Framing the Economic Potential of the Dallas Area
Editorial Summary

Overview

From 1990 to 2005, the Dallas metropolitan area grew faster than any other large U.S. metro region except metro Atlanta. That impressive display demonstrates the potential for future economic growth, but does not guarantee it. In this paper, Murdoch compares Dallas with 19 peer regions on factors linked to economic expansion. He pinpoints signs that bode well for the area, but also points out at least one significant threat to the region's economic future.

At the national level, conditions conducive to robust economic growth are well understood. Some of the most important conditions develop from the political and social environment rather than from investment in the physical means of production, such as having an educated population, democratization, trust, security, and liberty.

Historically, cities have been the center of the most intense economic activity, and their prominence as economic engines appears to be growing. However, factors associated with economic success at the metropolitan/city level are not as well understood as they are at the national level. In particular, research tends to combine data from a number of metropolitan regions, resulting in the loss of distinction between areas.

This paper takes a different path: It identifies the factors most closely linked to economic growth at the metropolitan/city level and compares the Dallas region to others of comparable size based on those variables. The intent is to identify the ways in which Dallas is well positioned and—perhaps more crucially from a public policy standpoint—the challenges that threaten the city's record as a growth leader.

Theoretical Framework

The economic academic literature provides data on the characteristics of cities that have increased economic output, as well as theories about the underlying causes for increase. Murdoch discusses the most well-documented theories, as mentioned here.

External economies of scale. Just as an individual firm may see per-unit production costs fall as production increases, a city's collective economic output may rise because of an increase in the number of firms doing business there. In theory, the clustering of varied enterprises lowers their combined costs for items or services they all need, such as an appropriate labor force or professional services such as legal and accounting firms.

Evidence is conflicting on whether this trend is more pronounced in industrially diverse areas or in those dominated by a few core industries. The combined data suggest diversity is more often associated with robust economic growth.

Knowledge generation. In recent decades, many researchers have explored how knowledge operates as what they call a “dynamic externality” (where externality means “by-product”) in the performance of regional economies. Data strongly support the notion that as knowledge accumulates, economic performance rises, which accelerates the production of knowledge, in turn accelerating economic growth, and so on.

Richard Florida has developed a set of metrics, or indicators, designed to predict a region’s ability to attract the “creative class” of knowledge workers. It focuses on intangible qualities such as tolerance as well as tangible assets such as quality arts and cultural offerings.

Racial and ethnic diversity. Research suggests this factor, formally known as “fractionalization,” can either promote or hinder economic efficiency, depending on the context. For example, language and cultural differences may lower productivity. On the other hand, groups of people with diverse perspectives may have an advantage when solving complex problems. Some data suggest that diversity is more likely to produce benefits in highly developed economies than in more basic ones.

Quality of life. The density and intensity of urban life can be good and bad, according to most people’s preferences. On the plus side are richer cultural, entertainment, and shopping opportunities. Downsides include increased crime, traffic, and pollution. Whether the good outweighs the bad, or vice versa, depends on the way a city evolves and on the values each individual assigns to such factors.

Data and Analysis

Using *regression analysis* (a method of exploring the relationships between a set of independent variables when one dependent variable is held steady) and data derived primarily from the U.S. Census, Murdoch attempts to define the relationship between each of these factors (the independent variables) and employment growth in the 379 U.S. Metropolitan Statistical Areas and Metropolitan Divisions (the dependent variable). *Note: Many MSAs include one or more Metropolitan Divisions. Locally, Dallas is part of the Dallas–Plano–*

Irving Metropolitan Division of the larger Dallas–Fort-Worth–Arlington MSA.

The following observations emerged:

- *Size matters*. Larger metro areas tend to grow more slowly than smaller ones. Similarly, areas dominated by a few large firms tend to grow more slowly than ones with many smaller firms.
- *Manufacturing is a drag*. Economies with a high proportion of manufacturing jobs grew more slowly than those based on other economic sectors.
- *Density is a wash*. The benefits of more and better opportunities to consume tend to roughly cancel out the hassles (more crime, longer commutes, and so on).
- *Youth and education rock*. As expected, a more educated population correlates strongly with economic growth. So, too, does a younger population.
- *Diversity is problematic*. Contrary to some past analyses, the data indicate that racial and ethnic diversity correlate with slower growth at the MSA level.

Framing the Dallas Region

To assess how well the Dallas–Plano–Irving Metropolitan Division is positioned to sustain future growth, Murdoch compares Dallas' past and present performance against the 19 other MSAs or Metropolitan Divisions with populations of at least 1.5 million in 1970. On most of the variables described in the previous section, Dallas ranks well within that group.

Population growth. On this measure, which correlates strongly with economic growth, Dallas moved from 20th place in 1970 to 7th in 2005 by U.S. Census estimates.

Structure of the economy. Of the 20 areas studied, those that were most manufacturing-dependent in 1970 fared worst economically between 1970 and 2005. The areas, including Dallas, that began with the smallest manufacturing sectors, grew robustly while also seeing an increase in the share of their economies devoted to manufacturing. Dallas rose from 13th to 10th place in the share of economic production derived from manufacturing measure.

Considering the more comprehensive data showing the negative effect of reliance on manufacturing, it is possible that Dallas' experience so far represents a beneficial maturing of its economy that could eventually be problematic if trends continue.

Age of the population. Among the 20 areas, Dallas ranked second only to Houston in the proportion of the population under age 18.

On *quality-of-life* measures, *wages*, and *housing prices*, the data are inconclusive. Where quality of life is low, economists usually expect to see increased wages and reduced housing prices. In Dallas, however, both remain relatively low compared with peer areas.

On one dimension—*educational attainment*—the data clearly raise a red flag. All 20 areas saw an increase over time in the proportion of residents over 25 who have at least a bachelor's degree. Dallas, however, showed the second smallest gain, resulting in a fall from 4th to 6th place.

While that is a respectable ranking, if the trend continues it may be difficult for Dallas to maintain its exceptional economic growth record. Thus the trend, which is caused in part by the rapid growth of Dallas' foreign-born population, creates a clear and present danger for which there are, unfortunately, few clear solutions.

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ABSTRACT
The Dallas–Plano–Irving Metropolitan Division is one of the largest in the United States. It certainly has the potential to maintain and even improve this ranking over the next couple of decades. The extent to which it will depends on several factors, including educating more of its population at least at the bachelor's level and maintaining a diverse and competitive economy. This paper uses data on 379 Metropolitan Statistical Areas and Divisions to, first, analyze how these factors relate to urban employment growth and, second, to compare the Dallas–Plano–Irving Metropolitan Division with 19 other large metropolitan areas. This exercise shows the potential for economic growth in the Dallas area and highlights the main threats to realizing this potential.

Keywords
economic growth, population change, metropolitan, density, diversity

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Introduction

From 1990 through 2005, the population of the Dallas–Fort Worth–Arlington Metropolitan Statistical Area (MSA) grew almost 46%. Among all 360 MSAs in the United States, the Miami–Fort Lauderdale–Miami Beach MSA grew the most (approximately 156%), while the Weirton–Steubenville, West Virginia–Ohio MSA grew the least (less than *negative* 11%). The Dallas–Fort Worth–Arlington growth rate was among the top 50 (32nd). This may seem unremarkable; however, of the 10 largest MSAs in the United States, only the Atlanta–Sandy Springs–Marietta MSA, with a growth rate of approximately 60%, grew more than Dallas–Fort Worth–Arlington, which raises some important questions. What about the Atlanta and Dallas areas, in comparison with other large MSAs, generates such high rates of population growth? Are these rates sustainable, and what do they mean for various demographic groups? Does local public policy matter, and what are the consequences of such population growth?

In this paper, I have attempted to provide a foundation for addressing these questions in two ways. First, I have considered the determinants of economic growth in cities. Economic growth generally means increasing rates of output per person, but this concept is difficult to measure at the city or metropolitan level. Therefore, the analysis is based on growth in population and employment. The idea is that both employment growth and total population growth signal areas that are growing economically. After all, labor is quite mobile within the United States, and we should expect that people will move to areas that seem to offer the best opportunities for increasing their welfare (see Glaeser et al., 1995; Alesina & La Ferrara, 2005). Second, I have tried to frame the Dallas experience over the past 25 years by comparing it with 19 other large metropolitan areas. The comparison affords insights into how Dallas ranks in terms of the main determinants and correlates of economic growth.

Economic theory is fairly clear on the main explanations for economic growth. Growth depends on the factors of production—usually physical capital, human capital, technology, and raw materials—and the institutional environment. With funding from the World Bank, the National Science Foundation, and various private foundations, the economics profession has mounted a substantial research effort to understand how this theory relates to living conditions measured at the national level (see, for example, Barro & Sala-i-Martin, 2004). We now know, for example, that education (hence, investment in human capital) and institutional environments are roughly as important as investment in physical capital. Moreover, the literature has suggested that, on average, national environments that foster an educated population, democratization, trust, security, and liberty generally foster economic development.

A similar, though not as intensive, effort by urban economists has used data on metropolitan areas in the United States to try to understand some of the main correlates of economic growth at the subnational level (see, for example, Glaeser et al., 1995). The basic growth theory is essentially the same, whether one is interested in nations or regions. Cities are economies that use technology to produce outputs from capital and labor inputs within an institutional environment. Additionally, co-location (i.e., agglomeration or density) in cities generates various "spillovers" or externalities, such as access to specialized accounting services, which cause cities to be more productive. Density also facilitates the production of numerous desirable goods and services, including an array of diverse restaurants, museums, parks, housing options, and recreational opportunities, as well as ideas through human interaction. Likewise, density generates undesirable by-products, such as congestion, pollution, and crime. People act rationally within this framework by moving and harnessing resources in order to make themselves better off.

Most of the summary information about the correlates of economic growth is derived from "growth regressions." The dependent variable is some measure of economic growth, over a period of time, and the independent variables attempt to measure such factors as the initial economic situation, educational level of the population or workforce, investment in physical capital, and the institutional environment. These regressions are rarely able to confirm causation, but they do provide information on the strength of associations between the dependent and independent variables. These associations can be quite informative in that some hypotheses about growth processes can be rejected based on them. The main problem with these models is they are designed to describe the central tendency in the data. While this is useful for understanding the general pattern of economic growth, it is easy to forget where a particular country or region falls in the dataset. In this paper, I am interested in *not* losing track of the Dallas area within the framework of a study of urban areas in the United States; thus, the primary purpose of growth regressions presented in this paper is to highlight the correlates of metropolitan area economic growth. Then, it is easier to examine how the Dallas area compares with other metropolitan areas in the United States.

The analysis of economic growth in an MSA provides insights into the region's economic potential. For example, a place with high crime, bad climate, obsolete or unproductive businesses, and an uneducated workforce will not fare well in competing for resources such as skilled workers and business investment. Regardless of its past growth profile, it will lose out to more attractive places, and economic growth will diminish. Its potential is gauged against the competition—other regions in this example. Thus, this paper frames the economic potential of the Dallas area by comparing it with the characteristics of other MSAs that seem to have been related to economic growth over the past 30 years. The analysis is descriptive in the sense that it exploits associations between measures of urban areas of different sizes, at various geographic scales, and at different time periods.

This paper is organized into five additional sections. Section II contains a brief overview of the literature that seems most relevant for addressing the questions posed above and facilitates the formation of a list of plausible empirical relationships that provide a guide for comparing MSAs. Section III covers the sources of basic data and definitions of variables used to estimate the relationships. Section IV contains an analysis and summary of the findings from the estimation of three growth regressions. Section V relates the estimates from Section IV to the Dallas–Plano–Irving Metropolitan Division. The final section contains brief concluding remarks.

Literature Overview

Size and Diversity

The idea that cities exist because of positive externalities or "external economics of scale" from the co-location of a group of production processes is at least as old as Alfred Marshall. The distinction between internal economies of scale and external economics of scale is important. Internal economies of scale are evident when a firm experiences falling costs per unit as production increases. External economies of scale deal with socially increasing returns (greater productivity) to scale even in the presence of modest-sized firms. With external economies of scale, individual firms can be experiencing internal constant returns to scale, but they are more productive as total output in their region increases. In other words, the local economy becomes more productive as it gets bigger; hence, people can become relatively better off in such environments (i.e., the economy experiences growth).

Quigley (1998) explained that, with growth in city size and diversity, many economies are realized, such as reduced costs when matching labor to jobs, sharing specialized inputs like accountants and attorneys, and consuming public goods like parks and theaters, as well as the benefits of the inherent stability of a diversified economy. The point is that people are better off (have higher income) in such diverse environments.[1] Duranton and Puga (2001), on the other

[1] Cities cannot reap these external economies forever—eventually, diseconomies (negative externalities) associated with congestion, pollution, and so on will offset the external economies. This is discussed below.

hand, suggested that diverse cities foster innovation and the development of new products, but once the new products are developed, firms mass-produce output in specialized (rather than diverse) cities. Duranton and Puga suggested that a system of cities would therefore exhibit some diverse and some specialized cities.

It is not clear if spillovers are stronger in cities with high concentrations of specific industries or in cities that are more diverse. With high concentration (i.e., close to monopoly), spillovers from agglomeration are internalized by firms. Anecdotally, the high concentration of telecom firms in the Dallas area seemed to foster an era of rapid growth in the telecom sector, just as energy concentration in Houston appeared related to growth in that sector. In their seminal paper, Glaeser et al. (1992) contradicted this anecdotal evidence, finding that industries grew faster in cities that were economically diverse; i.e., growth of industry "X" was slower when "X" was concentrated in the city. They noted their findings were consistent with the hypotheses of Jacobs (1969); that is, variety and diversity promote economic growth.

This discussion of external economies has suggested a couple of empirical statements and associations that may appear when comparing metropolitan areas:

1. Larger and denser cities offer more opportunity for externalities, and hence, greater economic growth.
2. There is some reason to believe that more diverse economies will be associated with faster economic growth.

Human Capital

For the past 20 years, economists have taken a renewed interest in economic growth and theories of economic growth. Barro and Sala-i-Martin (2004, p. 19) noted that "growth theory effectively died as an active research field by the 1970s…" but "experienced a boom, beginning with the work of Romer (1986) and Lucas (1988)." Many of the recent empirical applications of the new growth theory (or endogenous growth theory) apply the notion of "dynamic externalities." Dynamic externalities, like external economies of scale, allow for social increasing returns in the presence of private constant returns. One example is "knowledge" that accumulates and then, in aggregate, is available to all firms—hence, augmenting production and increasing growth. The process reenforces itself (hence, is endogenous) over time (hence, is dynamic), and growth continues. The new growth theory has had a significant influence on the way economists study the economies of cities.

Building from Jacobs (1969) and Arrow (1962), Romer (1986) and Lucas (1988) formally modeled the role of knowledge or accumulated human capital in sustaining economic growth. At the city level, knowledge spillovers (dynamic externalities) are clearly one of the most important benefits from co-location to both firms and individuals. Firms invest more in capital to take advantage of human capital concentrations, and the benefits of this investment can improve the welfare of workers with less human capital. Exactly how (and to whom) the benefits spillover is open for debate. The point is that areas with higher concentrations of human capital are more productive and more conducive to economic growth. Moreover, educated workers may attract more educated workers, thereby enhancing the externality (Berry & Glaeser, 2005).

What attracts productive people to geographic areas? Florida (2002a, 2002b, 2002c, 2005) has considered the association between "talent" (eg., highly educated, in professional and technical fields, scientists and engineers) and several diversity measures, including the percentage of the population that is gay, and, for example, the number of bars, clubs, theaters, art galleries, and museums per capita. His argument suggests that regions need to consider their "people climate" as well as their "business climate" to reach higher levels of growth.[2]

This discussion suggests two additional empirical statements:

1. Metropolitan areas with greater levels of human capital experience greater economic growth.
2. Areas that are more attractive to human capital experience greater economic growth, deepening the human capital of the labor force.

Fractionalization

Extending the work of Glaeser, Scheinkman, and Shleifer (1995) and Rappaport (1999), Alesina and La Ferrara (2005) considered the role of "fractionalization" on economic growth. They used data from U.S. counties from 1970 to 2000, but some of their insights are also applicable to metropolitan areas. Fractionalization is a measure of diversity and increases when the population is comprised of individuals of various races and/or ethnicities. They found that for counties that are initially poor, fractionalization hurts growth, but

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[2] There is some debate about the robustness of Florida's associations. For example, in an executive briefing, Weissbourd and Berry (2004) noted they did not find a strong association between percentage of the population with a college education and Florida's measures of diversity. Additionally, Florida stresses technology and tolerance in addition to talent as drivers of economic growth.

for higher income counties, it can be positive.

Alesina and La Ferrara (2005) explained their results by examining the pros and cons of diversity. The cons include oppression of minorities, conflict of preferences, and racism. Diversity can directly enter the utility function—a notion that comes from social identity theory. Individuals attribute positive utility to the utility of the members of their own group and negative utility to the utility of members of other groups. Hence, decisions based on race or ethnicities are "rationalized" in the decision-making process of individuals.

The pros stem from the external benefits of variety in abilities and cultures that enhance productivity. Diversity may enter the production function of a firm because a group of cognitively diverse problem solvers often solve complex problems more easily than homogeneous groups do. It may also be true that diverse groups of people with limited abilities outperform homogeneous groups with more abilities (Alesina & La Ferrara, 2005). However, because there is a tradeoff between the benefits of diversity and the costs in terms of communication and coordination, one can imagine an optimal amount of diversity (or turning point) for a firm and even a region. These external benefits are similar to those proposed by Marshall. On the individual side, this type of diversity can enhance culture and thus be a driver for additional growth, as suggested by Florida (2002a, 2002b, 2002c, 2005).

In terms of additional empirical statements, this discussion suggests a fifth one—that there is a plausible relationship between economic growth in metropolitan areas and fractionalization. The relationship may be negative for relatively poor areas but positive in richer urban areas.

Preferences

The previous discussion focused on ways economies become more or less productive. Various levels of specialization, knowledge spillovers, and labor heterogeneity result in an ordering of metropolitan areas in terms of productivity. All else equal, greater productivity will increase wages and returns to investment, sustaining economic growth. There are natural brakes to this process, however. Pollution, crime, and congestion are often associated with larger cities and diminished quality of life. As these rise, wages also need to rise to compensate workers for diminished quality of life. This is not driven by productivity increases, so firms will not want to continue expanding employment, thus limiting growth. On the other hand, access to professional sports, museums, live performances, and an array of restaurants—which are associated with an area's size—tend to enhance quality of life, suggesting that people may be willing to accept lower wages to live in desirable cities. Preferences for these "bads" and "goods" make it difficult to interpret associations between economic growth and the characteristics of cities. For example, consider the relationship between population (or labor force) growth and density. An area with high density is favorable to productivity enhancements from co-location economies of scale and from knowledge spillovers, but is also conducive to crime and congestion. The observed relationship between growth and density is a *net* effect (Glaeser et al., 1995). If we see no relationship, it may simply mean the positive productivity effects are offset by the negative consumption effects.

Preferences for bads and goods may translate into wages and housing prices. An MSA with high productivity but high crime, for instance, would probably see wages driven higher and housing prices lower. These price effects compensate workers for living in such conditions. However, these effects are often difficult to interpret at the MSA level. The geographic scale is so large that, especially with respect to housing prices, a summary statistic for the entire area may not adequately convey the preferences of individuals in that MSA. Thus, in analyzing these, we must be careful not to give them too much weight.

Data

The unit of analysis is based on the concept of the Metropolitan Statistical Area (MSA) as defined by the Office of Management and Budget (OMB) in 2000. The OMB first announced the list of MSAs used here in 2003. (Note: Since then, they have made some minor modifications.) An MSA must have at least one urban area with more than 50,000 inhabitants. MSAs with populations of more than 2.5 million may be split into smaller areas called Metropolitan Divisions. In this paper, I use Metropolitan Divisions instead of the whole MSAs where they exist. Thus, instead of a single data point for the Dallas–Fort Worth–Arlington MSA, the dataset contains two—one for the Dallas–Plano–Irving Metropolitan Division and one for the Fort Worth–Arlington Metropolitan Division.[3] There are 379 MSA Metropolitan Divisions in the dataset.

Because MSA definitions are based on counties, MSA-level measures can be formed by summing, or adding up, county-level measures. All of the data used here, except the Housing Price Index published at the MSA level by the Federal Deposit Insurance Corporation, were originally county-level observations.[4] For single county MSAs, the county-level data are also the MSA-level data, but for multicounty MSAs, the data are aggregated.

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[3] See U.S. Census (n.d.-a) and U.S. Census (n.d.-b) for the OMB lists and discussion about how the current definitions of MSAs vary from previous concepts.

[4] The implication of this can be seen by looking at the calculation of per capita income in, for instance, a four-county MSA. For each county, collect total income and total population. Add these across the four counties to find total income and population in the MSA, then divide total MSA income by total MSA population.

Population

The population data come from the U.S. Census Bureau. I use the decennial Census figures where applicable, and official estimates after 2000.[5] Variables denoting total population are always denoted by "POPyy," where "yy" represents the last two digits of the year—thus, "POP04" denotes population in year 2004. Other population characteristics are denoted in a similar fashion. These include number of people older than 25 with a bachelor's degree, under 18 years old, between 18 and 49 years old, and number of individuals who are Hispanic, non-Hispanic white, non-Hispanic black, and non-Hispanic Asian and Pacific Islander. The people who do not clearly fall in one of the race/ethnic categories are grouped into a remainder category (see Table 1).

Table 1
Variable Names and Descriptions

POPyy	Total Population in year yy.
GPOPxx_yy	Growth in total population from year xx to year yy.
BACHDGyy	Fraction of the population older than 25 in year yy with a bachelor's degree.
UNDER18_yy	Fraction of the population in year yy under 18 years old.
AGE18_49_yy	Fraction of the population in year yy between the ages of 18 and 49, inclusive.
HISPANICyy	Fraction of the population in year yy that is Hispanic.
NHWHITEyy	Fraction of the population in year yy that is non-Hispanic White.
NHBLACKyy	Fraction of the population in year yy that is non-Hispanic Black.
NHASIANyy	Fraction of the population in year yy that is non-Hispanic Asian or Pacific Islander.
OTHERyy	Fraction of the population in year yy that is non-Hispanic and not White, Black, or Asian Pacific Islander.
FRACyy	Fractionalization in year yy = 1-$HISPANICyy^2$-$NHWHITEyy^2$ -$NHBLACKyy^2$-$NHASIANyy^2$-$OTHERyy^2$.
TOTALEMPyy	Total employment in year yy.
MFGSHAREyy	Share of employment in the manufacturing sector in year yy.
DENSyy	Density in year yy = POPyy/SQMI.
PCIyy	Income per capita in year yy.
EST_SIZEyy	Average size (number of employees) of business establishments in year yy.
TWORKyy	Average travel time (hours) to work in year yy.
MHVyy	Median house value (owner-occupied units) in year yy.

Note. The unit of observation is the MSA or Metropolitan Division

Employment

The employment data are from various years of the U.S. Census' County Business Patterns. Data for 1990 and 2004 were obtained from the U.S. Census (n.d.-e), while data for 1980 and 1969 (referred to as 1970 in the text) are from Inter-university Consortium for Political and Social Research (ICPSR) in 2003. County Business Patterns facilitate the calculation of total employment (represented by TOTALEMPyy), number of establishments (TOTALESTyy), and breakdowns of employment and number of establishments by either Standard Industrial Classification System (SIC) codes (1980 and 1969) or North American Industry Classification System codes (NAICS) (2004). Of primary interest is total employment in manufacturing (SIC codes "20-" and NAICS codes "31-"), referred to as MFGEMPyy.

[5] The 1990 and 2000 Census data are available in various forms from the U.S. Census (n.d.-d). The 1970 Census data are from Geolytics (2001)..

Other Data

County-level information on travel time to work for individuals not working at home came from Geolytics (2001) and the U.S. Census (n.d.-d). Once aggregated to the MSA level, the information can be used to approximate the average travel time to work (represented by TWORKyy) for each MSA.

Similarly, county-level values of owner-occupied housing units for year 2000 are from the U.S. Census (n.d.-d). These were used to estimate the median value of owner-occupied housing (MEDVAL00). For estimates for other years, I used the Housing Price Index (HPIyy) from the Office of Federal Housing Enterprise Oversight (n.d.) to inflate or deflate the year 2000 values. Thus, other than MEDVAL00, MEDVALyy is determined by the index and MEDVAL00. County-level income per capita data are from the Bureau of Economic Analysis (n.d.), and, after aggregation to the MSA level, facilitate the calculation of income per capita (PCIyy) for each MSA.

The variable names and a brief description of the measures used in the remainder of the paper are given in Table 1.

Regression Analysis

In this section, the goal is to highlight the relationships between measures of economic growth in MSAs and various economic, population, and institutional characteristics. Regression facilitates the estimation of “partial effects” in the sense that we can see how one variable is associated with another by holding other influences constant. The dependent variable in the regressions is a measure of growth in total employment. Specifically, I use the growth in the natural logarithm of total employment from 1990 to 2004; that is:

$$[\ln(\text{TOTALEMP04}) - \ln(\text{TOTALEMP90})]/\ln(\text{TOTALEMP90}).$$ [6]

The independent variables are motivated by the discussion and empirical statements given in the previous section. These include the initial size of the economy (the natural logarithm TOTALEMP90), the initial structure of the economy as measured by the share of employment in the manufacturing sector (MFGSHARE90), initial population density (DENS90), initial average travel time to work (TWORK90), the initial fraction of the population with a bachelor’s degree (BACHDG90), the initial fraction of the population under 18 years old (UNDER18_90), and the initial race/ethnic fractionalization (FRAC90).

[6] The qualitative results are mostly the same for growth in TOTALEMP instead of natural logarithm; however, the fit and significance of the partial effects are much better using the natural logs.

Representative regressions are presented in Table 2, while summary statistics are given in Table 3. Table 2 contains three models. Looking at the coefficient estimates on the logarithm of total employment in 1990 (TOTALEMP90), we see that they are always negative and significant.[7] This indicates that, holding other influences constant, larger urban economies tend to grow more slowly than smaller ones. In other words, there is a tendency for urban economies to "converge." However, we do not expect to ever see complete convergence because many MSAs may develop particular economic structures that will either (a) prevent them from ever completely catching up or (b) enable them to maintain relatively high growth rates. Much technology is easily transferable across cities, so smaller cities can take advantage of economies of scale. Certain technologies and environments do not transfer; hence, not every economy will eventually grow at the same rate.

The estimates of the share of employment in manufacturing (MFGSHARE90) are also consistently negative and significant, indicating that urban economies that are historically more manufacturing-based tend to grow more slowly. Expressing this in a slightly different manner, economies with relatively less concentration in manufacturing are probably better able to grow as the overall economy evolves away from manufacturing.

Interestingly, population density (DENS90) is not significant in the regression. As noted, there are both costs and benefits of density. It appears these opposing forces cancel each other. In Model 2, I add a nonlinear term (DENS90-Squared) to test for a turning point in the density effect. This is not significant either, so it seems best to conclude that all else equal, there is no association between density and the conditional average of employment growth. The estimate on average travel time to work (TWORK90) is actually positive and sometimes significant. This was unexpected.

An educated and young population is clearly positively associated with employment growth. Education generates dynamic externalities, so this finding is not unexpected. A younger population signals the existence of attractors that probably also correlate with employment growth.

As Alesina and La Ferrara (2005) found at the county level, fractionalization is negatively related to growth at the MSA level. Unlike the finding in Alesina and La Ferrara, however, Model 2 shows this does not change with higher initial incomes. In fact, the estimates of the interaction between FRAC90 and PCI90 show fractionalization is more negative in initially higher income areas, suggesting the importance of homogeneity actually increases with income per

[7] For discussion, I use the term "significance" to indicate that the absolute value of the t-Statistic for the coefficient estimate is greater than 1.96.

capita. Model 3 adds a measure of firm size to the regression. The negative and significant effect confirms Glaeser et al. (1992)—smaller firms foster competition, and competition generates more external economies and employment growth. The regional dummy variables simply indicate that even after controlling for population characteristics, size, and economic structure, the urban areas of the Northwest and Midwest still display slower rates of employment growth than the South and West (the left-out category). The fractionalization and density measures (FRAC90 and DENS90) are particularly sensitive to the regional dummy variables. In fact, removing the dummies from the specification and reestimating the models gives a negative and significant coefficient on DENS90 and an insignificant coefficient on FRAC90. Less dense and more fractionalized areas with faster employment growth tend to be the South and West, meaning the dummies are picking up some of these effects.

Table 2
MSA/Metropolitan Division Growth Regressions

	Model 1		Model 2		Model 3	
Variable	Coefficient	t-Stat	Coefficient	t-Stat	Coefficient	t-Stat
Log(TOTATEMP90)	-0.005	-6.19	-0.004	-5.33	-0.003	-3.68
MFGSHARE90	-0.048	-7.28	-0.047	-7.20	-0.035	-4.22
DENS90[b]	0.004	0.25	-0.005	-0.13	0.002	0.15
DENS90-Squared			0.050	0.80		
TWORK90	0.026	1.62	0.039	2.32	0.017	1.05
BACHDG90	0.102	5.41	0.122	6.13	0.106	5.61
UNDER18_90	0.124	6.05	0.103	4.82	0.128	6.26
FRAC90	-0.025	-5.13	0.009	0.71	-0.024	-4.93
FRAC90*PCI90[c]			-0.020	-2.72		
EST_SIZE90[a]					-0.855	-2.39
Northwest Region Dummy	-0.017	-7.13	-0.017	-7.25	-0.015	-6.36
Midwest Region Dummy	-0.011	-5.52	-0.011	-5.70	-0.009	-4.13
South Region Dummy	0.001	0.30	-0.0006	-0.36	0.002	0.93
Intercept	0.044	4.62	0.037	3.79	0.039	4.06
R-Squared	0.53		0.54		0.54	
Observations	371		371		371	

Note. The dependent variable is the growth in the natural logarithm of total employment from 1990 – 2004.
N=371
[a]Expressed in 000.
[b]Expressed in 0000.
[c]Expressed in 00000.

Table 3
Brief Variable Descriptions and Summary Statistics for the Variables Used in the Growth Regressions

Variable	Mean	Minimum	Maximum
TOTALEMP90	2.118	0.036	44.580
TOTALEMP04	2.615	0.052	46.088
MFGSHARE90	0.214	0.022	0.575
DENS90	0.029	0.0005	0.603
TWORK90	0.372	0.257	0.636
BACHDG90	0.124	0.0599	0.257
UNDER18_90	0.259	0.155	0.379
FRAC90	0.279	0.029	0.670
PCI90	1.780	0.928	3.430

Framing the Dallas–Plano–Irving MSA Division

The regression analysis extends to 2004 and to the new definitions of MSAs, which, to date, have not been used for similar studies in the economics literature. The estimates presented above confirm the following: (1) All else equal, larger economies will grow more slowly than smaller ones. The hottest MSAs, in terms of population growth from 1990 to 2004, were places such as St. George, UT; Las Vegas, NV; and Bend, OR. Of course, all else is never truly held constant, so it is not likely that Bend, OR, will ever be more populous than the Dallas–Plano–Irving Metropolitan Division. The point is that when looking at the Dallas area, we cannot expect growth rates such as St. George, UT, experienced. (2) The structure of the economy is important. Places with relatively small firms (again, all else equal) that are not concentrated in manufacturing have grown faster since 1990. (3) A young and educated population correlates positively with economic growth. Urban places with success in this dimension appear to also be more successful in terms of growth, either by growing internally through keeping younger people from emigrating and getting them to college or by attracting educated and younger people from elsewhere. (4) Racial and ethnic fractionalization or the lack of homogeneity in the population seems to hurt growth or, at best, not help it. This finding is discouraging for areas such as Dallas that are seeing increases in diversity, primarily through immigration and relatively high birth rates for Hispanics.

In order to understand the current state and prospects for continued growth in the Dallas–Plano–Irving Metropolitan Division, we need to look specifically at how it compares with similarly sized MSAs or Metropolitan Divisions along these various dimensions. I call this type of analysis "framing" because the picture depends on the comparison reference group.

Growth in Population

Generally, employment growth and population growth move together. For example, the Pearson Correlation coefficient between growth in employment from 1990 to 2004 and growth in population from 1990 to 2004 is 0.81. Given this and the fact that historical population data are more readily available, I analyze growth in population to discuss economic growth.

Table 4
Total Population Trends for the Metropolitan Statistical Areas/Metropolitan Divisions With More Than 1.5 Million People in 1970

MSA/Metropolitan Division Name	GPOP70_04	POP1970	POP2004	GPOP00_04	GPOP90_00	DENS1970
Atlanta–Sandy Springs–Marietta	1.603 (1)	1.842 (15)	4.796 (5)	0.13 (1)	0.26 (2)	217 (20)
Dallas–Plano–Irving	1.368 (2)	1.609 (20)	3.810 (8)	0.10 (2)	0.25 (3)	276 (17)
Houston–Baytown–Sugar Land	1.351 (3)	2.202 (11)	5.177 (4)	0.10 (3)	0.43 (1)	240 (19)
Washington–Arlington–Alexandria	0.591 (4)	2.533 (9)	4.030 (6)	0.08 (4)	0.07 (7)	544 (12)
Minneapolis–St. Paul–Bloomington	0.536 (5)	2.027 (13)	3.113 (9)	0.05 (5)	0.08 (5)	318 (16)
Oakland–Fremont–Hayward	0.508 (6)	1.632 (19)	2.460 (14)	0.03 (10)	0.08 (6)	1092 (9)
Los Angeles–Long Beach–Glendale	0.410 (7)	7.032 (2)	9.917 (2)	0.04 (6)	0.06 (8)	1721 (5)
Warren–Farmington Hills–Troy	0.403 (8)	1.765 (16)	2.476 (13)	0.04 (8)	0.14 (4)	525 (13)
Baltimore–Towson	0.266 (9)	2.089 (12)	2.645 (12)	0.04 (7)	0.05 (9)	793 (11)
Cincinnati–Middletown	0.217 (10)	1.690 (17)	2.057 (18)	0.02 (13)	0.04 (10)	378 (15)
Chicago–Naperville–Joliet	0.168 (11)	6.721 (3)	7.851 (3)	0.03 (9)	0.01 (12)	1440 (7)
Nassau–Suffolk	0.102 (12)	2.553 (7)	2.812 (10)	0.02 (14)	0.02 (11)	2128 (3)
St. Louis	0.095 (13)	2.551 (8)	2.792 (11)	0.03 (11)	-0.01 (14)	266 (18)
Boston–Quincy	0.080 (14)	1.674 (18)	1.808 (20)	-0.00 (17)	-0.01 (13)	1442 (6)
Newark–Union	0.066 (15)	2.016 (14)	2.149 (16)	0.02 (12)	-0.02 (15)	894 (10)
New York–Wayne–White Plains	0.042 (16)	11.044 (1)	11.506 (1)	0.02 (15)	-0.08 (19)	6416 (1)
Philadelphia	0.004 (17)	3.866 (4)	3.882 (7)	0.01 (16)	-0.05 (17)	1755 (4)
Cleveland–Elyria–Mentor	-0.081 (18)	2.321 (10)	2.134 (17)	-0.01 (18)	-0.06 (18)	1151 (8)
Pittsburgh	-0.131 (19)	2.759 (5)	2.398 (15)	-0.01 (19)	-0.04 (16)	516 (14)
Detroit–Livonia–Dearborn	-0.245 (20)	2.667 (6)	2.014 (19)	-0.02 (20)	-0.12 (20)	4321 (2)

Note. Ranks (from highest to lowest) are in parentheses. The population figures are expressed in millions.

Table 4 contains some basic information on population and density for all MSAs and Metropolitan Divisions that had more than 1.5 million people in 1970. Note that of the 20 areas listed, 11 are divisions of MSAs.[8] The reason for using 1970 as the base year is simply to put the growth experience of these metropolitan areas into a longer time horizon.

There are several reasons for selecting these areas. First, looking at a subset of metropolitan areas makes it easier to describe the Dallas area in comparison with others. Second, the areas with the largest population growth rates tend to be the smaller areas in 1970, so by limiting the description to the larger areas, the comparisons are closer to the "apples to apples" type. Third, the list is geographically representative, and fourth, it contains many of the most popular metropolitan areas in terms of anecdotal stories about urban growth and decline.

The list of MSAs/Metropolitan Divisions in Table 4 is ordered by the rate of growth in population from 1970 to 2004; that is, the Atlanta area MSA is listed first because it had the greatest change in population (approximately 160%), followed by the Dallas–Plano–Irving Metropolitan Division (137%), the Houston MSA (135%), and so on.[9] The other columns illustrate several aspects of the development of the Dallas–Plano–Irving Metropolitan Division. In 1970, the Dallas–Plano–Irving Metropolitan Division had 1.6 million people and ranked 20th (last) in this group in terms of population size. By 2004, it had ascended to 8th place, and by 2005 (not displayed), the U.S. Census estimated that the Dallas–Plano–Irving Metropolitan Division had replaced the Philadelphia MSA Division as the 7th most populated of this group.[10] To make such a move up the rankings, the Dallas–Plano–Irving Metropolitan Division grew rapidly during the 1990s and into the 2000s. Looking at the growth in the 1990s (GPOP90_00 column), it is evident that the southern areas (the first three areas listed) experienced a vastly different growth profile than the other 17 areas. However, by the 2000 to 2004 period, several of the areas that had experienced population declines during the 1990s showed positive rates of growth.

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[8] Three are divisions of the New York–Northern New Jersey–Long Island, NY–NJ–PA Metropolitan Statistical Area (Nassau–Suffolk, Newark–Union, and New York–Wayne–White Plains), while Dallas–Plano–Irving is from the Dallas–Fort Worth–Arlington MSA. Washington–Arlington–Alexandria is from the MSA of the same name. Oakland–Fremont–Hayward is a division of the San Francisco–Oakland–Fremont MSA. Los Angeles–Long Beach–Glendale is a division of the Los Angeles–Long Beach–Santa Ana MSA. The Warren–Farmington Hills–Troy, MI Metropolitan Division is from the Detroit–Warren–Livonia MSA. Chicago–Naperville–Joliet is from the Chicago–Naperville–Joliet MSA. Boston–Quincy is a division of the Boston–Cambridge–Quincy MSA. Philadelphia is a division of the Philadelphia–Camden–Wilmington MSA and the Detroit–Livonia–Dearborn MSA.

[9] The calculation for the Atlanta MSA, for example, is based on the POP1970 and POP2004 given in Table 1; thus, (4.796-1.842)/1.842.

[10] See U.S. Census (n.d.-c).

As previously noted, there are many correlative factors to population growth, which can be noted in the trends discussed above. The role of density, however, was not clear—the density measure was in fact insignificant in the employment growth regressions. The last column of Table 4 contains the people per square mile in 1970. One clear pattern is that the areas with higher population growth rates are also the ones with the least density. This, of course, is partially due to the relatively small populations of the fastest growing areas. However, the population ranks in 1970 do not "fit" the growth pattern as well as density. The correlation between the rank of POP70 and rank of the population growth from 1970 to 2004 (GPOP70_04) is -0.48, while the correlation between the rank of GPOP70_04 and the rank of DENS70 is -0.62.

Even with the substantial growth in total population from 1970 to 2004, the Dallas–Plano–Irving Metropolitan Division remains relatively sparse. In 2004, the population per square mile was 655, or 14th out of the 20 areas listed. Thus, to the extent that density may eventually limit growth in larger MSAs, there still seems to be room for a lot more people.

Table 5 shows the contribution to population growth from international migration and from internal (within the United States) migration. Focusing on the Dallas–Plano–Irving Metropolitan Division, we see that from 2000 to 2004, about 40% of the growth was accounted for by international migration. That is, the total growth rate of 10.4% would have been 6.31% without international migration. The situation is similar in Houston–Baytown–Sugar Land, confirming that Texas is indeed a gateway for international migration (Singer, 2005). Internal migration in Dallas–Plano–Irving made little difference during this period.[11]

Across the MSAs and Metropolitan Divisions in Table 5, we see striking dissimilarities when comparing them with Dallas–Plano–Irving. The Atlanta–Sandy Springs–Marietta MSA is the only one where internal migration made a substantial positive contribution to population growth. Most show substantial out-migration (away from the area) during this period. The New York–Wayne–White Plains area has the highest ranking for growth from international migration and the lowest ranking for internal migration. In fact, the large growth due to international in-migration population was more than offset by the loss (out-migration) to other regions in the United States. This pattern, although not as stark, is repeated in the majority of the areas listed in the table.

[11] The other 60% is accounted for by births and deaths as well as by "residual" in the estimates. See Census (n.d.-c).

Table 5

The Impact of International and Internal Migration on Population Growth from 2000-2004 in the Metropolitan Statistical Areas/Metropolitan Divisions With More Than 1.5 Million People in 1970

MSA/Metropolitan Division Name	GPOP00_04 (%)	GPOP00_04 Without International Migration (%)	Difference (%)	GPOP00_04 Without Internal Migration (%)	Difference (%)
Atlanta–Sandy Springs–Marietta	12.91 (1)	10.24 (1)	2.67 (10)	10.02 (1)	2.89 (1)
Dallas–Plano–Irving	10.40 (2)	6.31 (2)	4.10 (3)	9.86 (2)	0.54 (3)
Houston–Baytown–Sugar Land	9.78 (3)	6.27 (3)	3.51 (5)	8.70 (3)	1.09 (2)
Washington–Arlington–Alexandria	7.81 (4)	4.75 (4)	3.06 (6)	7.92 (6)	-0.12 (6)
Minneapolis–St. Paul–Bloomington	4.85 (5)	3.31 (5)	1.54 (11)	5.28 (9)	-0.42 (7)
Oakland–Fremont–Hayward	2.81 (10)	-0.72 (15)	3.53 (4)	6.90 (7)	-4.09 (17)
Los Angeles–Long Beach–Glendale	4.18 (6)	0.00 (12)	4.18 (2)	8.22 (5)	-4.04 (16)
Warren–Farmington Hills–Troy	3.53 (8)	2.23 (7)	1.30 (13)	3.42 (14)	0.10 (4)
Baltimore–Towson	3.59 (7)	2.77 (6)	0.83 (16)	3.56 (12)	0.03 (5)
Cincinnati–Middletown	2.35 (13)	1.80 (9)	0.55 (19)	2.89 (17)	-0.54 (9)
Chicago–Naperville–Joliet	2.92 (9)	0.03 (11)	2.89 (7)	6.36 (8)	-3.44 (15)
Nassau–Suffolk	2.12 (14)	0.67 (10)	1.45 (12)	3.48 (13)	-1.36 (11)
St. Louis	2.60 (11)	1.96 (8)	0.64 (18)	3.08 (15)	-0.48 (8)
Boston–Quincy	-0.28 (17)	-2.96 (19)	2.68 (9)	4.75 (11)	-5.03 (18)
Newark–Union	2.38 (12)	-0.41 (14)	2.79 (8)	5.18 (10)	-2.80 (14)
New York–Wayne–White Plains	1.85 (15)	-2.81 (18)	4.66 (1)	8.61 (4)	-6.76 (20)
Philadelphia	0.85 (16)	-0.30 (13)	1.14 (15)	2.50 (18)	-1.65 (12)
Cleveland–Elyria–Mentor	-0.67 (18)	-1.38 (16)	0.72 (17)	1.76 (19)	-2.43 (13)
Pittsburgh	-1.37 (19)	-1.79 (17)	0.42 (20)	-0.35 (20)	-1.03 (10)
Detroit–Livonia–Dearborn	-2.30 (20)	-3.56 (20)	1.26 (14)	3.05 (16)	-5.35 (19)

Note. Ranks (from highest to lowest) are in parentheses.

Structure of the Economy

Table 6 shows two measures of the structure of the economies of the 20 MSAs or Metropolitan Divisions with populations greater than 1.5 million in 1970. Both measures are based on the role of manufacturing in the economy. The first illustrates the declining importance of manufacturing in terms of employing U.S. workers. All MSAs or Metropolitan Divisions show a dramatic decrease in the share of manufacturing since 1980. More interesting, however, is that the basic distribution of these shares has changed. The tails of the distribution are similar—the ones with the greatest shares (Detroit–Livonia–Dearborn and Cleveland–Elyria–Mentor) in 1980 tend to be the ones with the greatest in 2004, and the ones with the lowest shares (Washington–Arlington–Alexandria and Boston–Quincy) tend to still have the lowest. But, within these tails, many of the least manufacturing-intensive MSAs or Metropolitan Divisions have actually become, relatively, more manufacturing intensive. Houston–Baytown–Sugar Land, for example, was ranked 18th in 1980 but was 13th in 2004. Similarly, Oakland–Fremont–Hayward went from 16th to 11th, and Dallas–Plano–Irving went from 13th to 10th. In the other direction, Newark–Union went from 3rd to 9th.[12]

The second set of measures in Table 6 shows the average size, in terms of employees, of manufacturing establishments. Once again, every MSA or Metropolitan Division exhibits a declining average size—consistent with the discussion above. However, unlike the share measures, there are only a couple of significant position changes in the size measures. Dallas–Plano–Irving displays one of the largest shifts, from 10th to 3rd in terms of average size of manufacturing firms. The Pittsburg MSA went from 1st to 11th.[13] The trend toward relatively larger manufacturing firms in Dallas–Plano–Irving and relatively smaller manufacturing firms in Pittsburgh is an interesting pattern for these two areas. To some extent, the Dallas area has matured into a manufacturing base, while Pittsburgh has had to re-invent itself. Within this set, there seems to be some evidence that the development of a manufacturing base has corresponded with relatively high rates of economic growth in places like Dallas–Plano–Irving and Houston–Baytown–Sugar Land. A manufacturing base is probably a good thing, but too much of it limits economic potential. Moreover, statistical evidence indicates larger firm sizes correlate with lower rates of growth as competition within the region declines.

[12] Even with these position changes, the rank correlation statistic between 1980 and 2004 manufacturing shares is 0.84.

[13] The rank correlation statistic for average size between the 1980 and 2004 ranks is 0.81.

Table 6
Measures of the Size Manufacturing in the Metropolitan Statistical Areas/Metropolitan Divisions With More Than 1.5 Million People in 1970

MSA/Metropolitan Division Name	Manufacturing Share of Employment			Average Number of Employees in MFG Establishments		
	1980	1990	2004	1980	1990	2004
Atlanta–Sandy Springs–Marietta	0.222 (17)	0.156 (14)	0.08 (16)	64.10 (12)	49.760 (8)	38.43 (7)
Dallas–Plano–Irving	0.245 (13)	0.177 (10)	0.10 (10)	65.79 (10)	51.722 (6)	44.91 (3)
Houston–Baytown–Sugar Land	0.198 (18)	0.131 (18)	0.10 (13)	64.20 (11)	39.590 (16)	36.60 (10)
Washington–Arlington–Alexandria	0.081 (20)	0.063 (20)	0.02 (20)	38.23 (19)	34.408 (18)	25.54 (18)
Minneapolis–St. Paul–Bloomington	0.273 (11)	0.210 (7)	0.12 (6)	72.17 (6)	52.730 (5)	38.43 (6)
Oakland–Fremont–Hayward	0.224 (16)	0.148 (15)	0.10 (11)	48.93 (17)	33.984 (19)	33.48 (14)
Los Angeles–Long Beach–Glendale	0.303 (7)	0.228 (5)	0.13 (5)	52.12 (16)	44.574 (14)	31.02 (16)
Warren–Farmington Hills–Troy	0.331 (4)	0.239 (3)	0.14 (3)	55.10 (14)	44.689 (13)	35.31 (12)
Baltimore–Towson	0.246 (12)	0.144 (16)	0.07 (17)	90.07 (4)	57.431 (4)	38.85 (5)
Cincinnati–Middletown	0.326 (5)	0.229 (4)	0.14 (4)	90.77 (3)	66.668 (2)	48.82 (2)
Chicago–Naperville–Joliet	0.303 (6)	0.206 (8)	0.12 (7)	67.91 (9)	49.364 (9)	37.00 (9)
Nassau–Suffolk	0.237 (14)	0.161 (12)	0.08 (15)	41.92 (18)	34.547 (17)	25.22 (19)
St. Louis	0.277 (10)	0.211 (6)	0.11 (8)	81.21 (5)	64.504 (3)	42.95 (4)
Boston–Quincy	0.184 (19)	0.112 (19)	0.05 (18)	54.77 (15)	41.342 (15)	29.34 (17)
Newark–Union	0.332 (3)	0.202 (9)	0.10 (9)	61.64 (13)	45.083 (12)	34.74 (13)
New York–Wayne–White Plains	0.228 (15)	0.140 (17)	0.05 (19)	37.86 (20)	31.771 (20)	19.59 (20)
Philadelphia	0.281 (9)	0.177 (11)	0.08 (14)	68.99 (8)	49.290 (10)	33.48 (15)
Cleveland–Elyria–Mentor	0.355 (2)	0.251 (2)	0.16 (1)	70.84 (7)	50.290 (7)	37.33 (8)
Pittsburgh	0.303 (8)	0.157 (13)	0.10 (12)	100.56 (1)	47.509 (11)	36.16 (11)
Detroit–Livonia–Dearborn	0.376 (1)	0.268 (1)	0.15 (2)	98.54 (2)	76.919 (1)	54.31 (1)

Note. Ranks (from highest to lowest) are in parentheses.

Education and Age

Information on the proportion of the population older than 25 with a bachelor's degree is given in the left half of Table 7. The Dallas–Plano–Irving Metropolitan Division had a relatively high fraction in 1990 compared with the other areas with more than 1.5 million people in 1970. In fact, only three (Washington–Arlington–Alexandria, Minneapolis–St. Paul–Bloomington, and Oakland–Fremont–Hayward) had a greater percentage. As we know, this is a powerful correlate with economic growth. During the 1990s, however, Dallas–Plano–Irving lost ground. Its percentage increase in this dimension was next to last—only Houston–Baytown–Sugar Land added fewer people in percentage terms. Moving ahead of Dallas–Plano–Irving was Boston–Quincy and Atlanta–Sandy Springs–Marietta. This is a disturbing recent trend and one that does not bode well for future economic growth.

It is difficult to actually design policy to reverse such trends. The Texas Higher Education Coordinating Board (THECB) has recognized the acute need for more Texas citizens to attend college (see THECB, n.d.). The broad policy options will focus on either growing more college-educated citizens internally or attracting them from other areas. One issue with growing them internally is simply the quality of higher education in Texas. For example, using data from TheCenter at the University of Florida (n.d.), I calculated the year 2000 total university research expenditures for the MSAs or Metropolitan Divisions in the database. Expressing these in per capita terms and comparing them with the other 19 MSAs under consideration in this section, I find that the Dallas–Plano–Irving area ranked 16th out of 20. Houston–Baytown–Sugar Land was 9th, while Baltimore–Towson and Oakland–Fremont–Hayward were 1st and 2nd, respectively.[14]

The right half of Table 7 displays similar data for the percentage of the population under 18. Dallas–Plano–Irving fares well in this comparison group, outranked only by Houston–Baytown–Sugar Land. As seen in the regression analysis, this is a positive correlate with economic growth. When examined along with the educational attainment data, we see enormous potential in Texas' largest metropolitan areas. They will have markedly positive population trends if these young people can be college educated and persuaded to remain in Texas.

[14] The data include research spending at medical schools.

Table 7
Recent Trends in the Population Older Than 25 With a Bachelor's Degree and in the Population Under 18 Years Old for the Metropolitan Statistical Areas/Metropolitan Divisions With More Than 1.5 Million People in 1970

MSA/Metropolitan Division Name	Bachelor's Degree			Under 18 Years Old		
	1990	2000	% Change	1990	2000	% Change
Atlanta–Sandy Springs–Marietta	0.18 (6)	0.21 (5)	20.19 (10)	0.26 (8)	0.27 (7)	1.99 (13)
Dallas–Plano–Irving	0.19 (4)	0.21 (6)	8.68 (19)	0.27 (2)	0.28 (2)	3.08 (12)
Houston–Baytown–Sugar Land	0.16 (8)	0.18 (11)	6.81 (20)	0.29 (1)	0.29 (1)	0.35 (18)
Washington–Arlington–Alexandria	0.21 (1)	0.23 (2)	10.88 (17)	0.24 (16)	0.25 (17)	6.61 (3)
Minneapolis–St. Paul–Bloomington	0.19 (2)	0.23 (1)	21.01 (8)	0.26 (5)	0.27 (5)	1.30 (14)
Oakland–Fremont–Hayward	0.19 (3)	0.22 (3)	15.03 (15)	0.24 (12)	0.25 (13)	4.30 (9)
Los Angeles–Long Beach–Glendale	0.14 (11)	0.16 (16)	10.21 (18)	0.26 (7)	0.28 (4)	6.59 (4)
Warren–Farmington Hills–Troy	0.14 (14)	0.18 (10)	25.29 (3)	0.25 (10)	0.25 (15)	0.53 (17)
Baltimore–Towson	0.14 (15)	0.17 (13)	23.97 (5)	0.24 (13)	0.25 (14)	4.56 (8)
Cincinnati–Middletown	0.13 (17)	0.16 (15)	27.22 (1)	0.27 (4)	0.26 (8)	-1.34 (20)
Chicago–Naperville–Joliet	0.15 (9)	0.19 (8)	20.34 (9)	0.26 (9)	0.27 (6)	3.24 (11)
Nassau–Suffolk	0.15 (10)	0.18 (9)	17.78 (14)	0.23 (17)	0.25 (11)	9.00 (1)
St. Louis	0.13 (16)	0.16 (17)	19.46 (12)	0.26 (6)	0.26 (9)	-0.33 (19)
Boston–Quincy	0.18 (5)	0.21 (4)	18.88 (13)	0.22 (20)	0.23 (19)	6.44 (5)
Newark–Union	0.17 (7)	0.20 (7)	14.32 (16)	0.24 (15)	0.26 (10)	8.13 (2)
New York–Wayne–White Plains	0.14 (13)	0.17 (14)	19.93 (11)	0.23 (18)	0.24 (18)	6.21 (6)
Philadelphia	0.14 (12)	0.17 (12)	21.59 (7)	0.24 (14)	0.25 (16)	5.02 (7)
Cleveland–Elyria–Mentor	0.12 (18)	0.15 (18)	23.41 (6)	0.25 (11)	0.25 (12)	1.25 (15)
Pittsburgh	0.12 (19)	0.15 (19)	26.79 (2)	0.22 (19)	0.22 (20)	0.71 (16)
Detroit–Livonia–Dearborn	0.09 (20)	0.11 (20)	24.35 (4)	0.27 (3)	0.28 (3)	3.54 (10)

Note. Ranks (from highest to lowest) are in parentheses.

Per Capita Income and Housing Values

Both wages and housing prices adjust to compensate workers for local conditions. For example, if we compared two places identical in every respect except that one (call it area B) was less safe, we would expect the wages to be greater and housing prices to be lower in area B. These price adjustments do not necessarily correlate with population growth. Both areas could have high rates of growth and similar economic structures. However, the price adjustments may signal differences in urban areas that could eventually influence economic growth. Crime and air pollution may eventually deter college-educated people from locating in an area, for example, thereby gradually reducing the pool of skilled labor.

In Table 8, trends in income per capita and median housing values are presented for the 20 MSAs or Metropolitan Divisions. The growth rate in per capita income and median housing values are both relatively low for the Dallas–Plano–Irving area. Boston–Quincy had the greatest increase in per capita income while Nassau–Suffolk ranked 1st in median house values. The small increase in income per capita in Dallas–Plano–Irving is consistent with workers taking "compensation" to live here, while the small increase in housing values is more consistent with low demand for living in the area. It is also possible that labor productivity is simply lower, hence lower wages, and land is relatively abundant (more elastic supply), hence lower house values. Certainly, the relatively low density of the area seems consistent with the relatively low costs of land. Moreover, that international immigrants find the Dallas area relatively attractive is probably influencing both the labor and housing markets.

Table 8
Trends in Per Capita Income and Median House Values for Metropolitan Statistical Areas/Metropolitan Divisions With More Than 1.5 Million People in 1970

	Per Capita Income (PCI)			Median Housing Value (MHV)		
MSA/Metropolitan Division Name	PCI80	PCI04	% Change PCI	MHV80	MHV04	% Change MHV
Atlanta–Sandy Springs–Marietta	10056 (20)	33838 (18)	236.51 (12)	45.79 (12)	138.30 (12)	202.03 (14)
Dallas–Plano–Irving	11728 (11)	37331 (11)	218.29 (15)	57.27 (5)	112.10 (14)	95.75 (19)
Houston–Baytown–Sugar Land	12217 (4)	36852 (13)	201.64 (17)	52.30 (8)	90.37 (20)	72.80 (20)
Washington–Arlington–Alexandria	11885 (7)	41685 (7)	250.74 (7)	57.28 (4)	215.91 (7)	276.95 (7)
Minneapolis–St. Paul–Bloomington	11769 (10)	40916 (8)	247.65 (8)	48.77 (10)	162.13 (11)	232.43 (11)
Oakland–Fremont–Hayward	12702 (2)	43087 (4)	239.21 (11)	74.33 (2)	346.37 (1)	365.96 (4)
Los Angeles–Long Beach–Glendale	12073 (6)	33179 (19)	174.82 (20)	75.72 (1)	307.41 (3)	305.99 (6)
Warren–Farmington Hills–Troy	12395 (3)	42055 (6)	239.30 (10)	52.74 (6)	163.84 (9)	210.63 (13)
Baltimore–Towson	11020 (13)	38812 (10)	252.20 (6)	47.09 (11)	163.29 (10)	246.76 (9)
Cincinnati–Middletown	10110 (19)	34368 (16)	239.94 (9)	45.40 (13)	111.57 (15)	145.72 (17)
Chicago–Naperville–Joliet	11883 (8)	37081 (12)	212.05 (16)	52.73 (7)	180.39 (8)	242.10 (10)
Nassau–Suffolk	12831 (1)	46023 (2)	258.69 (4)	40.57 (17)	309.80 (2)	663.54 (1)
St. Louis	10455 (18)	34647 (15)	231.40 (13)	40.82 (16)	107.86 (17)	164.24 (15)
Boston–Quincy	10898 (15)	46087 (1)	322.88 (1)	43.29 (15)	296.65 (4)	585.32 (2)
Newark–Union	12165 (5)	45972 (3)	277.90 (2)	60.87 (3)	278.67 (6)	357.85 (5)
New York–Wayne–White Plains	11825 (9)	42274 (5)	257.50 (5)	51.93 (9)	286.55 (5)	451.83 (3)
Philadelphia	10946 (14)	39886 (9)	264.39 (3)	36.21 (19)	134.58 (13)	271.66 (8)
Cleveland–Elyria–Mentor	11401 (12)	34263 (17)	200.53 (18)	43.90 (14)	111.49 (16)	153.97 (16)
Pittsburgh	10557 (17)	34685 (14)	228.56 (14)	38.19 (18)	92.67 (19)	142.64 (18)
Detroit–Livonia–Dearborn	10578 (16)	30006 (20)	183.66 (19)	32.27 (20)	103.05 (18)	219.33 (12)

Note. Ranks (from highest to lowest) are in parentheses.

Conclusion

The Dallas–Plano–Irving Metropolitan Division is one of the largest in the United States. As such, it will not grow as quickly as smaller areas like Bend, Oregon, and St. George, Utah. It may well outperform most of the larger MSAs or Metropolitan Divisions, however. International immigration is strong, accounting for a substantial amount of recent growth and the relatively young age of the population; the population is reasonably well educated; the economy has a manufacturing base that is not so large that it has been a drag on the economy; and there is plenty of geographic space relative to population size. However, the area faces significant challenges as well—challenges that, unmet, will likely swamp the positive trends and significantly impact economic potential. Foremost is the trend in educational attainment. The Dallas–Plano–Irving Metropolitan Division cannot lose its advantage in providing an educated workforce. The obvious critical issue is how to quickly integrate immigrants into the higher education system. Second, the relative increases in share of employment in manufacturing and average firm size, while of no real concern yet, signal structural changes in the local economy. Moving too far in this direction will likely impede economic potential. Maintaining a diverse and competitive structural environment is critical for fostering the innovation, entrepreneurial ventures, and knowledge externalities that will enable the Dallas–Plano–Irving Metropolitan Division to capitalize on its positive position in relation to other large MSAs or Metropolitan Divisions.

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