

Understanding Urban Decline



ABOUT THE COVER

The burned-out mansion on the cover was built in 1885 for lumber baron Lucien Moore in Brush Park, Detroit's wealthiest neighborhood at the time. Brush Park declined rapidly in the 1930s and 1940s, becoming one of the city's most blighted areas by 1960. But in recent years, developers have begun to renovate some of the neighborhood's grand old homes. The Lucien Moore mansion, for example, was rebuilt in 2006 and retrofitted for apartments in 2012. Economists may debate the merits of various approaches to urban revitalization, but one way or another, the cycle of development and redevelopment usually runs its course.

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ABOUT THE RICHMOND FED

MISSION: As a regional Reserve Bank, we serve the public by fostering the stability, integrity, and efficiency of our nation's monetary, financial, and payments systems.

VISION: To be an innovative policy and services leader for America's economy.

KEY FUNCTIONS: We contribute to the formulation of monetary policy. We supervise and regulate banks and financial holding companies headquartered in the Fifth Federal Reserve District. We process currency and electronic payments for banks and provide financial services to the U.S. Treasury. We also work with a wide variety of partners to strengthen communities in the Fifth District.

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Why the Richmond Fed Studies Urban Issues



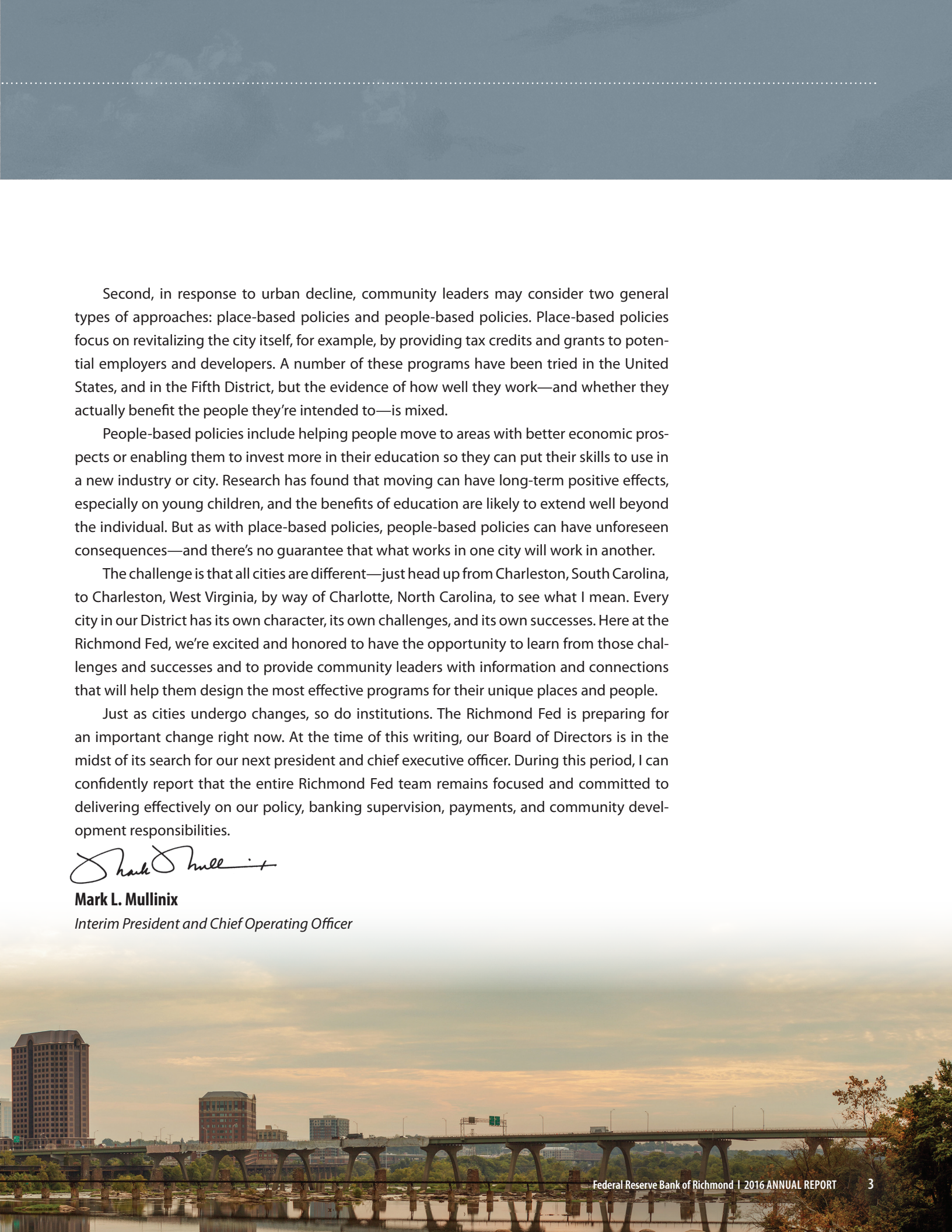
As a regional Reserve Bank, an important part of the Richmond Fed's job is studying what contributes to—or impedes—economic vitality in our region. Metropolitan areas, which are home to the majority of our population and economic activity, are an especially important part of the equation, as Santiago Pinto and Tim Sablik discuss in this year's Annual Report essay, "Understanding Urban Decline." Here in the Fifth District, we have some of the nation's most culturally and economically vibrant cities, but we also have cities suffering persistent decline. And even within areas experiencing rapid growth, there are pockets of deeply entrenched poverty.

Learning about the forces that shape urban areas has been of interest to the Richmond Fed for many years. We recently have focused those efforts, with our Research, Outreach, and Community Development functions joining together to study not just why cities grow, but also why they decline. We're working to measure the consequences of various policy responses and to identify strategies that might help ameliorate urban decline, particularly with respect to housing, income, and transportation. We also are studying the constraints and incentives faced by the low- and moderate-income residents of our District to gain insight into economic mobility and the persistence of poverty. To do so, we're convening academic and policy experts, conducting original research, and engaging with community and business leaders from throughout the region.

Of course, our job is more than studying—it's also sharing what we learn with the people who live and work in our District. That's the goal of this year's essay, in which Santiago and Tim explain the underlying economics of city formation and decline and distill the existing research on urban revitalization efforts. I'll leave the details to the authors, but I would like to highlight some key takeaways.

First, as they note, a city's decline wouldn't necessarily be a cause for concern if the people who lived there were able to easily move to another city with better amenities or employment opportunities. Some people might want to stay in a declining city, for example, to remain close to family or friends, but often there are factors preventing people who would like to move from doing so.





Second, in response to urban decline, community leaders may consider two general types of approaches: place-based policies and people-based policies. Place-based policies focus on revitalizing the city itself, for example, by providing tax credits and grants to potential employers and developers. A number of these programs have been tried in the United States, and in the Fifth District, but the evidence of how well they work—and whether they actually benefit the people they’re intended to—is mixed.

People-based policies include helping people move to areas with better economic prospects or enabling them to invest more in their education so they can put their skills to use in a new industry or city. Research has found that moving can have long-term positive effects, especially on young children, and the benefits of education are likely to extend well beyond the individual. But as with place-based policies, people-based policies can have unforeseen consequences—and there’s no guarantee that what works in one city will work in another.

The challenge is that all cities are different—just head up from Charleston, South Carolina, to Charleston, West Virginia, by way of Charlotte, North Carolina, to see what I mean. Every city in our District has its own character, its own challenges, and its own successes. Here at the Richmond Fed, we’re excited and honored to have the opportunity to learn from those challenges and successes and to provide community leaders with information and connections that will help them design the most effective programs for their unique places and people.

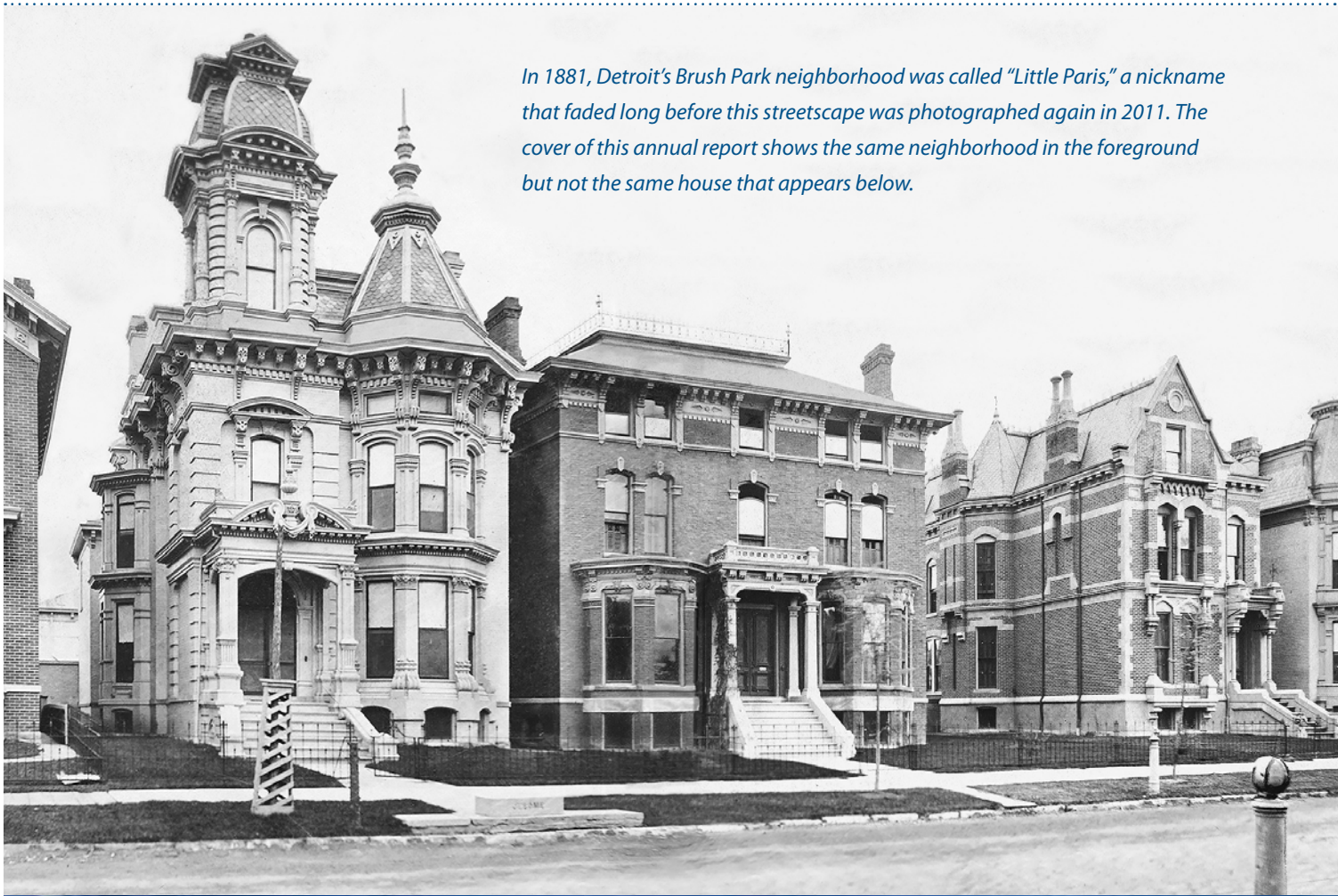
Just as cities undergo changes, so do institutions. The Richmond Fed is preparing for an important change right now. At the time of this writing, our Board of Directors is in the midst of its search for our next president and chief executive officer. During this period, I can confidently report that the entire Richmond Fed team remains focused and committed to delivering effectively on our policy, banking supervision, payments, and community development responsibilities.



Mark L. Mullinix

Interim President and Chief Operating Officer

In 1881, Detroit's Brush Park neighborhood was called "Little Paris," a nickname that faded long before this streetscape was photographed again in 2011. The cover of this annual report shows the same neighborhood in the foreground but not the same house that appears below.



Photos: top ©Burton Historical Collection, Detroit Public Library; bottom ©Michael G. Smith

Understanding Urban Decline

By Santiago Pinto and Tim Sablik

Over the past two centuries, the population of the United States has become increasingly concentrated in cities. In the 1800s, only 6 percent of people lived in urban areas. Today, nearly two-thirds of Americans live in cities, and these cities account for only 3.5 percent of available land in the country.¹ Urbanization also is taking place around the globe. More than half of the world's population lives in cities today, and the World Bank estimates that cities collectively will add another two billion people by 2045.

Not only is population in the United States concentrated in cities, the nation's economic activity is as well. Large cities accounted for roughly 85 percent of the country's gross domestic product (GDP) in 2010.² Concentrating economic activity in this way produces a number of benefits. Places with higher population density exhibit faster growth in productivity and per-capita GDP. Cities are also wellsprings of innovation, accounting for a disproportionate share of new patents.³ Clearly, cities matter.

These benefits make it all the more puzzling that a number of prominent U.S. cities have experienced large population declines in recent decades. St. Louis, Detroit, Cleveland, and Pittsburgh, for example, each lost half or more of their populations between 1950 and 2010. Others, such as Baltimore, Chicago, and Minneapolis suffered smaller, though still substantial, population losses during the same period.

If these changes merely reflected shifts in population from one city to another more desirable or more productive city, there wouldn't necessarily be any cause for concern. However, evidence suggests that urban population outflows have hurt some lower-income people who have been left behind. Declining city centers frequently exhibit high and persistent poverty rates. For instance, in Detroit and Cleveland, 40.3 percent and 36.2 percent of the population, respectively, were below the poverty line in 2015. Meanwhile, the average income of the surrounding suburbs has risen.⁴ In fact, the metropolitan statistical areas (MSAs) surrounding many declining cities have grown in population since 1950. For example, the Detroit and Baltimore MSAs each added more than one million people between 1950 and 2010.⁵ As city centers decline, those people and firms who can leave do, and those who cannot (frequently low-income, low-skilled households) are stuck with dimming economic prospects.

Urban policymakers in declining cities justifiably want to revitalize their cities and help the people who live there. To do so effectively, it is important to first understand what factors determine where people and firms locate, both within and across cities, and what might cause them to move. Second, it is important to understand what policies will be effective at reversing urban decline. The economic benefits that arise from people and firms living



Chicago generally is an exception to the rule that wealthier residents prefer to live outside city centers.

and working together in a city (referred to by economists as agglomeration economies) suggest that even small-scale policy interventions could have outsized effects and potentially improve the welfare of many individuals living in a city, not just the original target group. But as this essay will show, policymakers must carefully consider which interventions will best assist the households they wish to help. The mixed record of any one type of urban revitalization policy suggests that a combination of “place-based” policies (which direct resources to help certain low-income areas) and “people-based” policies (which provide assistance to people regardless of where they live) may be more successful. This essay reviews evidence of the effectiveness of each approach.

Why Do Cities Exist?

In order to examine the effects of different urban policies, it is useful to first understand the benefits that cities provide. Cities arise because there are advantages to concentrating economic activity in one place, known as agglomeration economies. When businesses in the same industry cluster together, they can share inputs, such as tires for cars. The more carmakers that cluster in a region, the more demand they’ll generate for tires in that region, making it more attractive for tire makers to locate in the city as well. That agglomeration reduces costs for all the carmakers. Clustered firms in the same industry also can share a common pool of skilled labor. For example, the high concentration of tech companies in Silicon Valley attracts a lot of software engineers. This is particularly advantageous in the case of industries where any individual firm may experience sudden changes in demand. Workers can transition from shrinking firms to growing ones as demand fluctuates. Finally, firms may benefit from knowledge spillovers. Discovery of new ideas is facilitated by more people living and working in close proximity, and new ideas spread from firms through shared labor pools and supply chains.⁶

At the most basic level, households face a trade-off between land and transportation costs.

The preceding examples describe localization economies—benefits that accrue from clusters of firms in the same industry. But agglomeration benefits also arise from concentrations of different industries. A variety of firms can take advantage of general inputs such as transportation networks or banking and legal services. Many firms employ workers with similar skills, even if they are not in the same industry, and cities provide access to a larger pool of skilled labor. Firms also enjoy knowledge spillovers from businesses in different fields or from other institutions such as universities. These benefits that arise as a result of a diverse city are known as urbanization economies.

Cities also provide a variety of production and consumption benefits to individuals who live there. One striking observation is that all else being equal, it appears that worker productivity and average wages are higher in more densely populated areas.⁷ Economists think these gains come from the fact that the larger the city, the more opportunities workers have to interact with other skilled workers and gain valuable experience that they carry with them throughout their careers.⁸ Concentrations of people also make a variety of amenities, such as restaurants or theaters, commercially viable.

Of course, there are limits and costs to urbanization. Higher population densities come with higher cost of land (rents) as well as more congestion and crime. At some point, these costs will discourage further development.

What Do Cities Look Like?

Agglomeration economies also affect where firms and households locate within a city. When there are benefits from locating close to each other, a variety of different spatial configurations can arise. In other words, agglomeration economies can lead to “multiple equilibria.” This provides insight into why we observe the variety of outcomes across cities that we do. For instance, suppose that firms must decide where to set up their facilities in a context in which they benefit from interacting with each other. These benefits, however, decline with distance. This leads to a city with a central business district (CBD) surrounded by a residential area. Simultaneously, some workers may either decide to live close to work, making the CBD a mixed-use commercial/residential area, or live in the suburbs in an entirely residential area.

At the most basic level, households face a trade-off between land and transportation costs. Living and working in the CBD lowers commuting costs, but at the same time, housing will be more expensive if many people want to live there. Some households might choose to reside in locations that are more distant from the CBD if they are compensated by lower housing prices. In addition to the value of land, housing prices also reflect factors such as the quality of schools, access to parks, crime rates, and levels of environmental quality that make some locations within the city more or less attractive than others. For example, studies show that people are willing to pay more to live in neighborhoods with good schools. Housing prices rise approximately 1 percent to 2 percent when test scores, used to measure school quality, increase by 5 percent. In dollar terms, this amounts to an increase of roughly \$4,000 on average.⁹

In most U.S. cities, wealthier households tend to live farther away from the city center, though there are a few notable exceptions (such as Chicago, Philadelphia, and Washington, D.C.).¹⁰ One explanation for this is that wealthier households prefer to occupy more land and

The main underlying assumption in these models is that residents can move freely within cities, but they balance the various trade-offs in such a way that leaves residents indifferent to moving.

therefore are willing to live in the suburbs despite higher commuting costs because the price of housing per square foot is lower. On the other hand, when a household's income becomes sufficiently large, it may choose to move back to the city center to reduce time spent commuting. This type of trade-off could explain, for instance, why both very poor and very wealthy households are found living in some downtowns. Cities such as Boston, New Orleans, Atlanta, and Philadelphia are examples of this type of spatial pattern. Additionally, public transportation can help explain why poorer households live in the city center. Although the cost of housing per unit of land is higher in the city, public transportation allows poor households that don't have access to cars to economize on transportation costs.¹¹

Transportation may further explain the trend of households moving from city centers to the suburbs, often called suburbanization. Several studies suggest that the development of the highway system contributes to "urban sprawl."¹² One study estimated that just one highway passing through a central city reduces its population by 18 percent.¹³ Cities that experience such a decline in commuting costs do still tend to attract population, but that inflow typically causes the city to expand geographically more than it increases the number of people living in the city center.

Certain amenities, such as schools, also may explain neighborhood sorting by income or race. For instance, as wealthier households move to the suburbs, the quality of schools and other public services provided there will tend to rise. As this process unfolds, lower-income households are left behind in the city center with limited access to high-quality local public services. This has been observed in the suburbanization that has taken place in many large U.S. cities starting around the mid-twentieth century. A prominent recent study, for example, relies on the school desegregation experience to examine how a change in the public school system affected the school choice and localization decisions of residents. The study finds that school desegregation led to a decline in white enrollment in central city public schools in the South, and this decline was linked to white suburban migration. In non-Southern districts, the response was an increase in white private school enrollment.¹⁴ These kinds of forces tend to exacerbate the initial income stratification across locations and help explain why neighborhood differences tend to persist.

To study these various trade-offs, economists rely on models (known in the field as spatial equilibrium models) to examine the economic implications of how households (and/or firms) choose and move to their preferred locations. The main underlying assumption in these models is that residents can move freely within cities, but they balance the various trade-offs in such a way that leaves residents indifferent to moving. (See sidebar on page 9 and appendix on page 17.) Moving to a new neighborhood, for example, might provide the benefits of certain amenities at the cost of more expensive housing or longer commutes. Across cities, different characteristics will be reflected in local wages as well as housing costs. For example, evidence suggests that households would not only be willing to pay higher housing prices to live in more attractive cities, they also would accept lower wages.¹⁵

The basic spatial equilibrium model has implications for how cities might look in a setting where the underlying forces of technology and macroeconomic features are not changing over time. Cities are subject to all manner of dynamic forces, however, that can lead to shifts in urban populations and, in turn, city size and composition.



Modeling Land Use

This diagram shows the land-price gradients for firms, households, and agriculture. The land-price gradients, also referred to as bid-rent functions, represent the maximum price economic agents are willing to pay at each location. Land prices, as indicated by the functions, are highest in the central business district (CBD), which, in this case, is the only employment center, and they decline as people and firms move farther away from the CBD. The negative slopes of the commercial/manufacturing and residential land-price gradients are a consequence of the trade-offs between transportation and land costs when people and firms are deciding where to locate their homes or production facilities. The shape of the residential land-price gradient can be explained as follows. Households commute to work in the CBD and decide where to reside. At a locational equilibrium, households should not have incentives to move. This means that households should obtain the same utility at all locations. Note, however, that residing at more distant locations entails higher commuting costs. For households to be willing to reside farther from the CBD, they will need to be compensated through lower land prices. Firms face similar trade-offs, so the same type of reasoning explains the downward slope of the firms' land-price gradient. A more detailed explanation can be found in the appendix.

The relative slopes of the land-price gradients determine where households and firms locate and how land is used at different locations. We can think about how land is allocated across different uses through a mechanism that works as follows. Suppose that (absentee) landlords own the land, and they rent it, at each location, to whoever offers the highest price through a bidding process. The diagram shows a case in which the firms' land-price gradient is steeper than the residential-price gradient. As a result, firms outbid households at locations closer to the CBD, so land is allocated to commercial or manufacturing uses at those locations, and households outbid firms in the suburbs. The size of the city is determined in this case by the intersection of the residential land-price gradient and the horizontal line indicating agricultural land rent. An urban area arises when land rents for nonagricultural uses at locations closer to the CBD are higher than the agricultural rent. At the urban fringe, rents for nonagricultural and agricultural uses should be equalized. The observed market land rent is determined by the party with the highest willingness to pay at any location. Near the CBD this will be the commercial bid-rent curve until it intersects with the residential bid-rent curve. The residential curve will then determine the price of land until it intersects with the agricultural line.



Sturdy row houses like these in Baltimore often become hotbeds of urban revitalization.

The Lifecycle of Cities

Cities undergo long cycles of development and decay. When a city is new, buildings near the CBD are the most desirable and tend to be occupied by a mix of firms and wealthier households. But as those buildings age and deteriorate, those households may move to newer developments surrounding the city, leaving behind lower-income households. This process can repeat multiple times, pushing the city border outward as higher-income households retreat to the newest ring of development. Eventually, deteriorated buildings in the city center are redeveloped, once again attracting higher-income households back to the city and starting the cycle anew. This has taken place, for instance, in cities such as Chicago and Philadelphia.¹⁶ This process, however, has raised some controversies since transforming a neighborhood from low- to high-income may displace the low-income households who live there, a process called gentrification.

In addition to the natural aging cycle, there may be other forces that contribute to gentrification as well. One view suggests that gentrification is more likely to be observed at locations that border richer neighborhoods.¹⁷ Richer neighborhoods attract more high-income households and expand into adjacent areas that are relatively poor. Another related view states that high-income neighborhoods are characterized by low crime rates that eventually attract additional richer households.¹⁸ Lower-income households are displaced by this sorting.

Because buildings are durable goods, it can take a long time for a city to move through its lifecycle. When a city's population is growing, it is profitable to construct new housing because demand and prices for housing are rising, and the city expands rapidly. But when the population declines, existing housing stock doesn't simply disappear. It can take decades before it is profitable to refurbish or replace a building. The surplus of housing depresses house prices below the cost of construction, and the city stops growing.¹⁹ Moreover, falling rents may draw lower-skilled and lower-income households into the city, intensifying urban sorting by income.

The powerful reinforcing effects of agglomeration economies mean that even small policy changes can trigger large transformations in a city over time.

Cities also experience shocks that alter their composition of firms or people. Cities such as San Francisco, Washington, D.C., New York, and Cleveland, for example, appear to have experienced fairly rapid changes in firm composition without population changes of the same magnitude. Discovery of a new technique by a firm in one city may shift the center of that industry, resulting in an exodus of firms from one city and an influx into another. This leads to sudden growth or decline across cities. Population loss can result as skilled workers follow firms to the new center of that industry.²⁰ Alternatively, employment in a city could decline for other reasons, such as changes in technology leading to greater automation at major employers. This may lead to a city with a thriving CBD but a surrounding residential area that is too large for its current population, as seen in Detroit and other manufacturing cities in the Rust Belt.²¹ Urban policymakers faced with either a sudden shock or a steady decline have a natural inclination to revitalize their cities. But should they intervene? And if so, how?

Justifying Policy Responses to Urban Decline

It is not easy to directly test whether people are genuinely left indifferent about moving—by variation in the prices of housing and amenities—within an urban area, a key prediction of the spatial equilibrium model. (See the appendix on page 17 for more detail.) Nonetheless, there seems to be some evidence that supports this implication. Households do not migrate disproportionately to higher-wage cities, for example. Other factors, such as higher housing prices and/or city amenities and disamenities explain differences in wages across cities. Therefore, variations in wages and housing prices across cities should not be sufficient justification for policy intervention. For instance, high wages may be observed in relatively unattractive cities or in cities with higher housing prices.²²

On the other hand, if households face hurdles to moving, policymakers may be able to help people who are “trapped” in declining areas. Often, higher-skilled and higher-income households can more easily move when a neighborhood declines, while poorer and lower-skilled individuals are left behind. Artificial barriers, such as zoning laws or minimum lot sizes, make the process of moving to thriving communities even more difficult. To the extent that such mismatch exists, policy actions to alleviate these frictions could be welfare-improving.

The spatial equilibrium model also provides two justifications for the implementation of policies aimed at revitalizing a declining city.²³ The powerful reinforcing effects of agglomeration economies mean that even small policy changes can trigger large transformations in a city over time, providing an argument in favor of promoting urban renewal. Higher concentrations of people and firms have, on balance, positive effects on almost everyone living in a city. Higher population density means greater learning and sharing of knowledge, more productive firms and workers, and more efficient supply lines and labor matching. Thus, investments may well “jumpstart” these forces in ways that could have benefits that clearly outweigh their costs. In theory, even an announcement that a neighborhood will be revitalized could by itself trigger a variety of positive effects before the government spends any money.²⁴

As noted earlier, agglomeration effects create the possibility of multiple equilibria for a city when they are sufficiently strong. In this case, efforts to “push” a city from a low-employment/low-wage equilibrium (poverty trap) to a high-employment/high-wage equilibrium could be worthwhile. In practice, however, there is little evidence of cities that have moved

from one equilibrium to another. One study looked at the extreme case of the Japanese cities Hiroshima and Nagasaki, which were entirely destroyed in World War II. Following the war, they were rebuilt and returned to their long-run population trends, suggesting that a city's spatial configuration is both unique and stable.²⁵

If policymakers decide that some intervention is warranted, there are a number of different approaches they could consider. One option is to focus on helping households by giving them the tools to improve their situation. This could involve removing barriers that prevent households from relocating to thriving parts of the city, providing housing vouchers to help them move, or improving transportation networks to reduce commuting costs. An alternative approach is to focus on revitalizing the city itself. This includes revitalizing residential or commercial buildings that have declined or offering incentives to employers to locate in the city and hire local people. Economists have labeled these different approaches people-based and place-based policies, respectively.

The ultimate goal of either approach is, presumably, to help people. One of the key responsibilities of policymakers is to consider how effective any given policy might be at achieving that goal. Additionally, the presence of agglomeration economies and social interactions tend to magnify the impact of policies in the context of cities and could, potentially, end up benefitting everyone in the city. However, it remains a challenge to precisely identify and implement those policies that fully exploit and take advantage of the external effects that characterize urban areas.

Revitalizing Places

Enterprise Zones (EZs) are one of the most widely used, and widely studied, forms of place-based policy intervention. EZs designate an area for assistance, typically in the form of tax credits for employers and grants for various development projects. EZs have been implemented on both the state and federal level. Connecticut established the first state-based EZ in 1982, and forty states had some type of EZ by 2008. On the federal level, Empowerment Zones (which are similar to EZs on the state level) were used from 1993 to around 2009.²⁶ Under this program, local governments could apply to the Department of Housing and Urban Development for benefits similar to state EZs. Eleven cities were selected for Empowerment Zones in the first phase of the program, including Atlanta, Baltimore, Chicago, Detroit, New York, and Philadelphia.²⁷

Investment in these various programs has been substantial, but measuring their impact has been challenging. One problem is that targeted areas often don't align neatly with census tracts, zip codes, or other standard geographical boundaries used for collecting data. Another challenge is controlling for other factors that influence local economic conditions and finding appropriate control cases for comparison. A third difficulty is that any benefits attributed to place-based interventions may come at a cost to other regions. For example, persuading a business to relocate from one city to another city benefits the latter at the expense of the former. On the other hand, promoting development in one part of the city may spur private investment that benefits nearby, nontargeted areas. Any empirical study looking to measure the benefits of these programs must account for these positive and negative spillover effects.



Hiroshima was totally destroyed during World War II, but the city eventually returned to its long-run population trend.

Given these challenges, it is not surprising that studies have found mixed effects from state and federal EZ programs. At the state level, an examination of California’s EZ program found no evidence of a significant impact on employment, while an analysis of Texas’ EZs found a positive effect, particularly in lower-paying industries.²⁸ At the federal level, some studies have found positive, statistically significant effects on employment and wages from Empowerment Zones.²⁹ On the other hand, there is also evidence of significantly negative spillover effects on areas geographically near or economically similar to Empowerment Zones, suggesting that at least some of the “gains” may simply be shifted economic activity.³⁰ Whether these programs actually help their intended recipients is also controversial. While more recent EZs require employers to hire locally in order to receive the benefits, not all programs have had this stipulation, meaning some benefits may have accrued to workers who moved to the city with firms rather than to the original target group of individuals.

Other place-based urban policies focus on improving residential buildings and infrastructure. Examples of federal urban renewal programs include the Housing Act of 1949, which provided loans to cities to acquire and redevelop decaying neighborhoods, and the Model Cities Program of the 1960s, which focused more on renewal of neighborhoods rather than wholesale reconstruction. Evidence on the impact of these projects is also inconclusive. Studies don’t suggest they had a meaningful impact on population growth or per-capita income, but that may be due to their relatively limited funding.³¹ Urban renewal projects do seem to generate higher land values—even in nearby neighborhoods not directly targeted, as found in one study of the Neighborhoods-in-Bloom program in Richmond, Virginia.³² One of the main findings of that study is that after accounting for all the external effects generated by this kind of program, the overall benefits may more than compensate for the costs of implementation.

To the extent that urban renewal programs generate higher land values, many of the benefits may accrue to landowners rather than low-income households if those households are mostly renters. For example, one study of the federal Empowerment Zone program found that it had no effect on poverty and employment for residents but a large effect on property prices.³³ Successful urban renewal projects also may end up displacing those households if neighborhoods become more desirable because of new construction.³⁴ An influx of



Photo: ©SuperStock/GettyImages

When Pittsburgh's population peaked in the 1950s, the city's economy relied heavily on the steel industry.

higher-income households may bid up rents and price out the low-income households the renewal projects were intended to help, raising the problem of gentrification described earlier. Policymakers undertaking a place-based approach to reversing urban decline should be mindful of unintended consequences such as these.

Investing in People

Another criticism of urban renewal programs is that they encourage households to remain in neighborhoods with few opportunities. That is, those areas may have declined for a reason, and applying a fresh coat of paint may merely address the symptoms and not the causes of decline. Enticing firms to locate in those areas through EZs could solve this problem, but only if the firms seek the skills possessed by households living in those areas. In light of these challenges, some economists have said that the best thing households in declining city neighborhoods can do is move.³⁵ And to the extent that they are constrained from leaving, policymakers should help them.

In the mid-1990s, the U.S. Department of Housing and Urban Development took this approach with the Moving to Opportunity (MTO) program. The program was implemented in five cities—Baltimore, Boston, Chicago, Los Angeles, and New York—and it provided housing vouchers to families living in high-poverty neighborhoods to help them move to low-poverty neighborhoods. While participation in the program was voluntary, the eligible applicants who received vouchers were chosen randomly, making it a good case study of this policy approach. Some households (the treatment group) received housing vouchers that could only be used in census tracts with poverty rates below 10 percent; others received vouchers with no geographical restrictions (Section 8 vouchers); and the control group received no vouchers and continued receiving public assistance.

Some research has found that for adults, the program seems to have had no lasting effect on earnings or economic self-sufficiency.³⁶ Moreover, of the households offered a voucher to move to lower-poverty neighborhoods, less than half accepted, and some that did move later moved back.³⁷ For children, the evidence was mixed. Those who were younger than thirteen when they moved to a lower-poverty area seemed to benefit. Compared with children in the control group, they had incomes that were about \$3,500 (31 percent) higher on average in their mid-twenties, were more likely to attend college, and were less likely to become single parents. On the other hand, children who were older than thirteen when they moved suffered



worse long-term outcomes, possibly because they already had established social networks in their old neighborhoods and disrupting those networks caused more harm than good.³⁸

More recent research examines the outcomes of similar housing voucher programs and finds more favorable evidence of this type of policy. From a research standpoint, the fact that participation in the MTO experiment and the use of the housing vouchers was voluntary introduces potential self-selection bias into the results of the experiment. Some children could have benefitted from the relocation to a low-poverty neighborhood, but since their parents were not really motivated to move, they did not participate in the program. To overcome this problem, one study focuses on the outcomes of a specific program that involved the mandatory relocation of households to other neighborhoods because the public housing where they lived was set to be demolished. This study concludes that the relocation of households had large and positive effects on children (they were more likely to be employed and earned higher wages as adults), and these effects were substantially larger than those found in the MTO experiment. This suggests that the children who did not participate in the MTO experiment were very likely those who could have benefitted most.³⁹

Rather than attempting to move residents to more prosperous areas, another people-based approach is to improve residents' human capital. Certainly investing in education and human capital has benefits on the individual level. But having a more educated, more productive urban population has positive spillover effects on the city as a whole, too. In fact, these spillover effects seem to play a key role in defining modern successful cities. In the early post-World War II era, city growth was tied to high concentrations of physical capital, like the car factories of Detroit or the steel mills of Pittsburgh. But since 1980, human capital has become a more reliable indicator of a thriving city. Average wages in cities with highly educated populations, such as Boston or San Francisco, are much higher for both college graduates and high school graduates than in cities with low levels of college education.⁴⁰

There may be other spillover benefits as well. Individuals with more education are significantly less likely to commit crimes. Thus, increasing high school graduation rates (for men in particular) seems to provide substantial social savings to cities in the form of less crime.⁴¹ Raising human capital levels and the number of high-skilled jobs in a city also has a multiplier effect. One study found that for each new job in an innovative field added to a city, five additional jobs were created. This includes high-skilled jobs (such as lawyers, teachers, or nurses), and low-skilled jobs (such as waiters, baristas, or taxi drivers).⁴²

Pittsburgh's population is less than half what it was in the 1950s, but the city's economy is more diversified.

When considering policies, something to bear in mind is that cities are far from identical. The forces that gave rise to the movie industry in Los Angeles or the auto industry in Detroit may not be replicable elsewhere.

Cities with higher levels of human capital also tend to attract more individuals with high levels of human capital, creating clusters of innovation, such as Silicon Valley near San Jose, California, or the Research Triangle in Raleigh, Durham, and Chapel Hill, North Carolina. What is less certain is whether policymakers in declining cities can create new innovation clusters by investing in universities or other research institutions. Empirical evidence does suggest that such investments could have lasting benefits for a city, but many of these studies examine the effects of well-established universities on a region. It is more difficult to say for certain what leads individuals and firms to cluster around certain institutions and not others, and it is unclear whether attempting to create such clusters out of whole cloth would succeed. Moreover, the greater mobility of highly educated individuals may reduce the ability of cities to fully benefit from investments in human capital. If a declining city doesn't already have an innovative sector to employ newly trained individuals, those individuals may choose to leave the city after completing their education, taking their human capital with them.

Taking a Balanced Approach

The urban economics literature has much to say about our increasingly urban world. First, agglomeration economies are powerful forces that have led to the dramatic urbanization of the world's population over the past two centuries. These forces have fed into each other to generate remarkable economic growth. These feedback effects mean that even small changes to a city can have a large impact over the long run. Urban policies are often thought of in terms of large-scale projects: building a new sports complex or business center, redeveloping whole neighborhoods, or adding new public transportation infrastructure. But spatial models of cities suggest that small-scale projects could be just as effective at promoting city growth.

Creating growth through new industries may be more challenging than maintaining or restoring existing industries in a city, however. Because agglomeration economies arise organically, it is hard to say what incentives could attract new firms to locations they previously avoided.⁴³ When considering policies, something to bear in mind is that cities are far from identical. The forces that gave rise to the movie industry in Los Angeles or the auto industry in Detroit may not be replicable elsewhere. Moreover, policies that generated a positive response in one city have no guarantee of doing the same in another. As the studies we've highlighted illustrate, policies implemented in the complex social environment of cities may trigger all sorts of unanticipated responses. This doesn't mean that policymakers can draw no lessons from experiments in other cities, but the key lesson is to proceed with caution.

Finally, while this essay has presented examples of both place-based and people-based policies, these should not be viewed as mutually exclusive. There may be practical limitations to how far city leaders can take any one approach. Emptying out a declining neighborhood may seem like the efficient choice in an economic model, for example, but it may not be a realistic solution. Rather, policymakers should consider a mix of responses that would be most appropriate for their respective cities. Two main questions should guide their choices. First, are there policies that, in the spatial context of cities, can potentially improve the well-being of nearly all residents? Second, to what extent do more targeted policies help their intended recipients? ■

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Basic Urban Equilibrium

Location decisions of households

Consider a linear city, where identical households commute between their place of residence and place of work, the central business district (CBD). The distance from a household's residence to the CBD is x (the CBD is located at $x = 0$). The commuting cost per mile is denoted by t , which is assumed constant. Total commuting costs for a consumer residing x miles from the CBD is tx . All households earn an exogenously given income w . Disposable income for a household residing x miles from the CBD is $w - tx$. Households consume two goods: a nonhousing good, c , and land, denoted by ℓ . The simplest version of the model assumes that residential consumption of land is given and equal to one, i.e., $\ell = 1$, and preferences are represented by the utility function $v(c) = c$. The price of the nonhousing good is equal at all locations and it is normalized to one, and land can be rented at r per acre. The budget constraint is $w - tx = c + r$. Households are perfectly mobile within an urban area (and across cities), which implies that at a locational equilibrium all households achieve the same level of utility. In our model, this means that $u = w - tx - r$ for all x , where u is taken as exogenous. From this equilibrium condition, we obtain the land-price gradient $r \equiv r(x, w, t, u) = w - tx - u$. The latter is usually referred to as the residential land bid-rent function since it actually represents the maximum rent a household is willing to pay for land at different locations. Note that $\partial r / \partial x = -t < 0$, so that residential land rent declines as distance from the CBD increases. This condition has the following interpretation. As households move one mile farther away from the CBD, commuting costs increase by t . Households would be indifferent between staying and moving to the new location if the decline in land rents fully compensate for the additional commuting costs.

Location decisions of firms

Suppose that each firm produces a fixed amount of output q employing one unit of land and structure capital. The price of q , denoted by p , and the cost of structure, denoted by C , are given and do not change with x . Firms pay the land rent r_f , where r_f changes with x . Firms can set up their production facilities at any location x . However, the products have to be taken to the port or transportation terminal, located at the CBD, for delivery to their final destinations. The cost of transporting one unit of q per mile is t_q , so total transportation costs to the CBD for a firm located at x are $t_q x q$. Profits at location x are consequently given by $\pi = pq - C - t_q x q - r_f$. Perfect competition and free entry of firms drive profits to zero at every location, so the highest land rent a firm is willing to pay at x is:

$r_f \equiv r_f(x, p, q, C, t_q) = (p - t_q x)q - C$. The slope of the firm's bid rent is $\partial r_f / \partial x = -t_q q$.

Land use and equilibrium city size

Land can be rented to firms, households, or used for agriculture. Agricultural land rent is given by r_A . Absentee landlords rent the land to whoever is willing to offer the highest bid. The relative slopes of the bid-rent functions, as a result, determine how the land is used. The diagram on page 9 shows a situation in which the slope of the firms' bid-rent function is steeper than the slope of the residential bid-rent function, i.e., $t_q/q > t$. The two curves intersect at $x = \bar{x}$, which defines the border between firms and households. The size of the city in the diagram is given by the distance from the CBD to the city-rural boundary, denoted by $\bar{x}$, and it is determined by the intersection of the residential bid-rent function and the horizontal line r_A . As a result, all locations $x < \bar{x}$ are occupied by firms, all locations $\bar{x} \leq x \leq \bar{x}$ are occupied by households, and all locations $x > \bar{x}$ are devoted to the agricultural use. Specifically, the city size $\bar{x}$ is determined by

$$r(\bar{x}, w, t, u) = r_A \quad (1)$$

Also, in equilibrium, the city's population, N , should fit in the city, or

$$\int_0^{\bar{x}} dx = N. \quad (2)$$

Consider a situation in which there is costless migration across cities (usually referred to as an "open city model"), so the city's population adjusts until utility is equalized everywhere at utility level u . Substituting $r(x, w, t, u)$ into (1) and solving for $\bar{x}$, it follows that $\bar{x} = (w - u - r_A)/t$, and from (2), $N = \bar{x}^2/2$. Note that since $r(x, w, t, u) - r(\bar{x}, w, t, u) = t(\bar{x} - x)$, then the equilibrium residential bid-rent function is

$$r(x, w, t, u) = r_A + t(\bar{x} - x).$$

Endnotes

- ¹ Cohen (2015).
- ² Manyika et al. (2012).
- ³ Moretti (2013, 84) and Jaffe, Trajtenberg, and Henderson (1993).
- ⁴ More recently in the 2000s, following the nationwide trend, poverty has been rising in the suburbs as well. However, poverty is still a phenomenon highly concentrated in inner cities.
- ⁵ The Census Bureau began tracking “standard metropolitan areas” with the 1950 census. These were later renamed MSAs, and the boundaries have changed over the decades following the fluctuations of cities. Data are from the 1950 Census and 2010 Census.
- ⁶ Audretsch and Feldman (1996) and Glaeser (1999).
- ⁷ Moretti (2004).
- ⁸ De la Roca and Puga (2016).
- ⁹ Black (1999) and Bayer, Ferreira, and McMillan (2007).
- ¹⁰ Rosenthal and Ross (2015).
- ¹¹ Glaeser, Kahn, and Rappaport (2008).
- ¹² Baum-Snow (2007) and Duranton and Turner (2012).
- ¹³ Baum-Snow (2007).
- ¹⁴ Baum-Snow and Lutz (2011). Other studies focus on different explanations for “white flight,” such as rising crime rates in cities. See Cullen and Levitt (1999) and Boustan (2010).
- ¹⁵ Glaeser, Kolko, Saiz (2001) and Albouy (2012).
- ¹⁶ Brueckner and Rosenthal (2009).
- ¹⁷ Guerrieri, Hartley, and Hurst (2013).
- ¹⁸ O’Sullivan (2005).
- ¹⁹ Glaeser and Gyourko (2005).
- ²⁰ Duranton (2007).
- ²¹ Owens, Rossi-Hansberg, and Sarte (2017).
- ²² Glaeser and Gottlieb (2008).
- ²³ Kline and Moretti (2013).
- ²⁴ Kline and Moretti (2014).
- ²⁵ Davis and Weinstein (2002).
- ²⁶ The Empowerment Zone designation generally expired in 2009, though it was subject to a series of case-by-case extensions.
- ²⁷ Ham, Swenson, Imrohoroglu, and Song (2011).
- ²⁸ Neumark and Kolko (2010) and Freedman (2013).
- ²⁹ Busso, Gregory, and Kline (2013) and Ham, Swenson, Imrohoroglu, and Song (2011).
- ³⁰ Hanson and Rohlin (2013).
- ³¹ Glaeser and Gottlieb (2008).
- ³² Rossi-Hansberg, Sarte, and Owens (2010).
- ³³ Hanson (2009).
- ³⁴ Several studies show that EZ programs could have generated demographic changes in affected neighborhoods. Neumark and Simpson (2015).
- ³⁵ Glaeser (2005).
- ³⁶ Kling, Liebman, and Katz (2007).
- ³⁷ Clampet-Lundquist and Massey (2008).
- ³⁸ Chetty, Hendren, and Katz (2016).
- ³⁹ Chyn (2016).
- ⁴⁰ Moretti (2004) and Moretti (2011).
- ⁴¹ Lochner and Moretti (2004).
- ⁴² Moretti (2013).
- ⁴³ Rosenthal and Strange (2006).

References

- Albouy, David. May 2012. "Are Big Cities Bad Places to Live? Estimating Quality of Life across Metropolitan Areas." Working paper.
- Audretsch, David B., and Maryann P. Feldman. June 1996. "R&D Spillovers and the Geography of Innovation and Production." *American Economic Review* 86 (3): 630–640.
- Baum-Snow, Nathaniel. May 2007. "Did Highways Cause Suburbanization?" *Quarterly Journal of Economics* 122 (2): 775–805.
- Baum-Snow, Nathaniel, and Byron F. Lutz. December 2011. "School Desegregation, School Choice, and Changes in Residential Location Patterns by Race." *American Economic Review* 101 (7): 3019–3046.
- Bayer, Patrick, Fernando Ferreira, and Robert McMillan. August 2007. "A Unified Framework for Measuring Preferences for Schools and Neighborhoods." *Journal of Political Economy* 115 (4): 588–638.
- Black, Sandra E. May 1999. "Do Better Schools Matter? Parental Valuation of Elementary Education." *Quarterly Journal of Economics* 114 (2): 577–599.
- Boustan, Leah Platt. February 2010. "Was Postwar Suburbanization 'White Flight'? Evidence from the Black Migration." *Quarterly Journal of Economics* 125 (1): 417–443.
- Brueckner, Jan K., and Stuart S. Rosenthal. November 2009. "Gentrification and Neighborhood Housing Cycles: Will America's Future Downtowns Be Rich?" *Review of Economics and Statistics*, 91 (4): 725–743.
- Busso, Matias, Jesse Gregory, and Patrick Kline. April 2013. "Assessing the Incidence and Efficiency of a Prominent Place Based Policy." *American Economic Review* 103 (2): 897–947.
- Chetty, Raj, Nathaniel Hendren, and Lawrence F. Katz. April 2016. "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment." *American Economic Review* 106 (4): 855–902.
- Chyn, Erik. October 2016. "Moved to Opportunity: The Long-Run Effect of Public Housing Demolition on Labor Market Outcomes of Children." Working paper.
- Clampet-Lundquist, Susan, and Douglas S. Massey. July 2008. "Neighborhood Effects on Economic Self-Sufficiency: A Reconsideration of the Moving to Opportunities Experiment." *American Journal of Sociology* 114 (1): 107–143.
- Cohen, Darryl T. March 2015. "Population Trends in Incorporated Places: 2000 to 2013." United States Census Bureau Report P25–1142.
- Cullen, Julie Berry, and Steven D. Levitt. May 1999. "Crime, Urban Flight, and the Consequences for Cities." *Review of Economics and Statistics* 81 (2): 159–169.
- Davis, Donald R., and David E. Weinstein. December 2002. "Bones, Bombs, and Break Points: The Geography of Economic Activity." *American Economic Review* 92 (5): 1269–1289.
- De la Roca, Jorge, and Diego Puga. July 2016. "Learning by Working in Big Cities." *Review of Economic Studies* 84 (1): 106–142.
- Duranton, Gilles. March 2007. "Urban Evolutions: The Fast, the Slow, and the Still." *American Economic Review* 97 (1): 197–221.
- Duranton, Gilles, and Matthew A. Turner. October 2012. "Urban Growth and Transportation." *Review of Economic Studies* 79 (4): 1407–1440.
- Freedman, Matthew. Spring 2013. "Targeted Business Incentives and Local Labor Markets." *Journal of Human Resources* 48 (2): 311–344.
- Glaeser, Edward L. September 1999. "Learning in Cities." *Journal of Urban Economics* 46 (2): 254–277.
- Glaeser, Edward L. September 2005. "Should the Government Rebuild New Orleans, Or Just Give Residents Checks?" *The Economists' Voice* 2 (4): 1–6.
- Glaeser, Edward L., and Joshua D. Gottlieb. October 2008. "The Economics of Place-Making Policies." National Bureau of Economic Research Working Paper No. 14373.
- Glaeser, Edward L., and Joseph Gyourko. April 2005. "Urban Decline and Durable Housing." *Journal of Political Economy* 113 (2): 345–375.

References

- Glaeser, Edward L., Matthew E. Kahn, and Jordan Rappaport. January 2008. "Why Do the Poor Live in Cities? The Role of Public Transportation." *Journal of Urban Economics* 63 (1): 1–24.
- Glaeser, Edward L., Jed Kolko, and Albert Saiz. January 2001. "Consumer City." *Journal of Economic Geography* 1 (1): 27–50.
- Guerrieri, Veronica, Daniel Hartley, and Erik Hurst. April 2013. "Endogenous Gentrification and Housing Price Dynamics." *Journal of Public Economics* 100: 45–60.
- Ham, John C., Charles Swenson, Ayşe Imrohoroglu, and Heonjae Song. August 2011. "Government Programs Can Improve Local Labor Markets: Evidence from State Enterprise Zones, Federal Empowerment Zones and Federal Enterprise Community." *Journal of Public Economics* 95 (7–8): 779–797.
- Hanson, Andrew. November 2009. "Local Employment, Poverty, and Property Value Effects of Geographically-Targeted Tax Incentives: An Instrumental Variables Approach." *Regional Science and Urban Economics* 39 (6): 721–731.
- Hanson, Andrew, and Shawn Rohlin. January 2013. "Do Spatially Targeted Redevelopment Programs Spillover?" *Regional Science and Urban Economics* 43 (1): 86–100.
- Jaffe, Adam B., Manuel Trajtenberg, and Rebecca Henderson. August 1993. "Geographic Localization of Knowledge Spillovers as Evidenced by Patent Citations." *Quarterly Journal of Economics* 108 (3): 577–598.
- Kline, Patrick, and Enrico Moretti. November 2013. "Local Economic Development, Agglomeration Economies, and the Big Push: 100 Years of Evidence from the Tennessee Valley Authority." *Quarterly Journal of Economics* 129 (1): 275–331.
- Kline, Patrick, and Enrico Moretti. August 2014. "People, Places, and Public Policy: Some Simple Welfare Economics of Local Economic Development Programs." *Annual Review of Economics* 6: 629–662.
- Kling, Jeffrey R., Jeffrey B. Liebman, and Lawrence F. Katz. January 2007. "Experimental Analysis of Neighborhood Effects." *Econometrica* 75 (1): 83–119.
- Lochner, Lance, and Enrico Moretti. March 2004. "The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-Reports." *American Economic Review* 94 (1): 155–189.
- Manyika, James, Jaana Remes, Richard Dobbs, Javier Orellana, and Fabian Schaer. April 2012. "Urban America: U.S. Cities in the Global Economy." McKinsey Global Institute.
- Moretti, Enrico. 2004. "Human Capital Externalities in Cities." *Handbook of Regional and Urban Economics* 4: 2243–2291.
- Moretti, Enrico. 2011. "Local Labor Markets." *Handbook of Labor Economics* 4b: 1237–1313.
- Moretti, Enrico. 2013. *The New Geography of Jobs*. New York: Mariner Books.
- Neumark, David, and Jed Kolko. July 2010. "Do Enterprise Zones Create Jobs? Evidence from California's Enterprise Zone Program." *Journal of Urban Economics* 68 (1): 1–19.
- Neumark, David, and Helen Simpson. 2015. "Place-Based Policies." *Handbook of Regional and Urban Economics* 5: 1197–1287.
- O'Sullivan, Arthur. January 2005. "Gentrification and Crime." *Journal of Urban Economics* 57 (1): 73–85.
- Owens, Raymond III, Esteban Rossi-Hansberg, and Pierre-Daniel Sarte. February 2017. "Rethinking Detroit." National Bureau of Economic Research Working Paper No. 23146.
- Rosenthal, Stuart S., and Stephen L. Ross. 2015. "Change and Persistence in the Economic Status of Neighborhoods and Cities." *Handbook of Regional and Urban Economics* 5: 1047–1120.
- Rosenthal, Stuart S., and William C. Strange. 2006. "The Micro-Empirics of Agglomeration Economies." In *A Companion to Urban Economics*, edited by Richard J. Arnott and Daniel P. McMillen, 7–23. Oxford, U.K.: Blackwell Publishing.
- Rossi-Hansberg, Esteban, Pierre-Daniel Sarte, and Raymond Owens III. June 2010. "Housing Externalities." *Journal of Political Economy* 118 (3): 485–535.

Fifth District Economic Report

Fifth District Economy Grew Moderately in 2016

Ancedotal reports and economic data on the Fifth District in 2016 revealed a regional economy that continued to grow throughout the year. Employment rose at a moderate pace with more robust growth coming out of North and South Carolina. Wage growth picked up overall, including, according to survey responses, for starting wages across a number of firms. Services firms generally reported expanding activity throughout the year, while manufacturers began the year with less universally positive reports and ended the year on somewhat more optimistic notes. Real estate markets continued to improve in 2016, but real estate professionals expressed concerns about regulatory delays and shortages of buildable lots and skilled workers.

Labor Markets

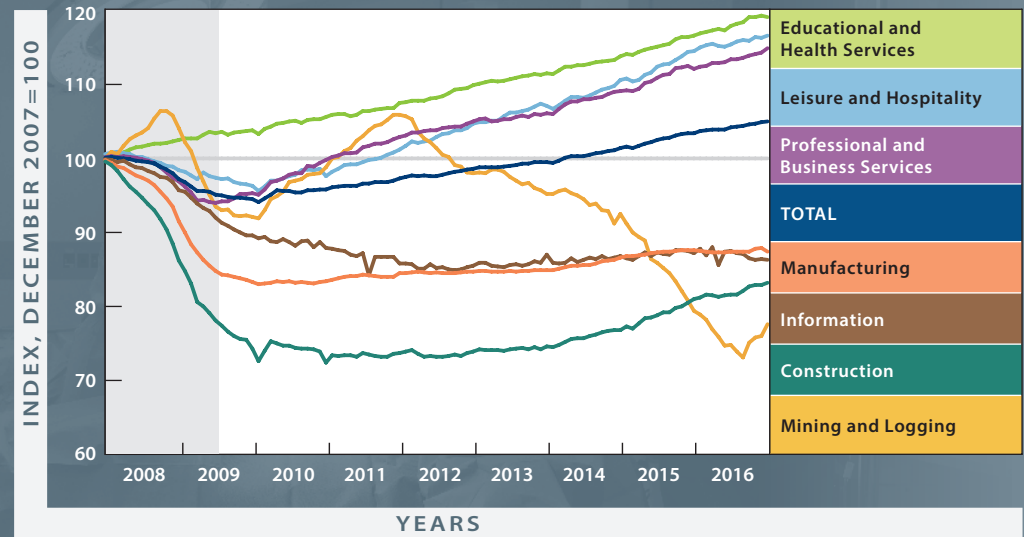
Labor market conditions continued to tighten over the course of 2016. Payroll employment expanded 1.4 percent in the Fifth District as employers added 201,800 jobs. Among the District's jurisdictions, North Carolina posted the largest year-over-year growth rate in December of 2.2 percent, followed by South Carolina's 1.8 percent. The Carolinas were the only Fifth District states to outpace the national rate of 1.6 percent. Employment grew in the other Fifth District jurisdictions except for West Virginia, which reported a 0.8 percent decline as the state continued to shed a large number of jobs from the mining and logging sector.

In the District overall, the most jobs were added over the year to education and health services (50,200 jobs) followed by trade, transportation, and utilities (35,200 jobs) and professional and business services (35,000 jobs). The only industry to lose jobs in 2016 was information, which shed 3,100 jobs (1.3 percent); information is the smallest industry in the District, and employment in the sector has generally been declining or flat since 2000.

Although construction employment grew in 2016 and has been growing at a healthy pace since the beginning of 2014, total employment in the industry has not returned to its prerecession level. (See Figure 1.) In fact, in December 2016 the industry's total employment stood at 82.9 percent of the level reported in December 2007. Similarly, employment in the manufacturing and information industries has yet to return to prerecession levels. Employment in mining and logging had returned to its prerecession levels, but the industry began to shed jobs again in 2012 and is now below its December 2007 level. Employment in mining has fluctuated, primarily in response to changes in coal and natural gas markets.

Despite the fact that a few industries still have not returned to their prerecession employment levels, employment in the District as a whole exceeded its December 2007 level in April 2014 and has remained above that level. Moreover, the professional and business services and leisure and hospitality industries surpassed their prerecession marks in 2011.

Figure 1: Fifth District Employment Growth by Industry



SOURCE: Current Employment Statistics, Bureau of Labor Statistics

NOTES: Gray area indicates the recession. Industries that closely followed the overall growth trend (the total line) have been omitted from this graph. They are: trade, transportation, and utilities; financial activities; and other services. Government employment growth also is not shown because it was essentially flat.

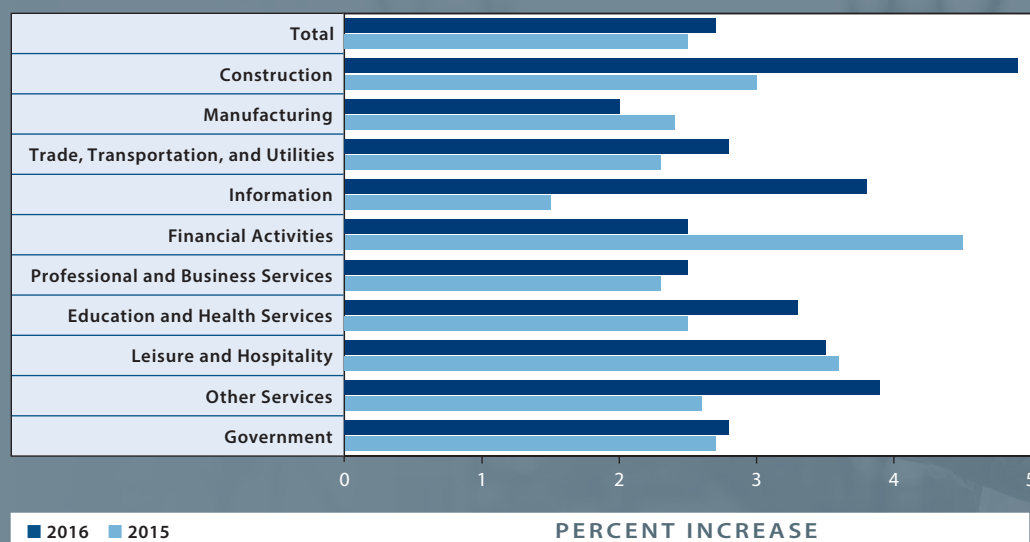
The education and health services industry and the government sector were the only two categories that did not decline either during or since the recession.

In 2016, the unemployment rate in the Fifth District declined from 5.0 percent in December 2015 to 4.6 percent in December 2016—the lowest rate since early 2008. All of that 2016 improvement came in the first half of the year; the rate has remained at 4.6 percent since June. At the jurisdiction level, unemployment rates declined in every state except Virginia, where the 4.1 percent rate in December 2016 matched the rate reported in December of the previous year. The greatest improvement came from South Carolina, where the jobless rate declined 1.2 percentage points to end the year at 4.3 percent.

Anecdotes throughout the Fifth District indicated that as the labor market tightened in 2016, employers increasingly struggled to find skilled workers. In particular, there were consistent reports of challenges in finding tradespeople, construction workers, hospitality workers, and IT professionals. Anecdotal information also suggested that the tight labor market might be driving up starting wages. According to a survey of employers conducted by the Federal Reserve Bank of Richmond in May 2016, more than 60 percent of respondents said they were raising starting wages. The same result was obtained when the survey was repeated in November 2016. Furthermore, the number of respondents who reported raising wages for “most” jobs (as opposed to “some” jobs) was higher in November than in May.

Data on wage growth from the Bureau of Labor Statistics supported the anecdotal information. Using the most recent data from the bureau’s Quarterly Census of Employment and Wages, Figure 2 shows that Fifth District wage growth over the trailing four quarters through September 2016 slightly outpaced the same four quarters of the prior year. Additionally,

Figure 2: Year-over-Year Wage Growth in the Fifth District



SOURCE: Richmond Fed calculations using Quarterly Census of Employment and Wages, Bureau of Labor Statistics
 NOTES: Calculations are based on nominal average wages from the trailing four quarters through September of 2014, 2015, and 2016. Calculations for manufacturing and construction do not include data from the District of Columbia. For the trailing four months ending September 30, 2016, the District of Columbia accounted for 2.1 percent of construction employment and 0.1 percent of manufacturing employment in the Fifth District.

the largest wage growth came from the construction industry (4.9 percent), which was also the industry with the most persistent reports of difficulties in finding workers. Wage growth accelerated in most other industries as well, with the most notable deceleration coming in the financial services industry.

Business Conditions

Manufacturing activity was mixed in 2016, but it ended on a generally optimistic note. The Richmond Fed maintains a composite manufacturing index based on the Bank's *Fifth District Survey of Manufacturing Activity*. It is a diffusion index, meaning that a positive reading indicates that the share of firms reporting expansion exceeds the share of firms reporting contraction. As was the case last year, the index fluctuated between positive and negative readings throughout the year; however, 2016 ended with two consecutive months of positive index values and included more comments expressing optimism.

Throughout the year, anecdotal reports indicated that some segments of manufacturing were more consistently positive. For example, manufacturers of automobiles, auto parts, and aerospace products reported growth, fairly robust at times, for most of the year. Conversely, some manufacturers continued to be adversely affected by sluggish global demand and declining commodity prices.

According to the *Federal Reserve Bank of Richmond Service Sector Survey*, conditions were generally upbeat for services firms throughout the year. The revenues index for nonretail service firms was positive in every month except February. For 2016, the average index reading was six, a survey measure that indicated a slow and steady expansion for services firms.

Anecdotally, tourism and hospitality services generally experienced robust growth as contacts reported rising demand at hotels and restaurants.

Retail firms experienced a somewhat more varied business climate in 2016. According to the Richmond Fed survey, the revenues index for retail services remained above zero for the majority of the year but experienced a few months of negative values, including a sharp decline in August. Throughout the year, brick-and-mortar retailers commented on the challenges of competing with online retailers and reported unreliable foot traffic.

The surveys' measures of employment and wages were generally consistent with labor market data from other sources. Throughout the year, most manufacturers reported more employees, with a notable exception in September, when the index fell steeply into negative territory. The index for manufacturing wages has been positive since early 2010, but the average index value has trended higher in recent years. In 2016, the average index value was sixteen compared with thirteen in 2015—both up from nine in 2010.

Similarly, in the service sector, the index for number of employees remained above zero for all of 2016, and the average index value rose slightly compared to the prior year. As was the case with the revenues index, the nonretail services subsector followed the overall trend while the retail subsector was more volatile, with four months of negative employment index values. Average wages, on the other hand, mirrored the manufacturing industry, with persistently positive index readings in 2016 that were just slightly higher than in 2015 and considerably higher than 2010 through 2014. Furthermore, this trend was consistent among both retail and nonretail services.

Real Estate

Fifth District housing markets continued to improve in 2016, but they lagged national averages in some metrics. According to CoreLogic Information Solutions, District house prices grew 4.1 percent on a year-over-year basis, a rate that lagged the national average of 6.3 percent. The sharpest increase in the District was in South Carolina, where home prices rose 5.9 percent, while West Virginia reported the lowest house-price growth of 2.6 percent. Real estate agents throughout the District also reported rising prices and home sales throughout the year, but results varied by region and price level. In some cases, low inventory levels simultaneously reined in sales growth and spurred on new construction.

On balance, residential construction continued to accelerate in 2016 but was somewhat constrained by the availability of lots and a tight market for construction workers. Again, reports varied by location, with some reports of lot shortages driving up lot prices and, in at least one case, contributing to an increase in multifamily leasing and rents. Jurisdictions across the Fifth District issued a combined 138,900 residential building permits in 2016, which was a 1.3 percent increase over the previous year. About 27 percent of those permits were for multifamily units, down slightly from the 31 percent share of total units in 2015. Growth in single-family housing starts was more robust at 4.0 percent.

Commercial real estate (CRE) activity generally expanded throughout 2016. Grocery-anchored retail centers, hotels, health care facilities, and schools were, anecdotally, some of the faster-growing segments. Demand for construction in the retail segment also picked up; however, the square footage of a typical project was smaller than in the past. Office and

industrial leasing also rose on the whole, but there were some reports of supply constraints, particularly among the highest quality, Class-A properties.

Banking Conditions

Amid industry consolidation and earnings pressures from the continued low interest rate environment in 2016, Fifth District banks experienced steady loan growth, particularly in the CRE sector, and overall improvement in credit-quality indicators.

Although 94 percent of Fifth District banks were profitable in 2016, earnings remained under pressure, contributing to the industry's consolidation, mostly among smaller banks. The District's overall bank population declined by 8 percent, double the national consolidation rate. This trend helped some District banks improve earnings by achieving economies of scale. The District's median return on average assets (ROAA) of 0.73 percent improved slightly from a year ago with about half of District banks reporting an increasing ROAA. However, the District's median ROAA continued to lag the nation's by 0.20 percentage points due, in part, to higher than average overhead and personnel expense. Earnings improvements were mostly attributable to higher noninterest income and declining overhead costs related to greater efficiency gains at mid- and large-sized banks. While interest rates have risen, rate increases have yet to augment Fifth District margins, which remained compressed due to competition and the low-rate environment.

Balance sheets expanded, with median loan growth of 7.3 percent outpacing the national median of 5.8 percent. The fastest-growing segments were in CRE categories, namely non-owner-occupied CRE, and construction, land, and development. CRE loan growth led to higher CRE loan concentrations, a continuing trend in the District, and weighed on capital ratios.

Credit quality indicators improved, on average, with the Fifth District's level of nonperforming loans declining, but nonperforming loans remained above prerecession levels and 0.25 percentage points higher than the national average. While overall loan delinquencies improved, some District banks' provision expenses ticked up from the previous year.

Conclusion

Overall, 2016 was a year of continued economic expansion in the Fifth District. Employment expanded and wage growth accelerated slightly. However, the tightening labor market may have made it more difficult for businesses to find appropriately skilled employees. In some industries, such as construction, these difficulties could have constrained growth. Residential and commercial construction activity did pick up, though, as house prices rose and new home inventories continued to dwindle. Meanwhile, both manufacturers and services firms across the District reported positive developments in 2016 and were optimistic about the near future.

Boards, Councils, Officers, and Senior Professionals

FEDERAL RESERVE BANK OF RICHMOND BOARD OF DIRECTORS

The Bank's Board of Directors oversees management of the Bank and its Fifth District offices, provides timely business and economic information, participates in the formulation of national monetary and credit policies, and serves as a link between the Federal Reserve System and the private sector. Six directors are elected by banks in the Fifth District that are members of the Federal Reserve System, and three are appointed by the Board of Governors. Directors who are not bankers appoint the Bank's president and first vice president with approval from the Board of Governors.

The Bank's Board of Directors annually appoints the Fifth District's representative to the Federal Advisory Council, which consists of one member from each of the twelve Federal Reserve Districts. The council meets four times a year with the Board of Governors to consult on business conditions and issues related to the banking industry.

BALTIMORE AND CHARLOTTE BRANCHES BOARDS OF DIRECTORS

The Bank's Baltimore and Charlotte branches have separate boards that oversee operations at their respective locations and, like the Richmond Board, contribute to policymaking and provide timely business and economic information about the District. Four directors on each of these boards are appointed by the Richmond directors, and three are appointed by the Board of Governors.

COMMUNITY DEPOSITORY INSTITUTIONS ADVISORY COUNCIL

Created in 2011, the Bank's Community Depository Institutions Advisory Council advises the Bank's management and the Board of Governors on the economy, lending conditions, and other issues from the perspective of banks, thrifts, and credit unions with total assets under \$10 billion. The council's members are appointed by the Bank's president.

COMMUNITY INVESTMENT COUNCIL

Established in 2011, the Community Investment Council advises the Bank's management about emerging issues and trends in communities across the Fifth District, including low- and moderate-income neighborhoods in urban and rural areas. The council's members are appointed by the Bank's president.

PAYMENTS ADVISORY COUNCIL

Created in 1978, the Payments Advisory Council serves as a forum for communication with financial institutions about financial services provided by the Federal Reserve. The council helps the Bank respond to the evolving needs of its banking constituency. Council members are appointed by the Bank's first vice president.

THANK YOU

Thank you to those directors who completed their service in 2016: Russell C. Lindner, Charles R. Patton, and C. Richard Miller Jr. of the Richmond Board; Samuel L. Ross of the Baltimore Board; and Deborah Aguiar-Vélez, Elizabeth A. Fleming, and Paul E. Szurek of the Charlotte Board. Also, Kelly S. King completed his service as the Fifth District's representative to the Federal Advisory Council.

In 2017, the Bank welcomed seven new directors: Calvin G. Butler Jr., Ángel Cabrera, and William A. Loving Jr. joined the Richmond Board; Wayne A.I. Frederick joined the Baltimore Board; and Michael D. Garcia, Michelle A. Mapp, and R. Glenn Sherrill Jr. joined the Charlotte Board.

Listings of boards and councils on the following pages include members and titles as of December 31, 2016, unless otherwise noted.

Board of Directors—Federal Reserve Bank of Richmond



From the left: Kathy J. Warden, C. Richard Miller Jr., Catherine A. Meloy, Charles R. Patton, Margaret G. Lewis, Russell C. Lindner, Susan K. Still, Thomas C. Nelson, Robert R. Hill Jr.

CHAIR

Russell C. Lindner

*Executive Chairman and
Chief Executive Officer
The Forge Company
Washington, D.C.*

DEPUTY CHAIR

Margaret G. Lewis

*Retired President
HCA Capital Division
Richmond, Virginia*

Robert R. Hill Jr.

*Chief Executive Officer
South State Corporation and
South State Bank
Columbia, South Carolina*

Catherine A. Meloy

*President and
Chief Executive Officer
Goodwill of Greater Washington
and Goodwill Excel Center
Washington, D.C.*

C. Richard Miller Jr.

*President and
Chief Executive Officer
Woodsboro Bank
Woodsboro, Maryland*

Thomas C. Nelson

*Chairman, President, and
Chief Executive Officer
National Gypsum Company
Charlotte, North Carolina*

Charles R. Patton

*President and
Chief Operating Officer
Appalachian Power Company
Charleston, West Virginia*

Susan K. Still

*President and
Chief Executive Officer
HomeTown Bankshares
Corporation and
HomeTown Bank
Roanoke, Virginia*

Kathy J. Warden

*Corporate Vice President
and President,
Mission Systems
Northrop Grumman
Corporation
Linthicum, Maryland*

FEDERAL ADVISORY COUNCIL REPRESENTATIVE

Kelly S. King

*Chairman and
Chief Executive Officer
BB&T Corporation
Winston-Salem, North Carolina*



Board of Directors—Baltimore Branch



From the left: Mary Ann Scully, Kenneth R. Banks, Laura L. Gamble, Christopher J. Estes, Susan J. Ganz, Austin J. Slater Jr., Samuel L. Ross

CHAIR

Samuel L. Ross

*Chief Executive Officer
Bon Secours Baltimore
Health System
Baltimore, Maryland*

Kenneth R. Banks

*President and
Chief Executive Officer
Banks Contracting Company
Greenbelt, Maryland*

Christopher J. Estes

*President and
Chief Executive Officer
National Housing Conference
Washington, D.C.*

Laura L. Gamble

*Regional President
Greater Maryland
PNC
Baltimore, Maryland*

Susan J. Ganz

*Chief Executive Officer
Lion Brothers Company, Inc.
Owings Mills, Maryland*

Mary Ann Scully

*Chairman, President, and
Chief Executive Officer
Howard Bancorp
Ellicott City, Maryland*

Austin J. Slater Jr.

*President and
Chief Executive Officer
Southern Maryland Electric
Cooperative, Inc.
Hughesville, Maryland*

Board of Directors—Charlotte Branch



From the left: Claude Z. Demby, Elizabeth A. Fleming, Michael C. Crapps, Laura Y. Clark, Paul E. Szurek, Jerry L. Ocheltree

CHAIR

Laura Y. Clark

*Chief Impact Officer
United Way of Central Carolinas
Charlotte, North Carolina*

Michael C. Crapps

*President and
Chief Executive Officer
First Community Bank
Lexington, South Carolina*

Claude Z. Demby

*Vice President and
General Manager
Cree, Inc.
Durham, North Carolina*

Elizabeth A. Fleming

*Former President
Converse College
Spartanburg, South Carolina*

Jerry L. Ocheltree

*President and
Chief Executive Officer
Carolina Trust Bank
Lincolnton, North Carolina*

Paul E. Szurek

*Former Chief Financial Officer
Biltmore Farms, LLC
Asheville, North Carolina
Resigned on September 1, 2016*

In Memoriam:

*Deborah Aguiar-Vélez
Sistemas Corporation
Charlotte, North Carolina*



Community Depository Institutions Advisory Council

CHAIR

Robert A. DeAlmeida*
*President and
Chief Executive Officer
Hamilton Bank and Hamilton
Bancorp, Inc.
Towson, Maryland*

Suzanne S. DeFerie
*President and
Chief Executive Officer
Asheville Savings Bank and
ASB Bancorp, Inc.
Asheville, North Carolina*

Michael P. Fitzgerald
*Vice Chairman
United Bank, Inc.
Washington, D.C.*

William A. Loving Jr.
*President and
Chief Executive Officer
Pendleton Community
Bank, Inc.
Franklin, West Virginia*

Gary R. Mills
*President and
Chief Executive Officer
First Community Bank
Bluefield, Virginia*

David L. Morrow
*President and
Chief Executive Officer
CresCom Bank
Charleston, South Carolina*

Ronald D. Paul
*Chairman and
Chief Executive Officer
EagleBank and
Eagle Bancorp, Inc.
Bethesda, Maryland*

Jan Roche
*President and
Chief Executive Officer
State Department Federal
Credit Union
Alexandria, Virginia*

R. Arthur Seaver
*Chief Executive Officer
Southern First Bank
Greenville, South Carolina*

Judy Tharp
*President and
Chief Executive Officer
Piedmont Advantage
Credit Union
Winston-Salem, North Carolina*

Michael O. Walker
*President and
Chief Executive Officer
Benchmark Community Bank
and Benchmark Bankshares, Inc.
Kenbridge, Virginia*

**In 2016, Robert A. DeAlmeida
served as the Fifth District's represen-
tative on the Community Depository
Institutions Advisory Council at the
Board of Governors of the Federal
Reserve System.*

Community Investment Council

CHAIR

Mary M. Hunt
*Senior Program Officer
The Claude Worthington
Benedum Foundation
Pittsburgh, Pennsylvania*

MaryAnn Black
*Associate Vice President,
Office of Community and
Local Government Relations
Duke University Health System
Durham, North Carolina*

Tamea L. Franco
*President and
Chief Executive Officer
Global Metal Finishing, Inc.
Roanoke, Virginia*

Earl F. Gohl
*Federal Co-Chair
Appalachian Regional
Commission
Washington, D.C.*

Deborah L. Hooper
*Chief Operating Officer
Greensboro Partnership
Greensboro, North Carolina*

Jody Keenan
*State Director
Virginia Small Business
Development Center
Fairfax, Virginia*

John Maneval
*Deputy Director, Multifamily
Housing and Business Lending
Maryland Department of
Housing and Community
Development
Lanham, Maryland*

Charles Martin
*Administrative Vice President,
Regional Community
Reinvestment Officer
M&T Bank
Baltimore, Maryland*

Deborah McKetty
*Executive Director
CommunityWorks Carolina
Greenville, South Carolina*

Paul Phillips
*President and
Chief Executive Officer
Freedom First Federal
Credit Union
Roanoke, Virginia*

Kent R. Spellman
*Executive Director
The West Virginia Community
Development Hub
Stonewood, West Virginia*

Payments Advisory Council

CHAIR

E. Stephen Lilly

*Executive Vice President and
Chief Operating Officer*
First Community
Bancshares, Inc.
Bluefield, Virginia

William E. Albert

Senior Vice President
First Century Bank
Bluefield, West Virginia

Tim Boike

Senior Vice President
Wells Fargo and Company
Minneapolis, Minnesota

Ronald L. Bowling

*President and
Chief Executive Officer*
First Peoples Bank
Mullens, West Virginia

Karen Buck

*Head, Commercial, Retail and
Payment Operations*
TD Bank
Mount Laurel, New Jersey

Kim L. Bunn

*Senior Vice President and
Operations Executive*
Bank of America
Jacksonville, Florida

Richard Chin

*Senior Vice President
and Treasurer*
Pentagon Federal Credit Union
Alexandria, Virginia

John Kevin Cranford

Senior Vice President
BB&T Corporation
Charlotte, North Carolina

Robert E. Dael

*President and
Chief Executive Officer*
MACHA—The Mid-Atlantic
Payments Association
Hanover, Maryland

Peter Davey

*Vice President and Director,
Enterprise Payments*
Capital One Bank
Richmond, Virginia

Jeff W. Dick

*Chairman and
Chief Executive Officer*
MainStreet Bank
Fairfax, Virginia

Kristi A. Eller

*Chief Information Officer
and Executive Vice President,
Operations*
Yadkin Bank
Statesville, North Carolina

Margo D. Foust

*Senior Vice President, Operations
and Process Improvement*
American National Bank and
Trust Company
Danville, Virginia

Terry Garner

*Senior Vice President,
Deposit Operations*
Southern First Bank
Greenville, South Carolina

Jamin M. Hujik

Executive Vice President
CresCom Bank
Charleston, South Carolina

Adrian S. Johnson

*Senior Vice President and
Chief Financial Officer*
MECU of Baltimore, Inc.
Baltimore, Maryland

Alison Lyewski

*Senior Vice President, EIS
Transaction Operations*
SunTrust Bank
Orlando, Florida

Carla A. Nealy

*Executive Vice President and
Chief Operating Officer*
The Harbor Bank of Maryland
Baltimore, Maryland

Tracy J. Nelms

Executive Vice President
TowneBank
Suffolk, Virginia

Holly Pingatore

*Senior Vice President and
Director of Deposit Operations*
South State Bank
Charleston, South Carolina

Rick Rhoads

Senior Vice President, E-Services
State Employees' Credit Union
Raleigh, North Carolina

Susan G. Riel

*Senior Executive Vice President
and Chief Operating Officer*
EagleBank
Bethesda, Maryland

D.J. Seeterlin

Chief Information Officer
Chesapeake Bank
Kilmarnock, Virginia

Steve Shuford

*Senior Vice President and
Director, Treasury Management*
Paragon Bank
Raleigh, North Carolina

Woody Shuler

Vice President, Finance
SRP Federal Credit Union
North Augusta, South Carolina

Steve Stone

Executive Vice President
United Bank
Charleston, West Virginia

Chris Tolomeo

*Senior Vice President,
Banking Services*
M&T Bank
Amherst, New York

Paul Trozzo

Senior Vice President
PNC Bank
Pittsburgh, Pennsylvania

David Willis

*Senior Vice President,
Debit Card and Funds Services*
Navy Federal Credit Union
Vienna, Virginia

Gayle Youngblood

*Assistant Vice President,
Product Management*
State Employees
Credit Union of Maryland
Linthicum, Maryland

Management Committee



From the left: Roland Costa, David E. Beck, Michelle H. Gluck, Becky C. Bareford, Mark L. Mullinix, Kartik B. Athreya, Jeffrey M. Lacker, Jennifer J. Burns, Janice E. Clatterbuck, Matthew A. Martin, Michael D. Stough

Jeffrey M. Lacker
President

Mark L. Mullinix
*First Vice President and
Chief Operating Officer*

Kartik B. Athreya
*Executive Vice President and
Director of Research*

Becky C. Bareford
*Senior Vice President,
Human Resources and Finance*

David E. Beck
*Senior Vice President and
Baltimore Regional Executive*

Jennifer J. Burns
*Executive Vice President,
Supervision, Regulation,
and Credit*

Janice E. Clatterbuck
*Senior Vice President and
Chief Information Officer*

Roland Costa
*Senior Vice President and
Chief Technology Officer*

Michelle H. Gluck
*Executive Vice President,
General Counsel, and
Chief Risk Officer*

Matthew A. Martin
*Senior Vice President and
Charlotte Regional Executive*

Michael D. Stough
*Senior Vice President and
General Auditor*

Listings include officers, senior professionals, and titles as of December 31, 2016.

Officers

John A. Weinberg
Senior Vice President and
Special Advisor to the President

Huberto M. Ennis
Group Vice President

Thomas A. Lubik
Group Vice President

Lisa T. Oliva
Group Vice President

Michael L. Wilder
Group Vice President and
Chief Financial Officer

Hattie R.C. Barley
Vice President

Christy R. Cleare
Vice President

Todd E. Dixon
Vice President

Kevin W. Fergusson
Vice President and
Medical Director

Joan T. Garton
Vice President

Richard B. Gilbert
Vice President

Rebecca Goldberg
Vice President

Anne C. Gossweiler
Vice President

Bruce E. Grinnell
Vice President

Mattison W. Harris
Vice President

Kathleen R. Houghtaling
Vice President and
Chief Diversity Officer

Cathy I. Howdyshe
Vice President

Gregory A. Johnson
Vice President and Assistant
General Auditor

Malissa M. Ladd
Vice President

Ann B. Macheras
Vice President

Andrew S. McAllister
Vice President

Diane H. McDorman
Vice President

James T. Nowlin
Vice President

Brielle M. Stanley
Vice President

Alexander L. Wolman
Vice President

H. Julie Yoo
Vice President

Niranjana Chandramowli
Assistant Vice President

Cary B. Crabtree
Assistant Vice President

Bary M. Dalton
Assistant Vice President

Jeffrey B. Deibel
Assistant Vice President

Jacqueline R. Draper
Assistant Vice President

Adam M. Drimer
Assistant Vice President

Gina E. Friesse
Assistant Vice President

Kimberley D. Fuller
Assistant Vice President

Keith R.G. Goodwin
Assistant General Counsel

Jennifer J. Hall
Assistant General Counsel

Ann S. Harrison
Assistant Vice President

James R. Hart
Assistant Vice President

Pinkaj R. Klokenga
Assistant Vice President

Diane R. Knapp
Assistant Vice President

D. Keith Larkin
Assistant Vice President

Chuck Lewis
Assistant Vice President

Steve V. Malone
Assistant Vice President

Randal C. Manspile
Assistant Vice President

Jonathan P. Martin
Assistant Vice President

Laura H. Mayer
Assistant Vice President

Bennie R. Moore
Assistant Vice President

Cheryl R. Moore
Assistant Vice President

Johnnie E. Moore
Assistant Vice President

Dennis H. Ott Jr.
Assistant Vice President

Christopher J. Palumbo
Assistant Vice President

Christin L. Patel
Assistant Vice President and
Corporate Secretary

Patricia A. Perry
Assistant Vice President

Melanie M. Rose
Assistant Vice President

Jason C. Schemmel
Assistant Vice President

Michael J. Seifert
Assistant Vice President

Markus A. Summers
Assistant Vice President

Alexander T. Swartz
Assistant Vice President

Sandra L. Tormoen
Assistant Vice President

James Trotta
Assistant Vice President

Lauren E. Ware
Assistant Vice President

BALTIMORE BRANCH

Chad K. Harper
Vice President

Steven T. Bareford
Assistant Vice President

Kerri A. Coard
Assistant Vice President

CHARLOTTE BRANCH

Lisa A. White
Senior Vice President

Terry J. Wright
Group Vice President and
Charlotte Deputy Regional
Executive

Jeremy B. Caldwell
Vice President

Kerri R. O'Rourke-Robinson
Vice President

Richard F. Westerkamp Jr.
Vice President

Ronald G. Barnes
Assistant Vice President

Joshua R. Daulton
Assistant Vice President

Jeffrey R. Gerlach
Assistant Vice President

Kelly J. Stewart
Assistant Vice President

In Memoriam:
P.A.L. "Trish" Nunley
Deputy General Counsel

Senior Professionals

RESEARCH

Borys M. Grochulski
Senior Economist

Robert L. Hetzel
Senior Economist and
Research Advisor

Andreas L. Hornstein
Senior Advisor

John Bailey Jones
Senior Economist and
Research Advisor

Christian Matthes
Senior Economist

Urvi Neelakantan
Senior Policy Economist

Raymond E. Owens III
Senior Economist and
Policy Advisor

Santiago M. Pinto
Senior Policy Economist

Pierre-Daniel G. Sarte
Senior Advisor

Nicholas Trachter
Senior Economist

John R. Walter
Senior Economist and
Policy Advisor

Zhu Wang
Senior Economist

Roy H. Webb
Senior Economist and
Policy Advisor

SUPERVISION, REGULATION,
AND CREDIT

Azamat Abdymomunov
Lead Financial Economist

Eliaana Balla
Lead Financial Economist

Craig S. Edwards
Large Bank Principal Examiner

Craig W. Frascati
Large Bank Principal Examiner

D. Keith Maglinger
Large Bank Principal Examiner

Hemangini R. Parekh
Large Bank Principal Examiner

Stanley F. Poszywak
Large Bank Principal Examiner

Todd M. Ryan
Large Bank Principal Examiner

Steven D. Sanderford
Large Bank Principal Examiner

Federal Reserve Information Technology (FRIT) Management Council



From the left: Matthew D. Larson, Kathryn K. Smith, Scott C. Furman, Robert I. Turner, Lyn McDermid, David N. Alfano, Devon A. Bryan, James A. Lammers

Lyn McDermid

System Chief Information Officer

Devon A. Bryan

*Executive Vice President and
Chief Information Security Officer*

James A. Lammers

*Executive Vice President and
Chief Technology and
Strategy Officer*

Robert I. Turner

*Executive Vice President and
Chief Operating Officer*

David N. Alfano

*Senior Vice President and
Chief Administrative Officer*

Scott C. Furman

*Senior Vice President,
Treasury Services*

Matthew D. Larson

*Senior Vice President,
End User Services*

Kathryn K. Smith

*Senior Vice President,
Project and Program Delivery*

Federal Reserve Information Technology (FRIT) Officers

Jeffrey F. Crow
Senior Vice President

Donovan O. Harper II
Senior Vice President

Andy Hendrickson
Senior Vice President

Gerald L. Moreno
Senior Vice President

Christopher A. Tignor
Senior Vice President

Kevin J. Craig
Group Vice President

Gary M. Patton
Group Vice President

Paul R. Sans
Group Vice President

Scott D. Auble
Vice President

Nicole E. Bennett
Vice President

Reginal L. Bryant
Vice President

Jane Y. Burk
Vice President

Gerry P. Collins
Vice President

Michael E. Cortese
Vice President

Albert M. D'Avanzo
Vice President

Fay T. Donahue
Vice President

Frank J. Doto
Vice President

Valerie A. Freund
Vice President

Mark A. Hamilton
Vice President

Kristofer K. Hogan
Vice President

Christine M. Holzem
Vice President

Tamera S. Hornsby-Fink
Vice President

Jon C. Jeswald
Vice President

Frederick B. Johnson
Vice President

Carie L. Kelleher
Vice President

Vicki L. Kosydor
Vice President

S. Craig Minyard
Vice President

Mahnaz Moosa
Vice President

A. Vinton Myers III
Vice President

Peter J. Purcell
Vice President

R. Nathan Ragan
Vice President

Victoria F. Riendeau
Vice President

Joyce M. Romito
Vice President

Apurva A. Shah
Vice President

Hunter R. Shomo
Vice President

Stephen B. Silverman
Vice President

Joshua N. Snell
Vice President

Sherri L. Thorne
Vice President

Jeannie L. Willette
Vice President

Abigail T. Baker
Assistant Vice President

Michael L. Bellanti
Assistant Vice President

Jeffrey S. Borneman
Assistant Vice President

Cynthia S. Bullington
Assistant Vice President

Melissa E. Butler
Assistant Vice President

James A. Caulfield
Assistant Vice President

William C. Conway II
Assistant Vice President

John F. Crabtree
Assistant Vice President

Michael S. Everett
Assistant Vice President

William H. Fenerty
Assistant Vice President

Lisa Marie Gravely
Assistant Vice President

Gary A. Helfrich
Assistant Vice President

M. Polly Helm
Assistant Vice President

Peter B. Holleran
Assistant Vice President

M. Brannon Howle
Assistant Vice President

Bradley M. Joiner
Assistant Vice President

John T. Lines
Assistant Vice President

Garland H. McKenzie
Assistant Vice President

Ellen D. Mitchell
Assistant Vice President

Arthur J. Papa Jr.
Assistant Vice President

Heidi R. Patterson
Assistant Vice President

Irina V. Piven
Assistant Vice President

Kevin A. Reed
Assistant Vice President

Stephanie T. Shetterly
Assistant Vice President

Christopher T. Szymonik
Assistant Vice President

Thomas J. Weber
Assistant Vice President

Senior Professionals

Elise P. Ott
Chief Application
Integration Engineer

Michael T. Shaughnessy
Chief Application
Integration Engineer

L. Sergio Altomare
Business Architect (Treasury)

Ian W. Beirnes
Business Architect (Treasury)

Pedro E. Fong
Business Architect

Devin D. Gordon
Business Architect

M. Scott Hannah
Business Architect

Robert B. Klank
Business Architect

Darren L. Knutson
Business Architect

Donald H. Larmee
Business Architect

Susan L. Perlmutter
Information Architect

Eric B. Stanley
Information Architect

Listings include officers, senior professionals, and titles as of December 31, 2016.

Financial Statements

The audited annual financial statements of the Federal Reserve Bank of Richmond as of and for the years ended December 31, 2016, and December 31, 2015, are incorporated here by reference. They are available at the Board of Governors of the Federal Reserve System at www.federalreserve.gov/aboutthefed/files/richmondfstmt2016.pdf. That public disclosure also provides: Notes to Financial Statements, Management's Report on Internal Control over Financial Reporting, and the Independent Auditors' Report.

The Board of Governors' Statement of Auditor Independence is provided below.

Statement of Auditor Independence

The Federal Reserve Board engaged KPMG to audit the 2016 combined and individual financial statements of the Reserve Banks.¹

In 2016, KPMG also conducted audits of internal controls over financial reporting for each of the Reserve Banks. Fees for KPMG services totaled \$6.7 million. To ensure auditor independence, the Board requires that KPMG be independent in all matters relating to the audits. Specifically, KPMG may not perform services for the Reserve Banks or others that would place it in a position of auditing its own work, making management decisions on behalf of the Reserve Banks, or in any other way impairing its audit independence. In 2016, the Bank did not engage KPMG for any non-audit services.

¹ In addition, KPMG audited the Office of Employee Benefits of the Federal Reserve System (OEB), the Retirement Plan for Employees of the Federal Reserve System (System Plan), and the Thrift Plan for Employees of the Federal Reserve System (Thrift Plan). The System Plan and the Thrift Plan provide retirement benefits to employees of the Board, the Federal Reserve Banks, the OEB, and the Consumer Financial Protection Bureau.

**The Federal Reserve Bank of Richmond
2016 Annual Report was produced by the
Research Department, Publications Division.**

MANAGING EDITOR: Karl Rhodes

DESIGN: Janin/Cliff Design

GROUP PHOTOGRAPHY: Larry Cain

PRINTING: Federal Reserve Bank of Richmond

Special thanks to Gina Karp, Lisa Kenney, Susan Maxey, and Joseph Mengedoth.

**The 2016 Annual Report also is available on the
Bank's website: www.richmondfed.org.**



FIFTH FEDERAL RESERVE DISTRICT OFFICES

RICHMOND

701 East Byrd Street
Richmond, Virginia 23219
(804) 697-8000

BALTIMORE

502 South Sharp Street
Baltimore, Maryland 21201
(410) 576-3300

CHARLOTTE

530 East Trade Street
Charlotte, North Carolina 28202
(704) 358-2100



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OF RICHMOND®**

Richmond • Baltimore • Charlotte
www.richmondfed.org

