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CENTRAL CITY DECLINE: REGIONAL OR NEIGHBORHOOD SOLUTIONS?

Richard Voith

The decline of a central city often has economic and social implications for an entire region. But where does the solution lie? Are regional approaches to problems concentrated in central cities warranted? Or should we seek local solutions by transforming cities into a group of smaller, more autonomous communities? Dick Voith looks at some of the issues involved in these questions and suggests that the regional benefits of improving a central city's economy are large.

DOES MONETARY POLICY HAVE DIFFERENTIAL REGIONAL EFFECTS?

Gerald A. Carlino and Robert H. DeFina

Do monetary policy actions have a uniform national effect? Or do the separate, but interdependent, regions of the country respond differently to changes in policy? In this article, Jerry Carlino and Bob DeFina demonstrate that monetary policy does have differential effects across regions. They also examine three reasons why the effects may differ: regional differences in the mix of interest-sensitive industries, in the ability of banks to alter their balance sheets, and in the mix of large and small borrowers.

Central City Decline: Regional or Neighborhood Solutions?

*Richard Voith**

Local control holds a powerful appeal for many Americans. Residents of small suburban jurisdictions point with pride to their high-quality schools and relatively low taxes. The scale and role of local government, however, have changed over time. During the first half of this century, the central city government, by virtue of its overwhelming share of the region's population, was effectively a local and a re-

gional government. In the second half of the century, rapid suburban growth dramatically increased the importance of smaller scale, local suburban governments while economic and social problems became increasingly concentrated in central cities. As we approach the end of the 20th century, the diverging economic paths of cities and suburbs suggest the need to reexamine the appropriate roles of suburban, city, and regional governments. Are regional approaches to problems concentrated in central cities warranted? Or should we seek local solutions by transforming cities into a group of smaller, more autonomous communities?

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CAN WE SUSTAIN THE CURRENT SYSTEM OF LOCAL GOVERNMENT?

In recent decades, most city governments have confronted the problems of declining population and declining relative incomes of city residents. Increasingly, American cities have become wards for the poor, while middle and upper income Americans have chosen to live in the suburbs.¹ The increasing concentration of poverty in central cities creates fiscal problems for central city governments. As the concentration of poverty increases, the tax base for providing basic services such as public safety, sanitation, and education shrinks. At the same time, the costs per capita of providing basic services are higher when the recipient population is poor (see the article by Janet Pack). To provide uniform levels of basic services, city governments tax middle and upper income residents at high rates, implicitly redistributing income from more wealthy city residents to poorer ones.²

Tax revenues used for redistributive purposes are, at least in part, "capitalized" into city property values. Economic theory predicts that the costs of redistributive taxation

are partially offset by lower land prices, which reduce the incentive to move out of the city to avoid taxes. As long as the taxes do not exhaust a city's intrinsic comparative advantages, lower land prices restore equilibrium, although fewer people and firms choose city locations. In recent years, however, technological changes have eroded the economic advantages of cities and have, therefore, reduced their ability to pursue redistributive policies. And as residents with higher incomes leave the city, providing the same level of government services requires even higher tax rates, which in turn induces more people to leave the city. Thus, while cities have some latitude for income redistribution, it is not without negative consequences, and the level of redistribution that cities can sustain in the long run has greatly diminished.³

Charles Tiebout first analyzed the consequences of voting with one's feet. In Tiebout's world, people move to communities that have tax and expenditure policies that best suit their preferences. Tiebout argued that competition among small jurisdictions would lead to a system of homogeneous communities that efficiently provide the desired public services.⁴ Because Tiebout's communities are homogeneous, local income redistribution is irrelevant.

¹Nationally, the percentage of city residents with incomes below the poverty line increased from 14.9 percent in 1970 to 18 percent in 1990. However, the percentage of people in poverty in suburbs was 8.1 percent in 1970 and in 1990 (*Census of Population*, June 1972, Table 17; April 1973, Table 90; and November 1993, Table 3). In the Philadelphia metropolitan area, 15.4 percent of Philadelphia's population in 1970 had incomes below the poverty line; this figure increased to 20.3 percent by 1990. In the Philadelphia suburbs, the poverty rate fell from 6.4 percent in 1970 to 5.6 percent in 1990.

²Jere Behrman and Steven Craig note that cities do not always provide uniform services across neighborhoods, perhaps recognizing that some communities will not accept standards of service below a certain level, given their tax rates. Still, as the level of poverty increases, there is more political pressure for policies that explicitly redistribute income from the relatively wealthy to the poor.

³Robert Inman found that tax rates in the city of Philadelphia were generating near their maximum revenue. In other words, a tax increase would induce so many residents to leave the city that no net new revenue would be generated.

⁴Most economic analyses of the appropriate size of local jurisdictions have focused on the tradeoff between the benefits of policies that closely match the desires of the residents and potential economies of scale in the production of public goods that may be available in larger communities. Studies of public service production find that economies of scale for most services are exhausted at communities of 50,000 or less, suggesting that communities do not have to be larger to be efficient providers of public goods (see the article by Bryan Ellickson).

Suburbs, which frequently have a large number of small municipal jurisdictions, approximate the Tiebout model and, hence, avoid the local income redistribution conundrum confronting cities. Large cities, on the other hand, do not fit well into the Tiebout framework. Formed prior to the technological changes and public investments in transportation that made suburban alternatives attractive, cities provided public services to and imposed taxes on a population with diverse preferences and incomes. With little competition from other local jurisdictions, cities were able to spread the burden of poverty broadly across the population.⁵ Redistribution was sustainable because the cost of avoiding local taxes was very high; one had to leave the metropolitan area to change one's tax and service bundle. However, with the opening of the suburbs, city residents had alternatives through which they could avoid the costs of their neighbors' poverty. Tiebout's observation that people vote with their feet implies that any city policy that implicitly or explicitly redistributes income has negative consequences for the city, as net contributors depart to join more homogeneous suburban communities.

The success of suburbs and the relative failure of central cities have tended to reinforce Tiebout's speculations about the benefits of smaller jurisdictions. But the Tiebout model, which suggests that competition among small communities will lead to efficient production and delivery of public services, depends on the assumption that communities are completely independent of one another. However, accumulating evidence indicates that there are substantial spillover effects from one community to another.

⁵The lack of jurisdictional competition also reduces the incentives for efficient government. Government inefficiency can be viewed as a kind of income transfer in which funds are diverted from taxpayers to individuals working for the government.

My recent research, as well as research by Charles Adams and associates and by Henry Savitch, offers evidence that central city decline has adverse effects on its suburbs.⁶ My 1994 study, for example, found that increases in the growth rate of incomes of central city residents had a positive impact on the growth rate of incomes of suburban residents and on the appreciation of house prices in the suburbs. Adams and associates found that central city problems adversely affected the rate of suburban population growth because fewer people are willing to move into the region's suburbs from other regions. Negative factors associated with central city decline suggest that cities and suburbs have common interests.

REGIONAL APPROACHES TO CENTRAL CITY DECLINE

If city decline adversely affects the overall economic health of a metropolitan area, both city and suburban residents alike have a stake in the economy of the city. In theory, if central city decline is not being driven exclusively by basic economic forces, but rather by public policy choices and costs associated with poverty, cooperative actions by cities and suburbs to provide public services more efficiently and to share resources to finance the burden of poverty can be mutually beneficial.⁷ The key element in any regional approach is that costs and benefits are shared across jurisdictions. There are many forms of regionalization, including regional governments, regional tax

⁶Keith Ihlanfeldt presents a critical analysis of the literature on the interdependence of cities and suburbs.

⁷See Peter Mieszkowski and Edwin Mills for a discussion of the roles of basic economic factors, public policies, and urban problems in the process of metropolitan decentralization. Most economists would agree that we should not attempt to reverse central city decline caused by underlying changes in technology and increasing real income.

sharing, annexation, and creation of regional authorities that provide specialized services.

While regional planning agencies, which attempt to coordinate policies across city and suburban jurisdictions, are common in the United States, regional governments are not. Local governments have, in general, been unwilling to relinquish local tax revenues and local control to metropolitan governments. (One notable exception is the Minneapolis Metropolitan Council, which collects taxes throughout the metropolitan area and redistributes the tax revenues according to prespecified formulas. See *Regional Government and Tax Sharing in Minneapolis-St. Paul.*) In many cases, however, county governments are partially regional governments in that counties frequently contain both cities and suburbs. To the extent that county governments provide services, such as court systems, corrections facilities, and the administration of the welfare system, they provide a mechanism by which cities and suburbs can share fiscal burdens. Counties are not truly regional governments, though, since one county seldom contains an entire metropolitan area. In addition, 15 large central cities, including Philadelphia, are counties themselves and, hence, have no opportunity to share fiscal burdens with their suburban neighbors.

Another form of regionalization is annexation, which allows cities to grow by incorporating the suburbs into the city jurisdiction as the metropolitan area grows. Annexation effectively limits the competition among local governments by reducing their number. Annexation is common in all areas of the country except the New England and mid-Atlantic census divisions.⁸ The city of Houston, for example, annexed 219 square miles from 1960-90, increasing its overall land area 68 percent. Annexation has allowed the city to retain the lion's share—58 percent—of the metropolitan area population. On the other hand, annexation is uncommon in most older metropolitan

areas that have well-established suburban jurisdictions.

The most common form of regionalization is the formation of authorities that span several jurisdictions to provide specific services. Transit authorities are perhaps the most common manifestation of authorities that provide regional services. Regional authorities frequently share local tax revenues and provide services that are in the interest of the entire region. These organizations also tend to redistribute resources because the net benefits may not be distributed equally throughout the metropolitan area.

Advantages of Regional Approaches. To the extent that city decline is driven by factors associated with high concentrations of poverty, there are strong arguments in favor of regional approaches to improving the economy of cities.⁹ First, the fiscal burdens of supporting poorer residents can be spread over a wider tax base. In particular, taxes to finance implicit and explicit income transfers are no longer paid only by middle and upper class city residents; rather, all middle and upper income

⁸States differ widely in their laws governing annexation. See the book by David Rusk, pp. 98-101, for a brief discussion of differences across states. Annexation is the rule in the Mountain and West South Central census divisions, where only 1 of 56 central cities in MSAs did not annex during the period 1960-90. Annexation is common in the South Atlantic, East North Central, East South Central, West North Central, and Pacific divisions as well. About 78 percent of central cities in these census divisions annexed land.

⁹Most examples of regional cooperation are not directed explicitly toward solving central city problems. Regional cooperation is most common where there are direct benefits to both city and suburbs. For example, there may be large economies of scale in production of some public services, such as sewage and water treatment, or network economies associated with coordination, as is the case with transit systems. In these cases, there are direct benefits to both cities and suburbs, and, hence, cooperative agreements are relatively easy to forge.

Regional Government and Tax Sharing in Minneapolis-St. Paul

Like many metropolitan areas, Minneapolis-St. Paul has a complex local government structure, with three cities designated as “main central cities” (Bloomington is the third), seven counties, 138 cities, 50 townships, and numerous other jurisdictions serving specific purposes.^a What is unique about this metropolitan area, however, is a relatively strong metropolitan governmental unit—the Metropolitan Council—which is complemented by formula-based regional tax sharing.

Judith Martin (1993) cites several reasons why Minneapolis-St. Paul developed relatively strong metropolitan governance and regional tax sharing: the relative homogeneity of the population; a tradition of cooperation, perhaps born of geographic isolation; and the fact that there were originally two central cities (together having less than 30 percent of the population). Martin suggests that the presence of these factors meant that foes of regionalization had less of a focal point for opposition. However, the Metropolitan Council is not a regional government born out of an agreement of local jurisdictions to cede part of their power for the region’s welfare. Rather, a sufficient number of communities supported the formation of the Council and the implementation of tax sharing and thus were able to bring both into being through the state government.

In 1967, an act of the state legislature created the Metropolitan Council, which replaced the Metropolitan Planning Commission formed 10 years earlier. The Council reviews and coordinates plans for long-term investments among local and county governments as well as oversees the budgets of various regional operating authorities such as the transit system, the airport, and the sewage system.^b The truly unique aspect of regionalism in Minneapolis-St. Paul, however, is regional tax sharing. The Fiscal Disparities Act of 1971 stated that 40 percent of the net gain in new commercial and industrial property tax revenue would go into a metropolitan area pool and would be distributed by formula. The formula was designed to provide greater shares to jurisdictions with larger populations and a lower property tax base.^c

Most observers believe that the Metropolitan Council has had a positive impact in resolving regional transportation, environmental, and housing issues. The effects of the tax-sharing plan are mixed. In the early years, the central cities were net recipients, but by the 1990s, they were net contributors. Martin notes that in recent years, residential suburbs, which have little commercial growth, have benefited increasingly from the tax-sharing plan. Neither the Metropolitan council nor the tax-sharing plan has reversed the trend of declining tax bases and increasing concentration of lower income residents in the cities of Minneapolis, St. Paul, and Bloomington.^d Moreover, creation of the Metropolitan Council and regional tax sharing have not eliminated regional controversies. Distant suburban areas often view the council as a hindrance to growth. Furthermore, growth has spread beyond the boundaries of the council into areas over which it has no control, illustrating that regions, like central cities, have boundaries, and people can avoid even regional policies by moving just over these boundaries.

^aSee Judith Martin’s article for an in-depth discussion of governance in the Minneapolis-St. Paul metropolitan area.

^bWhile the Metropolitan Council has a fairly strong oversight role in the planning and investments made in areas deemed of regional significance, it had not undertaken direct investment until recently. In this respect, organizations such as the Port Authority of New York and New Jersey, which is self-funded through operations, have been more direct players in the regional economy, investing in a wide range of development projects, most of which are regional in nature.

^cAndrew Reschovsky gives a detailed discussion of the sharing formula.

^dSee Karen Baker and associates for a discussion of recent trends in fiscal disparities in the Minneapolis region.

residents in the metropolitan area share these costs.¹⁰ Second, the incentives to sort into rich and poor communities are reduced. When residents of a metropolitan area can avoid taxes without a corresponding loss of benefits simply by moving to another local jurisdiction, they will do so unless the costs of moving are very high. David Rusk found less racial segregation and less divergence in city and suburban incomes in central cities that are more regional in nature—those that can annex land or those that already contain a great deal of open space within their borders.¹¹

Lowering the incentives for individuals to separate into rich and poor communities may increase the productive capacity of the metropolitan area economy. Roland Benabou argues that the presence of highly educated and skilled (and therefore high income) individuals tends to facilitate the education and training of others. Sorting into rich and poor communities is likely to lower the return to time and effort spent on education in poor communities, thereby reducing the economic potential of the poor community and its residents and, ultimately, the metropolitan area's aggregate production and income. Benabou's theoretical result is consistent with my finding that higher growth of income in the city has a positive impact on growth in the suburbs.¹²

¹⁰Based on evidence from the Washington, D.C., metropolitan area, Seth Sacher argues that the primary effects of replacing a system of fragmented local governments with a metropolitan government would be to lower the burden of taxation on upper income city residents at the expense of upper income suburban residents, rather than providing more net resources to the city as a whole.

¹¹Rusk terms these cities "elastic" central cities, for their ability to absorb new growth within their borders.

¹²In an article examining the differences in growth rates across cities, Robert Lucas suggests that there may be gains from concentrations of highly educated people working close together. That is, the return to education and other skills may be higher in labor markets that have high

Regional support for poorer residents frees cities from the adverse economic consequences of pursuing local income redistribution.¹³ Whether the costs to suburban areas associated with regional cooperation in support of the poor are offset by the benefits of a healthier city is an empirical question. While no one has calculated both the costs and benefits of regional efforts to improve a city's economy, in my 1994 article, I provide evidence that the potential benefits to the suburbs of improved growth in the city are large.

For example, in Philadelphia in the 1980s, if real income in the city had grown at the suburban rate of 19 percent instead of the city average of 14.3 percent, the average growth rate for income in the suburbs would have increased an additional 2.9 percentage points and the rate of appreciation for suburban houses would have been 6.5 percentage points higher.¹⁴ These estimates imply that an individual who earned \$50,000 a year in 1980 and who owned a \$200,000 house would have gained more than

concentrations of highly skilled individuals. Lucas's and Benabou's arguments are not necessarily inconsistent with one another. For example, a concentration of highly skilled people could generate Lucas-type benefits, while at the same time suffer from the Benabou-type problems of sorting within the metropolitan area.

¹³David Wildasin notes that communities may have preferences for income equality and that these preferences may differ across local communities. If local communities redistribute income individually, there are fiscal externalities that result in an inefficient distribution of the population. Only through coordinated distributive policies or through the intervention of a higher level of government can these externalities be eliminated.

¹⁴These estimates are based on the preferred models in my 1994 article, tables 3 and 4, column 2. The value of the effect on suburban income is the sum of increased income in each year of the decade (.29 percent in year 1 increasing to 2.9 percent in year 10), based on a Philadelphia population of 1.6 million. The house value increases 6.5 percent. The sum of these impacts is then converted into 1995 dollars.

\$38,750 in current dollars over the decade from the improvement in average income growth in the city. These calculations do not, however, reflect the costs associated with regional policies designed to increase the rate of income growth in the city.

Disadvantages of Regional Approaches. While the regional consequences of city decline provide strong arguments for regional cooperation to solve problems that have become concentrated in central cities, regional approaches are not without shortcomings. Just as local governments suffer adverse consequences when they pursue policies that redistribute income, entire metropolitan areas may suffer as well if redistribution is too large. After all, if the tax burden becomes too large given the services provided, individuals and firms can choose to relocate to another metropolitan area. Of course, the costs of changing metropolitan areas are greater than those of moving from city to suburb, so regions may have more latitude for redistribution, but redistributive policies are best carried out at the highest level of government.

Another drawback is that regional approaches may be less responsive to the desires of local residents. Regional organizations necessarily have constituent populations that are more heterogeneous, so that the likelihood that public policies meet the demands of all residents is reduced. In addition, because regionalization reduces an individual's ability to choose among jurisdictions, public choice economists have pointed out that reduced competition among jurisdictions may result in less efficient production of public services.¹⁵

In a 1993 article, James McAndrews and I considered the likelihood that local communities would adopt a regional agreement that would actually mitigate negative regional impacts, given that there may be significant dif-

ferences in the degree of political power across local jurisdictions. We found the somewhat pessimistic result that unequal political influence reduced the likelihood that solutions beneficial to the entire region can be realized. For example, if declining central cities are too weak politically, they may not be able to strike regional bargains that sufficiently improve the economic competitiveness of the central city, and the long-run regional benefits of city improvement will not be realized.

The most difficult hurdle for any regional approach to central city problems is overcoming suburban residents' skepticism that an investment in solving city problems will have a sufficient return for noncity residents. While statistical findings, such as those presented in my 1994 article, suggest common economic interest, most suburban jurisdictions resist regional efforts designed specifically to improve central cities.

NEIGHBORHOOD SOLUTIONS: CAN THE SUM OF THE PARTS BE GREATER THAN THE WHOLE?

In contrast to the regional approach, one may look to the success of smaller, suburban jurisdictions as a model for city revitalization. Just as there are significant differences among suburban jurisdictions, neighborhoods within central cities are not uniform; incomes, education, social cohesion, and underlying economic potential differ widely across central city communities.¹⁶ (See *Four Philadelphia Neighborhoods: A Profile*.) Many areas within cities have physical and historical attributes that give them unique economic opportunities, while others suffer from disadvantages unlikely to be over-

¹⁵See, for example, Robert Premus.

¹⁶In a 1994 study, Richard Nathan and colleagues present an interesting portrait of differences among minority communities in Brooklyn. Contrary to common perception, Nathan finds significant social, economic, and cultural resources among many of these communities.

Four Philadelphia Neighborhoods: A Profile

In 1854, the current boundaries of Philadelphia (map) were formed through the conglomeration of 29 smaller jurisdictions. Philadelphia was a true regional government that included nearly rural tracts in the Township of Germantown (now known as Chestnut Hill and Mount Airy) and the original city of Philadelphia (Philadelphia's central business district, known as Center City). To illustrate the diversity of city communities, we have developed statistical portraits of Chestnut Hill/Mount Airy, Center City, Port Richmond, and West Philadelphia using 1980 and 1990 census data. These areas roughly correspond to the four original communities of the Township of Germantown, city of Philadelphia, Richmond, and Blockley.



Demographically, these communities range from largely white communities (Port Richmond, 96.9 percent, and Center City, 85 percent) to largely African American (West Philadelphia, 79.3 percent). Chestnut Hill/Mount Airy is racially integrated (49.4 percent African American).^a These communities vary widely in the average education of their residents: only 4.8 percent of the residents in Port Richmond have completed four years of college; in West Philadelphia, 12.6 percent; in Chestnut Hill/Mount Airy, 45.2 percent; and in Center City, 62.2 percent. Crime, as reflected in the 1993 murder rate, varies widely across communities. The West Philadelphia murder rate, at 34 murders per 100,000 population, is above the citywide average of 27.1. The next highest, Port Richmond, at 8, was less than one-third of the city average. Both Center City and Chestnut Hill/Mount Airy had murder rates of less than 5 per 100,000.^b

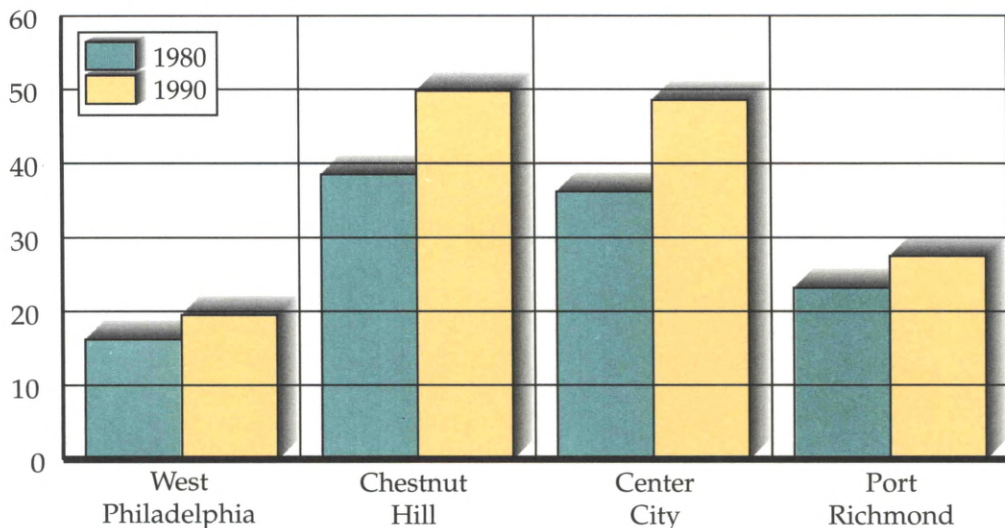
In terms of income, both the levels and growth rates in the 1980-90 period differ markedly across neighborhoods (chart). The average real household income of Chestnut Hill/Mount Airy and Center City residents is almost twice as high as that in either West Philadelphia or Port Richmond. In terms of real income growth, incomes of Center City residents grew 34.1 percent in the 1980s, more than triple the pace of income growth for West Philadelphia residents (11.3 percent) and almost double the pace of that for Port Richmond residents (18.7 percent). At 29.2 percent, income growth in Chestnut Hill/Mount Airy was only slightly slower than in Center City. The growth rate for Center City exceeded the city average of 21 percent and even the average growth of 32.5 percent in suburban Philadelphia. These figures illustrate that, while the average income of city residents grew more slowly than that of their suburban counterparts, the portrait of declining relative city incomes is not uniform.

^aWithin the Chestnut Hill/Mount Airy area, there are three distinct communities: Chestnut Hill, West Mount Airy, and East Mount Airy. Of these three, only West Mount Airy is racially balanced, while Chestnut Hill is predominantly white and East Mount Airy is predominantly African American.

^bRobert Warner and Don Russell of the Philadelphia *Daily News* provided these figures. Using original police data, they mapped murders to census tracts. These data were, in turn, used to calculate murder rates in each community.

Mean Household Income

Thousands of 1990 Dollars



come. Many city neighborhoods have the advantage of proximity to major centers of commerce and education, transportation, and the historical and cultural hub of the region. On the other hand, some city neighborhoods suffer from environmental degradation from an earlier industrial heritage, obsolete and substandard residential and commercial structures, and degraded infrastructure and social structure. For central cities to prosper, they need to identify their strengths and develop mechanisms that allow communities that have strong comparative advantages to prosper.¹⁷

One way to enable central city neighborhoods to reach their economic potential may be to increase the autonomy of city neighborhoods. In the extreme, localization could take the form of creating new, smaller, independent jurisdictions on a scale similar to that of suburban jurisdictions. While dissolution of cities into smaller jurisdictions is rare, in the Netherlands, Rotterdam recently considered subdividing into 12 jurisdictions.¹⁸ Somewhat more common, parts of cities seek to withdraw from the larger city, usually to avoid actual or perceived intracity income transfers. Staten Island, a borough of New York City, has had a fairly strong secession movement for years. Similarly, in Philadelphia, local representatives of neighborhoods in Northeast Philadelphia have raised the issue of secession. Dissolution and secession are unequivocal means of achieving local autonomy.

One less drastic and increasingly popular method for expanding local autonomy is the

creation of special service districts. Typically, special service districts are organized by neighborhoods to provide specific services, such as cleaning, maintenance, and security, over and above that provided by the city government. These organizations often have legislative approval to levy a tax to finance their activities and have local control over the expenditures. Philadelphia, for example, has two special service districts and at least two more are planned. These districts allow neighborhoods exclusive control over at least a part of their locally generated tax revenues. They provide a mechanism by which a community can invest in local improvement and better match the community's demand for public services with the supply.

There are other ways to increase local autonomy within a city as well. Decentralization of public education, even within the framework of a single school district, is currently a subject of great interest. Local home and school associations that raise funds for particular neighborhood schools fit hand in hand with decentralization. These types of activities, like the special service districts, all increase local autonomy within the city. For these activities to dramatically increase local autonomy, decentralization must involve both local control and dedicated neighborhood sources of funds.

Advantages of Localization. Localization has a number of significant potential benefits for central city economies. Unlike regionalization, increasing local autonomy can result in a better matching of public policies with the desires of local residents, which, in turn, may improve the quality of basic services. For example, communities may have a greater impact on the quality of local schools if changes involve only a couple of local schools rather than all schools in a large city school district. At the same time, increasing local autonomy would tend to reduce unsustainable local income redistribution that induces middle class residents to leave the city, further reduc-

¹⁷Michael Porter argues forcefully that cities should focus investments—public and private—on the cities' primary areas of comparative advantage. Attempting to go against the grain of basic market forces is unlikely to meet with success. While Porter was not speaking in geographic terms, the principle is the same.

¹⁸The subdivision plan was rejected by Rotterdam voters.

ing city resources. Local residents may be willing to expand their investments in the local community if they are confident that these investments have an impact on that community. Economically viable communities would be on a more level playing field with their suburban counterparts. Not only would they be at less of a disadvantage in competing for residents and firms, but they would also be in a better position to form cooperative agreements with suburban neighbors, when it is in the common interest.

Increasing the autonomy of local city neighborhoods is likely to result in the economic expansion of communities with unique economic advantages, providing the city with internal sources of growth and prosperity. Healthy city neighborhoods are likely to have a positive influence on other, less advantaged neighborhoods. Consider, for example, Center City Philadelphia (or any large city's central business district). Center City Philadelphia generates a great deal of tax revenue, a significant part of which supports basic services to neighborhoods throughout the city. If Center City were, in the extreme, an autonomous jurisdiction, it probably would require much lower tax rates and would have higher service levels. It would therefore be a more attractive location for businesses and residents. At the same time, a vibrant central business district would likely increase the desirability of neighboring communities, simply because of their proximity.

In addition to improving the conditions of economically viable communities, increasing local autonomy will almost certainly make it easier to target resources, from higher levels of government, that are intended to fight poverty, so that a greater fraction of these funds actually reaches lower income people. Communities no longer economically viable will be painfully evident if they are no longer supported by the rest of the city.

Disadvantages of Localization. The list of

disadvantages of localization is shorter than the list of advantages, but the negative consequences of failing to address the primary disadvantage—that communities with few economic resources will lose the support of the larger city community—are potentially severe. Economically vulnerable communities may be unable to sustain basic services, and in the absence of financial support from higher levels of governments, this inability may involve unacceptable hardships for the residents of these communities. As Bryan Ellickson pointed out in a 1977 article, residents of poor neighborhoods are unlikely to support localization policies without some form of side payment from wealthier communities.

If an aggressively pursued localization strategy fails to address the needs of residents in disadvantaged communities, gains from the localization strategy in potentially prosperous city communities may be undermined. Just as my 1994 study found strong evidence that city decline adversely affects suburbs, it is even more likely that neighboring communities in a city are interdependent. Problems in one community are likely to spill over into neighboring communities simply because of proximity. Although this cross-community interdependence argues against localization strategies, cities cannot, by themselves, sustain the income transfers needed for the residents of failing communities. Increasing local autonomy can potentially increase the economic prospects for many communities in the city, but unless the negative consequences to the residents of economically vulnerable communities are addressed, the potential of localization to generate the metropolitan-area-wide benefits of a healthy central city is unlikely to be realized.

COMBINING LOCAL INITIATIVE AND REGIONAL COOPERATION

Both local and regional approaches have strengths and weaknesses. Careful analysis

suggests that there are clear and distinct roles for local and regional initiatives for improving the economic health of central cities and for generating significant positive benefits for the entire region. Localization strategies are effectively place-oriented policies that enable city communities to pursue their comparative advantages. Local initiatives should focus on policies that eliminate explicit or implicit intracity redistribution of income so that economically viable city communities can prosper. Special service districts, which have the power to tax and spend at the local level, are good examples of policies that enhance local autonomy. As long as there are complementary programs to address the needs of residents in economically distressed communities, localization policies need not attempt to artificially sustain these communities in their current configuration.

My research suggests that the regional benefits of improving central city economies are large. Regional initiatives designed to achieve these benefits should focus on two areas.

First, the needs of lower income residents are best addressed by people-oriented policies. A growing body of research (see the article by George Borjas, for example) suggests that neighborhood environment plays an important role in the social and economic success of individuals. This research suggests that eliminating the incentives that encourage people to separate themselves into rich and poor communities and encouraging residents of failing

communities to make the transition to viable communities have the best chance of improving both city neighborhoods and the welfare of the poorest city residents. Financial support for these programs can be sustained on a regionwide basis, although even higher levels of government would be more appropriate.

Second, regional support is needed for services and amenities that are regionally beneficial and regionally valued. Some services, such as transit systems, are crucial to the survival of densely populated central cities and warrant regional support because of the indirect impact of these systems on the regional economy. Other amenities typically located in cities, including cultural, historical, and recreational facilities, deserve regional support because residents throughout the region value them.

One key to an economically vital metropolitan area is an economically vital central city. To improve central city economies, we need to provide the opportunity for viable city communities to build on their strengths. However, the declining fortunes of residents in economically vulnerable communities threaten the revitalization of viable city neighborhoods. The potentially large regional economic benefits of a healthy central city suggest that it is in the region's interest to provide regional support for residents in economically vulnerable communities and for services and amenities located in the city that have positive regional impacts.

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Does Monetary Policy Have Differential Regional Effects?

*Gerald A. Carlino and Robert H. DeFina**

In simple textbook descriptions, monetary policy actions have a uniform national effect. In reality, the nation is made up of diverse regions that are linked but that respond differently to changing economic circumstances. For example, the large declines in crude oil prices in the mid-1980s affected energy-producing regions very differently from energy-consuming regions. Indeed, the notions of a “rolling

recovery” and of a “bi-coastal recession” have already entered the business vocabulary and suggest that the timing and perhaps the magnitude of ups and downs in economic activity vary across regions. The idea that monetary policy can have varied effects across regions is a short and logical next step. In fact, almost 40 years ago, Walter Isard, founder of the Regional Science Association, stated that “since each of [the nation’s] regions has different resource potentials and confronts different obstacles to growth, it follows that monetary policies alone generate both retarding factors for some regions and problem intensifying factors for other regions.”

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Despite long-standing interest and concern about the issue, there is, at present, little empirical evidence on whether and to what extent monetary policy actions have differential effects on regional economic activity. Monetary policymakers have access to a lot of information about regional economic conditions. They acquire this information through periodic reports from regional Federal Reserve Banks (Beige Book reports) and through the regional business data gathered by the presidents of the 12 Federal Reserve Banks, who attend meetings of the Federal Open Market Committee (FOMC). Additional information on differences in the impact of monetary policy across regions may aid policymakers in their consideration of regional developments in the formulation of national monetary policy.

WHY MIGHT MONETARY POLICY AFFECT REGIONS DIFFERENTLY?

Economic theory suggests at least three reasons why monetary policy might have differ-

ential effects across regions: regional differences in the mix of interest-sensitive industries, in the ability of banks to alter their balance sheets, and in the mix of large and small borrowers.

Regional Differences in the Mix of Interest-Sensitive Industries. Different industries respond quite differently to changes in interest rates. These different responses may interact with the different mix of industries across regions, and this interaction may result in differential regional effects of monetary policy. For example, changes in interest rates are likely to have profound effects on people's ability to buy houses and on businesses' willingness to acquire new structures. Construction accounted for almost 8 percent of real gross state product (GSP) in the Rocky Mountain region in 1980, but a little more than 4 percent of New England's real GSP (Table 1). In addition, manufacturing, another interest-sensitive sector, accounted for just over 30 percent of GSP in the Great Lakes region in 1980, but less than 12

TABLE 1

Percent of Gross Regional Product Accounted for by Major Industry (1980)

Region	Agri	Mining	Const	Mfg	Trans. & Pub. Util.	Trade	FIRE	Service	Govt	Pop (% of US)
New England	0.96	0.13	4.02	27.1	8.20	16.3	15.1	17.0	11.2	5.4
Mideast	0.82	0.52	4.12	21.6	10.30	16.3	16.1	17.2	13.0	17.8
Great Lakes	2.36	1.04	4.37	30.2	9.40	15.9	14.0	13.1	9.7	17.2
Plains	6.50	1.99	4.85	20.0	10.50	17.4	15.4	12.9	10.6	7.2
Southeast	2.52	5.90	5.80	20.6	9.60	16.1	13.3	12.5	13.7	23.7
Southwest	2.03	17.50	6.60	15.5	9.20	14.9	12.8	11.3	10.2	10.2
Rocky Mountain	3.93	10.60	7.60	11.6	10.50	15.1	15.4	12.6	12.7	3.0
Far West	2.97	1.70	5.50	18.1	8.10	16.8	18.0	16.5	12.3	14.9
United States	2.45	4.20	4.79	21.9	9.02	16.2	15.5	14.04	11.7	

See Appendix A for breakdown of regions.

Source: Compiled from Bureau of Economic Analysis data

percent of the Rocky Mountain region's real GSP. Compounding these differences are interregional trade relationships, which can transmit localized responses differently across regions.

Regional Differences in the Ability of Banks to Alter Their Balance Sheets. Fed policy actions can have varied effects on different banks' ability to make loans. During periods of tight monetary policy when bank reserves are restricted, some banks can find alternative sources of funding for loans more cheaply and more easily than others, for example, by issuing large denomination CDs. Such banks' lending will be less sensitive to monetary policy changes. Anil Kashyap and Jeremy Stein propose that bank size largely explains differences in financing abilities: large banks have more funding options than small banks. Thus, regions in which a disproportion-

ately large share of bank loans are made by small banks might respond more to monetary policy actions than regions in which a large share of loans are made by the nation's large banks.

One way that Kashyap and Stein define small banks is those with total assets at or below the 90th percentile. Alternatively, John Boyd and Mark Gertler classify a bank as small if its assets are less than \$300 million. Since the asset size of the 90th percentile was just under \$300 million in 1994, Kashyap and Stein's definition is equivalent to Boyd and Gertler's classification. The regional distribution of loans made by banks with total assets at or below the 90th percentile in 1994 is given in Table 2. Whether we look at all small banks or only small banks that are *not* members of a bank holding company, the regional distribution of loans made by small banks is highly unequal,

TABLE 2

Share of Total Loans Made by a Region's Small Banks

December 31, 1994

	All Small Banks		Small Banks Not in Holding Co.	
	No. ^a	Loans (%)	No. ^b	Loans (%)
New England	129	8.5	119	7.7
Mideast	448	4.4	374	3.4
Great Lakes	1743	21.4	1147	11.8
Plains	2221	44.3	1732	25.3
Southeast	2211	21.7	1593	14.1
Southwest	1356	26.2	1102	20.0
Rocky Mountain	472	33.9	298	18.7
Far West	457	8.4	417	7.6

^aThe number of banks in each region that are at or below the 90th percentile in terms of total assets (compared with all banks in the nation). See Appendix A for breakdown of regions.

^bThe number of banks in each region that are at or below the 90th percentile in terms of total assets (compared with all banks in the nation) and are not members of a multi-bank holding company.

Source: Compiled from Call Reports

suggesting that monetary policy could have differential regional effects.¹

The effect of the differences in regions' reliance on small banks will be diluted if bank-dependent borrowers can obtain credit from sources outside their own regions. However, there is evidence that banking markets tend to be segmented along regional lines. Craig Moore and Joanne Hill note that since banks can identify and monitor local investment projects more efficiently than banks and investors in other regions, it will be less costly for households and small firms to borrow from local banks.²

Regional Differences in the Mix of Large and Small Borrowers. Regional differences in the proportion of large and small borrowers and the sources of credit available to each also could lead to different regional responses to monetary policy. According to the credit view of monetary policy, Fed actions affect economic activity by altering banks' ability to provide loans.³ To the extent that some bor-

rowers are constrained to obtain credit from banks, monetary policy changes will substantially affect their ability to spend. Large borrowers usually have greater access to alternative, nonbank sources of funds, such as the issuance of corporate stocks and bonds or commercial paper. By contrast, small borrowers, such as individuals and small businesses, typically have banks as their sole sources of credit. Consequently, activity in a region that has a high concentration of small borrowers could be especially sensitive to changes in Fed policy.

The percentage of small firms (defined as regional firms with fewer than 500 employees) varies widely across regions (Table 3). It ranges from a low of 66 to 67 percent in the New England, Mideast, and Great Lakes regions to a high of about 82 percent in the Rocky Mountain region.⁴

¹As a member of a bank holding company, a small bank can issue large denomination (uninsured) CDs at more favorable rates because it can rely on the financial strength of the larger bank holding company. Note also that although the data indicate the location of the lending bank, they do not specify the locations of the borrowers. One reason for focusing on the lending patterns of small banks is that they tend to specialize in loans to local customers. Large banks tend to make loans outside their local market.

²Katherine Samolyk found that, during the 1983-90 period, conditions of the local banking sector explained more of real personal income growth in states where bank loan quality was poor than in those states where banking conditions were relatively healthy.

³The "credit view" of monetary policy is discussed in Ben Bernanke's articles. As pointed out by Mark Gertler and Simon Gilchrist (1994) and Stephen Oliner and Glenn Rudebusch (1995), the credit view assumes that banks do not fully insulate their loans from changes in reserves following monetary policy actions, and that borrowers cannot fully insulate spending from changes in the supply of bank credit.

⁴In a controversial paper, Anil Kashyap, Jeremy Stein, and David Wilcox find evidence for an aggregate bank lending channel for monetary policy. Daniel Thornton finds a positive but small relationship between monetary policy actions and bank lending prior to the early 1980s. After the early 1980s, Thornton found no evidence of such a relationship. He concludes that financial innovation and changes in reserve requirements under the Monetary Control Act of 1980 have essentially eliminated any relationship between monetary policy changes and bank lending. (The study by Kashyap, Stein, and Wilcox and the one by Thornton do not differentiate the effects of monetary policy on small vs. large firms.) Using manufacturing data, Oliner and Rudebusch found no evidence of a substitution away from bank loans for either small or large manufacturing firms following a monetary contraction. Rather, the main effect of a tightening of monetary policy is to redirect *all types* of credit (e.g., commercial paper, loans from finance and insurance companies, and trade credit) from small manufacturing firms to large manufacturing firms. Oliner and Rudebusch refer to the redistribution of all types of finance as a *broad credit channel* for monetary policy as opposed to a narrower bank lending channel. Similarly, Gertler and Gilchrist found that small manufacturing firms contract substantially more than large manufacturing firms following a tightening of monetary policy.

TABLE 3

**Share of
Total Regional Employment
Accounted for by a
Region's Small Firms***

New England	66.2%
Mideast	67.0%
Great Lakes	66.5%
Plains	77.1%
Southeast	73.3%
Southwest	76.9%
Rocky Mountain	82.4%
Far West	77.9%

*Percent of total regional employment accounted for by firms with fewer than 500 employees in 1981. See Appendix A for breakdown of regions.

Source: Compiled from data on county business patterns

**DOES MONETARY POLICY
AFFECT REGIONS DIFFERENTLY?**

While Fed policy actions can conceivably affect regional economies differently, little is known about the actual impact of Fed policy in different areas of the country. Some attention has been paid to the effects of monetary policy on region-specific banking flows as opposed to economic activity. Studies by Randall Miller and Peter Bias have found that Federal Reserve policy actions do affect regional banking flows differently. More typically, evidence has been collected about the effects of monetary policy actions on nominal income in particular regions.⁵ Results from these studies suggest that monetary policy has substantially different impacts in different regions.

⁵See the studies by William Toal; Charles Garrison and Hui Chang; John Beare; Vijay Mathur and Sheldon Stein; and Charles Garrison and John Kort.

However, this research contains a notable shortcoming. Existing studies measure the impact of monetary policy region by region without accounting for feedback effects among regions (i.e., monetary policy can directly affect the New England region, but because New England trades with the Mideast region, monetary policy indirectly affects the Mideast region and vice versa).

In an earlier study, we documented the importance of feedback effects among U.S. regions using a statistical technique known as vector autoregression (VAR).⁶ Our VAR included eight equations, one for real income growth in each region. For each equation, a region's real income growth depended on past values of its own and the other regions' real income growth.

By considering the system as a whole, rather than one equation at a time, the model allowed us to trace the effects of a change in a particular region's real income growth on real income growth in all other regions. For example, if income growth in New England rises, income growth in all other regions will be affected, since developments in New England will eventually affect other regions. Moreover, after the initial effect, continuing feedback effects on all other regions will occur, with the subsequent effects becoming smaller and smaller.

In a follow-up to that study, we used a VAR to estimate both the direct effects of *changes in monetary policy* on real personal income growth at the regional level and the spillover effects on income growth among regions.⁷ The variables

⁶See Gerald Carlino and Robert DeFina (1995a). A VAR is a widely used modeling technique for gathering evidence on business-cycle dynamics. VARs typically rely on a small number of variables expressed as past values of the dependent variable and past values of the other variables in the model. See Theodore Crone's article for a discussion of VARs as applied to regional analysis.

⁷See Gerald Carlino and Robert DeFina (1995b).

in our model included real personal income growth in each of the eight major regions defined by the Bureau of Economic Analysis (see *Appendix A* for a breakdown of the regions), the change in the relative price of energy (to account for the effects of oil price shocks), and the change in the federal funds rate (as a measure of changes in monetary policy). The study employed quarterly data for the period 1958-92.

A typical way to summarize the impacts of policy on personal income growth, and one that captures all interregional dynamics, is the cumulative impulse response. The cumulative impulse response shows how the level of real personal income in a region changes over time because of a monetary policy surprise. Monetary policy surprises are measured by unanticipated changes in the federal funds rate.⁸ For example, in fall 1994, Fed actions raised the federal funds rate 0.75 percentage point. Shortly before that time, forecasters were publicly predicting an increase of 0.25 percentage point. Thus, the additional 0.50 percentage point was a policy surprise or innovation.

The figure on page 23 shows the estimated cumulative response in real personal income for each region resulting from an unexpected

increase of one percentage point in the federal funds rate. The cumulative response of U.S. aggregate real personal income (a weighted average of the regional responses) is included as a benchmark for comparison. An unexpected increase in the fed funds rate lowers real income in all regions relative to what it would have been otherwise.

We found that an unexpected one-percentage-point increase in the federal funds rate reduces real *growth* temporarily and, thus, leaves the *level* of real personal income below what it otherwise would have been for about two years. The model treats tightening and easing of the fed funds rate symmetrically, so that an unexpected cut in the funds rate temporarily raises real personal income relative to what it would have been otherwise. Since there are both unanticipated increases and decreases in the federal funds rate over time, we should not conclude that monetary policy lowers real personal income on average.

Interestingly, not all regions respond by the same magnitude. Several regions generally respond to monetary policy surprises with a magnitude and timing similar to those of the national economy. Specifically, the responses of income in five regions (New England, Midwest, Plains, Southeast, and Far West), called core regions, mirror the national response. In those regions, income ultimately falls about 1 percent (compared with what it would have been) subsequent to the one-percentage-point increase in the federal funds rate.⁹ The core regions accounted for 68 percent of aggregate 1980 gross state product (GSP) in the United States and for 70 percent of total U.S. population.

Other regions (Great Lakes, Southwest, and Rocky Mountain), called noncore regions, show

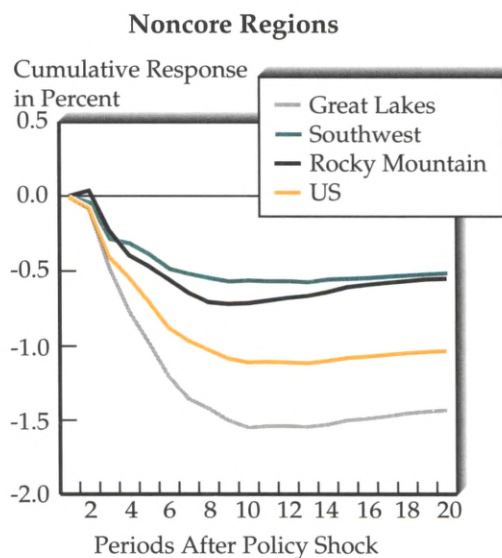
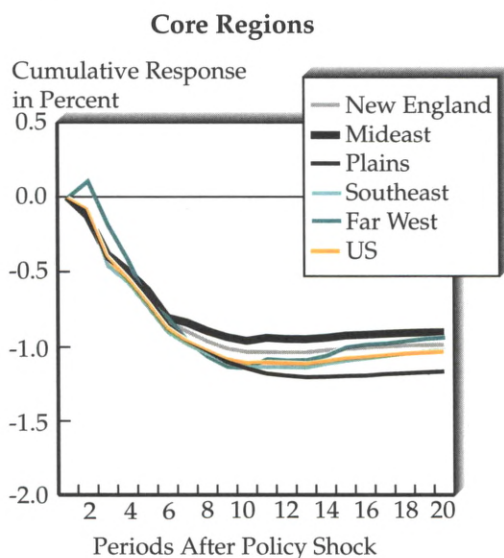
⁸The model includes an equation that predicts changes in the federal funds rate on the basis of a year's worth of past data for each of the following variables: the change in the federal funds rate; real personal income growth in each of the eight major regions; and the change in the relative price of energy. Unexpected changes in the federal funds rate are measured by taking the difference between the actual and predicted change. Unexpected changes in the federal funds rate are used to proxy monetary policy surprises in the policy simulations that follow. The analysis assumes that unexpected changes in the federal funds rate arise only from policy surprises. Some economists believe that only unanticipated changes in monetary policy affect real economic variables. See Shaghil Ahmed's article for a fuller discussion of the distinction between unanticipated and anticipated monetary policy and its effect on real activity.

⁹The terminology "core regions" is taken from Tamim Bayoumi and Barry Eichengreen, who use it in a related, but somewhat different, way.

Response of Real Personal Income to a One-Percentage-Point Unexpected Increase in the Fed Funds Rate*

Some Region's Responses Mirror the Nation's...

...Other Region's Responses Do Not



*Graphs show the percent difference in real regional personal incomes from what they would have been without the unanticipated increase in the fed funds rate.

magnitudes of monetary policy effects quite different from the magnitudes for the national economy. The noncore regions accounted for 32 percent of total 1980 GSP in the United States and for 30 percent of U.S. population. Personal income in the Great Lakes region showed the largest response to an unexpected increase of one percentage point in the fed funds rate, dropping about half again as much as income in the core regions. The Great Lakes region accounts for 18 percent of total GSP. In two other regions (Rocky Mountain and Southwest), personal income is much less responsive to an unanticipated one-percentage-point increase in the fed funds rate than income in the core regions, falling about half as much. Together these two regions account for 14

percent of aggregate GSP and 12 percent of the U.S. population. The Rocky Mountain region is the smallest, accounting for only 3 percent of aggregate GSP and only 3 percent of the nation's population.¹⁰

After eight to nine quarters, real personal income begins to recover in most regions. Although the forecasted level of real regional personal income appears to remain below the

¹⁰In a more formal statistical test, the cumulative responses for the five regions that make up the core are found to be insignificantly different from the national cumulative response at the 5-, 10-, 15-, and 20-quarter horizons. In contrast, the cumulative responses of the noncore regions are generally found to differ significantly from the cumulative response of the nation.

level that would have existed in the absence of the unanticipated increase in the fed funds rate, we cannot conclude that the level of regional personal income will remain permanently lower.¹¹

WHAT CAUSES THESE DIFFERENTIAL RESPONSES?

We identified three ways in which monetary policy could have differential regional effects: regional differences in the mix of interest-sensitive industries, in banks' ability to adjust their balance sheets, and in the mix of large and small borrowers. How important are these factors in accounting for the different regional responses to monetary policy innovations?

To answer the question, we analyzed whether cross-regional differences in the size of real income responses are systematically related to variables capturing these three factors (see *Appendix B*). Having so few observations makes it difficult to sort out the various ways in which monetary policy affects the economy of regions, but our findings are suggestive.

The interest sensitivity of a region's industries is likely to rise with the percent of a region's total gross state product accounted for by construction or manufacturing. Studies have shown that consumer spending on housing and manufactured goods, especially durable goods, tends to be interest sensitive.¹² Spending on services, in contrast, tends to vary little with interest rates. Our analysis

indicates that manufacturing-intensive regions are more responsive to changes in monetary policy than the more industrially diverse regions. This finding suggests that differences in interest-rate sensitivities are one reason for different regional responses. However, we do not find significant evidence that regions dependent on the construction industry have greater responsiveness to monetary policy initiatives.¹³

The analysis also reveals that regions containing a large concentration of small firms tend to be more responsive to monetary policy shifts than regions containing small concentrations of small firms. This finding lends credence to the credit view of monetary policy, although we cannot distinguish between a bank lending channel and a broad credit channel.¹⁴

Finally, we found that a region becomes less sensitive to an increase in the federal funds rate as the percentage of small banks in that region increases. This is inconsistent with the view espoused by Anil Kashyap and Jeremy Stein.¹⁵ One possibility for the inconsistency is

¹³While the finding that monetary policy has larger effects in manufacturing-intensive regions is consistent with a greater interest-rate sensitivity in these areas, it is also consistent with other explanations. For example, contracts fixed in nominal terms are thought to be one avenue by which monetary policy affects economic activity. To the extent that manufacturing firms make greater use of nominal contracts than other firms, it becomes difficult to sort out the true source of the greater policy impact.

¹⁴Earlier we found that while the Rocky Mountain and Southwest regions have high shares of small firms they are less sensitive to changes in monetary policy. The Great Lakes region has a relatively low share of small firms and is most sensitive to changes in monetary policy. The results presented in Appendix B suggest, however, that once we take other factors into account (manufacturing and construction shares and percent of loans made by small banks), the regional concentration of small firms appears to have the anticipated positive effect.

¹⁵If small banks largely make loans to small firms, this relationship would be captured by the small firm variable.

¹¹We found that changes in the fed funds rate have statistically insignificant long-run effects on the level of each region's real income. This finding is consistent with the widely held theoretical view that monetary policy actions have no lasting impact on real variables, such as real income and output.

¹²See Paul Bennett's 1990 article for a survey of relevant studies.

that a bank's asset size may be a poor indicator of its ability to adjust its balance sheet to monetary policy actions.¹⁶

There is a moderate correlation between the small firm variable and the small bank variable used in the analysis described in Appendix B (a simple correlation of .64). This correlation could explain the lack of a positive response of the bank size variable to changes in monetary policy. It does not, however, account for the negative effect.

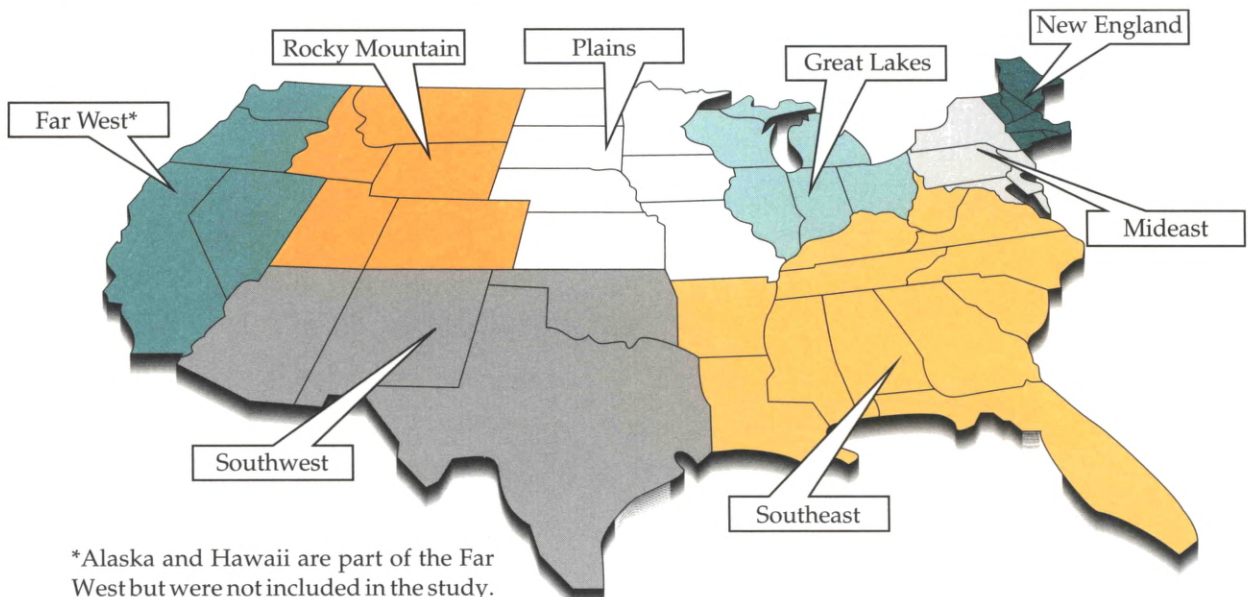
¹⁶Joe Peek and Eric Rosengren suggest that bank capital is a better indicator because better capitalized banks have more and cheaper alternative sources of funds available. In addition, Anil Kashyap and Jeremy Stein point out that regional differences in the types of loans being made might also matter, a factor not controlled for in our study. Another consideration is that the loans variable used in the regression is measured at the end of 1994, which is outside our sample period. We re-estimated the cross-regional model using the percent of total loans made by a region's banks that are at or below the 90th percentile as of the end of 1985. The results using the 1985 loans variable are essentially identical to the reported results using the 1994 variable.

CONCLUSION

Does monetary policy have differential regional effects? The answer is yes. Our research reveals two regions—the Southwest and Rocky Mountain—in which monetary policy has smaller effects on local economic activity than it has on the national economy and one region—the Great Lakes—in which it has a larger effect. The other five, or core, regions respond to monetary policy changes in ways that closely approximate the average response in the United States. The core regions accounted for more than 68 percent of aggregate personal income in the United States in 1980 and for 70 percent of the nation's population.

The existence of disparate responses underscores the complexity of conducting a national monetary policy for countries as large and diverse as the United States. We hope that information from studies such as this will allow regional data to better inform the national policy process.

APPENDIX A Breakdown of Regions



APPENDIX B

The absolute value of the estimated regional cumulative responses reported in the figure on page 23, denoted CR, can be used as dependent variables in a cross-regional regression equation to explain the differential regional responses to monetary policy shocks. An eight-quarter horizon was chosen for the cumulative response because this is generally when Fed policy has its maximum significant cumulative impact. The independent variables in the model are designed to account for the three reasons given to explain why regional responses to monetary policy innovations differ. Unfortunately, the small number of observations (eight regions) limits the number of different reasons that can be considered at the same time. A region's interest-rate sensitivity is measured by the percent of a region's GSP accounted for both by manufacturing (Mfg) and by construction (Con). Two variables are used to account for the regional credit views of monetary policy: the percent of a region's firms that are small (defined as the percent of a region's firms with fewer than 500 employees) (Firms) and the percent of a region's total loans accounted for by a region's banks that are at or below the 90th percentile nationally in assets and not a member of a bank holding company (Loans). The findings from the regression analysis are reported below and discussed in the article (t-statistics are given in parentheses):

$$CR_i = -2.5054 + 0.0856Mfg_i - 0.1649Con_i + 0.0426Firms_i - 0.0305Loans_i$$

(-1.42)
(4.22)
(-1.12)
(2.57)
(-3.02)

$$\bar{R}^2 = 0.8507$$

$$F = 10.97$$

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