	.0107**	.0111**	.00268
	(8.5E-05)	(8.2E-05)	(5.1E-05)	(.0036)	(.0036)	(.0021)
Inc dist to metro > 500,000 pop	-4.63E-05**	-4.49E-04	-4.21E-04 **	.0176**	.0170**	.0139 **
	8.6E-05	(8.6E-05)	(6.8E-05)	(.0034)	(.0035)	(.00243)
Inc dist to metro > 1,500,000 pop	-1.2E-04	-1.27E-04	-8.02E-05	.00679**	.00689**	.0008
	(7.5E-05)	(7.4E-05)	(5.1E-05)	(.0029)	(.0028)	(.0018)
1990-2000 Change in export share	n.a	.314**	n.a	n.a	-13.245**	n.a
		(.09)			3.71	
Population[a]	X	X	X	X	X	X
Amenity[b]	X	X	X	X	X	X
Education[c]			X			X
Age[c]			X			X
Adjusted R^2	0.52	0.52	0.76	0.53	0.54	0.76
No. of counties	1294	1294	1294	1294	1294	1294

Notes: Robust standard errors using BEA regions and the Stata cluster command are in the parentheses to address spatial autocorrelation within functional economic regions. A **or * indicates significant at ≤ 5% or ≤ 10% level respectively. X=included

a. 1990 Log Population variable

b. There are three amenity variables described in the text.

c. There are four education attainment variables and there are five age composition shares not counting omitted groups.

Appendix Table 1. Data Definitions and Descriptive Statistics

Variable label	Variables Definition	Mean	Std Dev
Dependent Variables			
Total Employment Growth 1990-2000	Percentage change in total employment over 1990-2000; BEA	16.52	17.21
Total Employment Growth 1990-2005	Percentage change in total employment over 1990-2005; BEA	18.54	23.5
Change in log 1990-2000 Population	Change log 2000 and log 1990 population, or approximately the percentage change / 100.	0.096	0.133
2000 Log Per Capita Income	2000 Log Per Capita Income, BEA	9.93	0.18
2005 Log Per Capita Income	2005 Log Per Capita Income, BEA	10.12	0.18
Change in log 1990-2000 per capita income	ln (Y/cap)2000 – ln(Y/cap)1990 or approximately percentage change / 100, Source, BEA	0.39	0.12
Change in log 1990-2005 per capita income	ln (Y/cap)2005 – ln(Y/cap)1990 or approximately percentage change / 100 Source, BEA	0.41	0.08
1999 Log Median Family Income	1999 Log Median Family Income	10.51	0.17
1999 Total Poverty Rate	1999 Total Poverty Rate in percent	16.0	6.8
1994 Deposits Per Capita	1994 county deposits($1,000s)/1990 county population; Source: FDIC	11.29	4.96
Independent Variables			
Farm Employment Share 1990	1990 Percent/100 of total employment in agriculture; BEA	0.16	0.10
Mining Share 1990	1990 Percent/100 of total employment in mining; BEA	0.03	0.05
Manufacturing Share 1990	1990 Percent/100 of total employment in manufacturing; BEA	0.13	0.11
Agric. Services Share 1990	1990 Percent/100 of total employment in agriculture services; BEA	0.02	0.02
Non Basic Employment Share 1990	1990 Percent of nonbasic employment not in farm, mining, or manuf	67.97	10.06
Nonbasic employment Growth, 1990-2000	Percentage change in nonbasic employment 2000-1990, BEA	25.17	19.93
1990-2000 Change in export share	1990-2000 Change in export share or (Farm Share 2000+Mining Share2000+Manufacturing Share2000) -(Farm Share 1990+Mining Share1990+Manufacturing Share1990)	-0.05	0.05
Std. deviation 1981-1990 growth	Std. deviation of annual percentage change in employment between 1981-1990	3.7	2.1
Dissimilarity index, 1990	Dissimilarity index, 1990 is (two times) the percentage difference in the county's employment that would have to realign itself to have exactly the same one digit employment composition as the nation. The dissimilarity index is calculated for county *c,* over all industries *j* with a national average *n* as: $\sum_j \lvert EmpShare_{cj} - EmpShare_{nj} \rvert$	0.54	0.18
1990-2000 Industry Mix Employment Growth	The 'shift/share": the national rate of employment growth 1990-2000 (shift) times the county industry employment shares in each one-digit sector in 1990, summed across all sectors.	0.15	0.03
Distance nearest MA	Distance (in km) between centroid of a rural county and population weighted centroid of the nearest metropolitan area (source, Partridge et al., 2007)	103.48	61.49
Incremental Distance to reach MA >250,000	Incremental distance to the nearest/actual metropolitan area >250,000 1990 population in kms (source, Partridge et al., 2007)	76.22	115.34
Incremental Distance to reach MA >500,000	Incremental distance to the nearest/actual metro area with at least 500,000 1990 population in kms (source, Partridge et al., 2007)	45.44	69.04
Incremental Distance to reach MA >1.5 million	Incremental distance to the nearest/actual metro area with at least 1.5million 1990 population in kms (source, Partridge et al., 2007)	83.43	106.03
Nearest MA pop, 1990	Population of the nearest metropolitan area in 1990 (source, Partridge et al., 2007)	141275	101039

Log 1990 County Population	ln (1990 county population)	9.25	0.78
Mean January temp.	Mean January temperature (degree F)	30.85	12.37
Amenity Rank	Natural amenity rank; 1 to 7 (7 = best); USDA	3.42	0.98
Typography	Typography score 1 to 24, where 24 is the most mountainous terrain; USDA	9.20	6.62
Percent HS Grad 1990	Percent of 1990 population 25 years and over that are high school graduates; Census	35.26	5.83
Percent some college 1990	Percent of 1990 population 25 years and over that have some college; Census	15.28	4.31
Percent Associates Degree, 1990	Percent of 1990 population 25 years and over that have an associate degree; Census	5.01	2.26
Percent Bach. Degree, 1990	Percent of 1990 population 25 years and over that are 4-year college graduates; Census	10.97	4.11
Percent of pop<6yrs	Percent of 1990 population under 6 years	9.89	1.56
Percent of pop 7 to 17 yrs	Percent of 1990 population 7-17 years	17.23	2.33
Percent of pop 18 to 24yrs	Percent of 1990 population 18-24 years	17.22	4.16
Percent of pop 55-59 yrs	Percent of 1990 population 55-59 years	4.83	0.75
Percent of pop 60-64 yrs	Percent of 1990 population 60-64 years	5.11	0.96
Percent of pop over 65 yrs	Percent of 1990 population over 65 years old	17.2	4.2

N=1,294 Counties

a. Unless otherwise noted, all variables are from the 1990 or 2000 Census of Population. BEA is the U.S. Bureau of Economic Analysis; USDA is the U.S. Department of Agriculture Economic Research Service; FDIC is Federal Deposit Insurance Corporation.

Appendix Table 2: Selected Regression Results for the Metro Sample (Cluster Standard Errors)

Variables	1 1990-2000 Total Emp. Growth:	2 1990-2000 Total Emp. Growth:	3 Log 2000 Per-capita Income:	4 Log 2000 Per-capita Income	5 Log 2000 Per-capita income	6 Change in Log Per-capita Income 1990 -2000	7 Change in Log Per-capita Income 1990 -2000	8 Change in Log Per-capita Income 1990 -2000
1990 Farm Share	-48.260	-67.138**	-1.056**	-1.123**	.251*	.122	.0966	.339**
	(29.79)	(29.91)	(.18)	(.19)	(.14)	(.08)	(.08)	(.09)
1990 Mining Share	-142.239**	-165.970**	.159	.074	.320	.044	.0122	.072
	(32.05)	(34.74)	(.44)	(.44)	(.22)	(.071)	(.07)	(.08)
1990 Manufacturing Share	-60.785**	-75.940**	-.301**	-.355**	.20**	-.127**	-.147**	-.049
	(11.51)	(14.32)	(.07)	(.09)	(.07)	(.03)	(.034)	(.04)
1990 Agric. Service Share	263.703**	270.237**	1.401	1.425	.57	-.548	-.539	-.662
	(114.52)	(114.12)	(1.51)	(1.50)	(.69)	(.55)	(.54)	(.44)
Dist to center of own MA (kms)	.0517	.0525	-3.26E-05	-2.97E-05	2.72E-04	2.71E-06	3.80E-06	8.69E-05
	(.054)	(.054)	(5.2E-04)	(5.19E-04)	(3.5E-04)	(2.5E-04)	(2.5E-04)	(2.2E-04)
Inc dist to metro > 250,000 pop	-.0866**	-.0862**	-8.2E-05**	-8.2E-04**	-5.60E-04**	-3.11E-04**	-3.10E-04**	-2.51E-04**
	(.015)	(.015)	(1.3E-04)	(1.3E-04)	(1.0E-04)	(5.0E-05)	(5.0E-05)	(5.3E-05)
Inc dist to metro > 500,000 pop	-.0526**	-.0524**	-5.81E-04**	-5.81E-04**	-4.68E-04 **	-1.56E-04**	-.1.56E-04**	-1.43E-04**
	(.016)	(.016)	(1.1E-04)	(1.1E-04)	(7.8E-05)	(4.7E-05)	(4.7E-05)	(4.4E-05)
Inc dist to metro > 1,500,000 pop	-.00184	-.00125	-.3.91E-04 **	-3.90E-04**	-1.43E-04 **	-9.03E-05**	-8.95E-05**	-6.84E-05*
	(.0092)	(.0090)	(1.3E-04)	(1.3E-04)	(6.8E-05)	(3.7E-04)	(3.7E-05)	(3.7E-05)
1990-2000 Change in export share	n.a	-81.728*	n.a	-.293	n.a	n.a	-.110	n.a
		(31.28)		(.19)			(.10)	
Population[a]	X	X	X	X	X	X	X	X
Amenity[b]	X	X	X	X	X	X	X	X
Education[c]					X			X
Age[c]					X			X
Adjusted R^2	0.38	0.39	0.48	0.43	0.79	0.30	0.30	0.37
No. of counties	824	824	824	824	824	824	824	824

Notes: Robust standard errors using BEA regions and the Stata cluster command are in the parentheses to address spatial autocorrelation within functional economic regions. A **or * indicates significant at ≤ 5% or ≤ 10% level respectively. X=included; descriptive statistics available on request.

a. 1990 Log Population variable

b.There are three amenity variables described in the text.

c. There are four education attainment variables and there are five age composition shares not counting omitted groups.