

REPORT ON THE COMPETITIVENESS
of PUERTO RICO'S ECONOMY



FEDERAL RESERVE BANK *of* NEW YORK



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June 29, 2012



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FOREWORD

Our Commitment to Puerto Rico

At the Federal Reserve Bank of New York (popularly known as the New York Fed), we are proud that Puerto Rico is part of the Second District, which we represent in the Federal Reserve System. We are deeply committed to the people of the Island and to its growth and prosperity. Our commitment is reflected in the ongoing work of our Outreach and Education teams with partners on the Island and in the research by our economists, who monitor and analyze local economic conditions. This analysis—along with similar analysis from other regions across our nation—feeds into the decisions the Federal Reserve makes on monetary policy and regulation of the financial system.

In support of this work, I and other senior New York Fed officials visit Puerto Rico regularly and meet with a wide range of local stakeholders, including business people, community representatives, workers, and regional leaders. In these visits, I have witnessed some of the bright spots for the economy. I have seen examples of expansion and growth. This gives me confidence that Puerto Rico has the capability to be a true economic success story, provided that the talents of its people are supported by sound public policy and good private sector decision making.

Nevertheless, these local engagements and analysis of economic conditions also confirm that growth and expansion are not happening broadly enough. Conditions for many families, communities, and businesses remain difficult. The task of putting the Island on a path of robust, sustainable, and inclusive growth remains a work in progress. The New York Fed will do all that it can, in keeping with its responsibility to promote community development in its District, to support these efforts, and this report is part of our commitment to do so.

Report on Competitiveness

On a visit to the Island in March 2011, I was asked by a group of business and community leaders to look at what might be holding back economic growth on the Island. While recognizing the sophisticated analysis that many local thinkers and institutions have already provided on this subject, they believed it would be helpful for the New York Fed, as an independent third party, to evaluate what might be done to promote competitiveness and productivity. I agreed that we would do so. Upon my return to New York, I commissioned a team of economists from our Research group and other experts from our Outreach and International teams to analyze the challenges facing Puerto Rico and to put forward some recommendations on how to capitalize on the Island's strengths to restore growth.

In doing so, they consulted widely with local, national, and international experts, as well as stakeholders on the Island itself. As we know all too well, real insight requires on-the-ground experience. This report is the product of their work. I have read it closely and commend it to your attention. The report represents nonpartisan technical analysis and should be viewed in that vein. Even those who do not agree with every piece of the analysis, I hope, will acknowledge that this is a serious effort to frame a number of issues that are worthy of consideration. Of course, many of these issues would need to be considered as part of the political process, and it is for the people of Puerto Rico to judge the trade-offs involved.

Ongoing Engagement

I do not view this report from my staff as the last word on these important questions. We do not presume to claim that we have the answers. Rather, I hope that it will prompt a constructive and bipartisan debate that will advance good public policy and a better future for the people of Puerto Rico.

I also hope that it will be read and considered beyond the business and government community, across the society at large. The goal we all seek is not simply business success and expansion, but broad-based prosperity, with rising standards of living and enhanced opportunities for all Puerto Ricans to pursue their ambitions and realize their dreams—here on this beautiful island.

In the months and years ahead, the New York Fed will continue to engage with stakeholders across the Island to discuss the topics raised in the report and others. We will continue to hear first-hand the economic and financial issues that are important for businesses and families and will continue to do all that we can to support local communities and decision makers in advancing good economic outcomes.

William C. Dudley
President of the Federal Reserve Bank of New York
June 29, 2012

EXECUTIVE SUMMARY

The term *competitiveness* refers to productive efficiency, or getting the most output from available resources. Puerto Rico has a number of features that make it a strong and potentially highly competitive economy: Literacy rates and educational attainment continue to improve, the labor force is largely bilingual, the economy is open with a favorable location, and close ties to the U.S. mainland economy provide many advantages. However, Puerto Rico's economic progress has stalled: the Island has been operating below its potential for some time and the competitiveness of the economy continues to deteriorate. The underutilization of labor resources, evidenced by persistently high unemployment and strikingly low labor force participation rates, provides the clearest evidence of a lack of competitiveness.

The challenge to policymakers is to marshal the Island's considerable strengths to raise living standards and restore growth. In this report, we identify five factors that in our view pose significant competitive challenges to the Island:

- ***Improving Labor Market Opportunities:*** Puerto Rico's labor force participation rate is among the lowest in the world, with less than half of eligible workers participating in the formal economy. Moreover, the unemployment rate has been persistently well above the U.S. mainland's, and is especially high for the young and less educated.
- ***Developing Human Capital:*** Although the Island's workforce overall is among the world's most educated, Puerto Rico still lags the U.S. mainland, and there is a particularly high abundance of low-skilled workers. There are also growing concerns that the quality of the education system has deteriorated, especially at the primary and secondary levels.
- ***Reducing the Costs of Doing Business:*** The business environment in Puerto Rico makes it costly and cumbersome to establish and grow new businesses and expand existing ones. In particular, regulations, the elevated cost of electricity, and an underdeveloped and costly transportation infrastructure are barriers to a more dynamic environment.
- ***Mobilizing Finance for Business Development and Growth:*** Weak banks and limited alternatives to bank funding have reduced credit availability to local businesses.
- ***Lowering Dependence on a Shrinking Industry:*** Tax incentives led to an outsized presence of the pharmaceuticals industry on the Island. The incentives have been phased out and employment in the industry has declined. Going forward, there appears to be only a limited prospect for the sector to be a driver of growth.

Puerto Rico has made noteworthy efforts in recent years to address different aspects of these complex and interrelated challenges. But more can be done. We present five policy recommendations. Several reflect themes that have been actively discussed and debated—and in a few cases, already addressed—on the Island. The recommendations should not be viewed as providing a quick fix, but rather as important steps to help improve Puerto Rico's competitiveness over time. We present these recommendations for consideration and discussion, and invite feedback from stakeholders on the Island regarding their implementation and expected impacts, as well as any additional actions that may strengthen their effectiveness.

Recommendation 1: Reduce Barriers to Job Creation and Labor Force Participation

Creating jobs and encouraging active participation in the labor market should be a top priority for policymakers. Opportunities for the young and less educated in Puerto Rico are particularly limited, and these workers are in danger of becoming disconnected from the labor market. We recommend focusing on policies that spur the creation of job opportunities and improve incentives to work. One possible first step would be to consider a young-worker subminimum wage that targets workers under the age of 25. The minimum could be stepped up at regular intervals as the worker continues employment and builds skills with a given firm, so that the worker's wage would match the federal minimum over a number of years. A wider reexamination of the application of the federal minimum wage and the design of entitlement programs may also be warranted in order to improve incentives to seek employment and increase the number of jobs available for workers on the Island.

Recommendation 2: Reform the Energy Industry

An efficient and competitive energy sector is essential for the wider success of the Puerto Rican economy. Best practice suggests that a regulatory commission should be established to oversee the Puerto Rico Electric Power Authority to protect consumers and improve the efficiency of the utility's operations. It is standard on the U.S. mainland as well as in other countries for a monopoly utility to be subject to regulatory oversight, even when the utility is government owned. The rules to allow the renewable-energy industry access to the power grid should be clarified; one solution would be to adopt the wholesale market rules used on the U.S. mainland.

Recommendation 3: Lower the Costs of Doing Business

Independent studies suggest that Puerto Rico continues to lag the mainland and regional peers in ease of doing business, though these studies find some progress in recent years. Continued systematic effort to further streamline regulatory processes and reduce red tape appears to be warranted. Separately, the high cost of shipping is a substantial burden on the Island's productivity. Puerto Rico is in a distinctive situation with respect to the Jones Act because of its status as an island economy. One option could be to seek a temporary exemption from the Jones Act, for instance for five years, in order both to evaluate whether or not these restrictions really are a substantial cause of elevated shipping costs and to allow for assessment of the costs and benefits of a permanent exemption.

Recommendation 4: Foster Partnerships between Industry and Higher Education

Colleges and universities are important assets that can help Puerto Rico actively participate in the knowledge economy. One way the Island can build on these assets is to foster partnerships between private industry and higher-education institutions. These partnerships tend to offer localized economic benefits by increasing economic activity associated with the creation, development, and commercialization of new products or processes. One way forward would be for the government of Puerto Rico or a non-profit institution on the Island to help establish a center of excellence focusing on the development of globally important technologies by providing seed funding and incentivizing industry investment. Moreover, commercialization of academic research should be more actively supported. An initial step in this process might be the formation of a task force made up of members of academia, industry, non-profit institutions, and government to identify the most promising opportunities in Puerto Rico.

Recommendation 5: Promote Independent Policy Evaluation

The economy's growth potential is strongly influenced by the quality of government policies. Accordingly, greater efforts should be made to evaluate specific policies routinely to determine if the benefits exceed the costs; in this way, the best ideas will have a chance to be adopted while those found lacking can be eliminated. The effectiveness of government policies also depends on data on the economy's structure and operation. More resources should be devoted to improving and expanding economic indicators for the Island in order to bring them into line with the indicators regularly used to track regional conditions on the U.S. mainland.

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I. INTRODUCTION AND GOALS

The term *competitiveness* refers to productive efficiency, or getting the most output from available resources. For Puerto Rico, being competitive means that its workforce and capital stock are fully utilized and allocated to their most productive uses. In a more dynamic sense, being competitive implies that conditions and policies are in place to support business development and innovation. Increasingly, competitiveness also encompasses the capacity to adapt quickly and efficiently to the many changes taking place in the global economy. This latter dimension is particularly important for Puerto Rico, because as a small island economy, it faces stiff competition from a variety of alternative locations.

On several measures, Puerto Rico has features that make it a strong—and potentially a highly competitive—economy:

- The literacy rates and educational attainment of Puerto Rico’s adult population compare favorably with those of most economies in the region, and have nearly caught up with those on the U.S. mainland.
- The labor force is largely bilingual.
- The economy is open and is favorably located, occupying a central position in the Caribbean and providing a gateway between the the U.S. mainland and Latin America.
- The Island has extensive experience as a host to a variety of major U.S. multinational corporations.

The Island also benefits from close ties to the U.S. mainland economy: The residents are U.S. citizens with unrestricted access to the mainland, the dollar is the official currency, the legal system affords the protections of the U.S. constitution, and Federal grants support a number of programs available to U.S. mainland residents, particularly in the areas of health and education.

However, after making considerable economic progress during the early part of the twentieth century, Puerto Rico since the 1970s has seen that progress stall.¹ The Island has been operating below its potential and the competitiveness of the economy has been deteriorating. Of particular concern is the scant progress made in addressing the Island’s long-standing high unemployment and strikingly low rate of labor force participation. Compounding this long-term economic stagnation, the current cyclical downturn on the Island has been deeper and more protracted than that on the U.S. mainland, and activity has yet to show strong signs of recovery.

The challenge to policymakers in Puerto Rico is to marshal the Island’s considerable strengths to achieve the significant improvement in competitiveness needed to help restore economic growth and raise living standards on the Island. We begin this *Report* with an examination of the key challenges facing policymakers in Puerto Rico as they strive to improve the performance of the economy. Our analysis is informed by the available economic data for Puerto Rico and the findings of previous studies of the economy’s performance, and by our discussions with local business leaders and a number of experts on Puerto Rico’s economy. The specific challenges are:

- Improving labor market opportunities.
- Developing human capital.
- Reducing the costs of doing business.
- Mobilizing finance for growth and development.
- Lowering dependence on a shrinking industry.

¹Bosworth and Collins (2006).

Each of these challenges focuses on a feature of the Island's economic environment that is preventing Puerto Rico from reaching its potential.

These challenges are complex and interrelated, and there is no single, easy policy intervention that will make the economy more competitive. We offer a set of recommendations that, in our view, help address the fundamental issues of raising efficiency and improving the environment for longer-term growth. Several of our recommendations build upon and support ongoing efforts on the Island. Our five policy recommendations are as follows:

- Reduce barriers to job creation and labor force participation.
- Reform the energy industry.
- Lower the costs of doing business.
- Foster partnerships between industry and higher education.
- Promote independent policy evaluation.

The paper is organized as follows: Section II provides a brief overview of economic conditions in Puerto Rico. This review puts the Island's performance in perspective and highlights the need to address the Island's competitiveness. In Section III, we discuss several of the major challenges facing policymakers on the Island. In Section IV, we present five policy recommendations for consideration and discussion. These recommendations should not be viewed as providing a quick fix but rather as important steps in the direction of improving competitiveness. We invite feedback from stakeholders on the Island regarding the implementation and expected impacts of the recommendations, as well as any additional actions that may strengthen their effectiveness.

II. THE ECONOMIC PERFORMANCE OF PUERTO RICO

It is well established that Puerto Rico's economy has been stagnant since the 1970s.² In recent years, a severe downturn has compounded Puerto Rico's longstanding economic problems, with real gross national product (GNP) down about 10 percent from its 2005 level (**Figure 1**).³ Historically, the Island's economy has tended to track the U.S. mainland economy, and some of the factors underlying the recent decline in Puerto Rico mirror those on the U.S. mainland, including weakness in the real estate market, stress on financial institutions, declines in construction activity, and a significant paring back of government jobs. The latest downturn in Puerto Rico, however, started earlier and was much steeper than that on the U.S. mainland, and to date, the economy has shown no strong sign of recovery.

In analyzing the Puerto Rican economy, we keep in mind one of its unique features: a substantial share of production is carried out by U.S. multinational corporations that took advantage of the sizable federal income tax benefits available to firms that located on the Island.⁴ The repatriation of the profits of these corporations to their parent firms on the U.S. mainland, in addition to a shifting of income by these U.S. corporations, leads to an overstatement of the amount of income accruing to residents of Puerto Rico. The GNP measure of output captures the income actually accruing to Island residents, in contrast to the measure of output used in most countries, gross domestic product (GDP), which includes some income generated on the Island accruing to non-Island residents.⁵ The divergence between GDP and GNP on the Island is large: It reached roughly \$30 billion in 2010—nominal GDP on the Island was about \$95 billion, while nominal GNP was roughly \$65 billion (**Figure 2**).⁶

GNP per capita in Puerto Rico is roughly \$15,000, about one-third of the level on the U.S. mainland.⁷ Real GNP per capita on the Island grew by almost 3 percent annually from the early 1980s through 2005. Since 2005, however, this measure has fallen and real earnings of workers in Puerto Rico have returned to their level of a decade ago (**Figure 3**).

Puerto Rico's weak economic performance is clearly visible through its labor market. The unemployment rate is roughly double the rate seen on the U.S. mainland, a gap that has existed for decades (**Figure 4**). In the recent downturn, the unemployment rate on the Island reached more than 16 percent. This high unemployment rate, however, captures only part of the problem. The Island's persistently low labor force participation rate indicates a strikingly high degree of underutilized resources. In 2011, the rate was only 41 percent, more than 20 percentage points below the U.S. mainland's rate.⁸ Only a handful of countries have less than half of their working-age population participating in the labor force (**Figure 5**). The Island's labor force participation rate is particularly low for young and uneducated workers.

² Bosworth and Collins (2006).

³ Another measure of the state of the economy—an index of economic activity produced by the Government Development Bank of Puerto Rico since 2001—shows that the decline began in 2005 and that activity has only begun to turn modestly upward in the past few months.

⁴ The tax benefits were initially embodied in Section 936 of the IRS tax code, and these U.S. firms were often referred to as "936 firms." The incentives were completely phased out in 2005, but other tax benefits still provide an incentive for U.S. firms to locate operations in Puerto Rico. See Government Accountability Office (2006).

⁵ GNP is the measure most frequently used in government economic and fiscal reports in Puerto Rico.

⁶ The current gap between GDP and GNP in Puerto Rico of more than 30 percent is significantly higher than the gaps in similarly sized economies with a high presence of foreign multinational corporations, such as Ireland (20 percent), Panama (10 percent), and Singapore (10 percent). Bosworth and Collins (2006) compute a rough estimate of Puerto Rico's GDP that excludes this income shifting. Based on their measure, actual GDP in 2004 was about 20 percent lower than reported GDP. Bram, Martinez and Steindel (2008) discuss the differential effects of section 936 on GDP and GNP.

⁷ While per capita income on the Island is considerably below the U.S. mainland's, it is well above per capita income in a number of other countries in the region, including the Dominican Republic, Mexico, Venezuela, and Panama.

⁸ This participation rate is low even when controlling for demographic characteristics of the workforce—including age, gender, and educational attainment—and the large gap with the U.S. mainland has persisted for decades.

In many ways, Puerto Rico's high unemployment rate and low labor force participation rate are the clearest evidence of a lack of competitiveness and economic progress. The poor performance of the labor market is, in part, the result of a slowing in growth and, at the same time, a major contributor to the Island's economic problems. The failure to utilize a large part of the workforce has been a characteristic of the Island for some time. The lack of significant progress in improving the labor market suggests that fundamental structural impediments are at work throughout the economy that are keeping Puerto Rico from realizing its full potential.

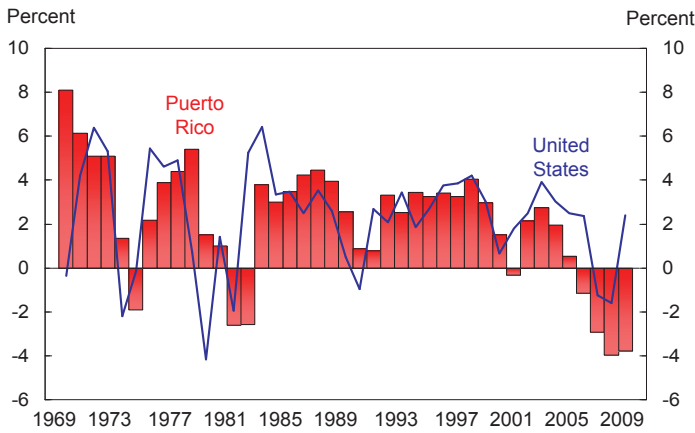
The Island's public finances have also been weak. Deficits in the commonwealth's (central government) fiscal accounts began to widen in the late 1990s, and between 1999 and 2004, central government expenses grew faster than tax revenues.⁹ These persistent deficits increased the Island's public debt and led to questions about the sustainability of its fiscal policy. While debt growth moderated somewhat in the mid-2000s, Puerto Rico's government bonds at the end of 2005 were rated just barely above noninvestment grade. Since then, a number of efforts have been made to restructure the Island's fiscal operation. An early response was the significant downsizing of government employment that began in 2007.¹⁰ In 2009, a fiscal stabilization plan was put into effect that reduced government spending and increased tax revenues.¹¹ The Island's finances have clearly improved, but deficits have not been entirely eliminated, public debt remains high, and public employee pension funding is low. The concerted efforts now being undertaken to restrain debt build-up can potentially put the Island's finances on a sounder footing, but significant progress in these areas will likely require that a solid economic recovery get under way.

⁹See Alm (2006) for a discussion of Puerto Rico's fiscal policies.

¹⁰Between 2007 and 2009, government employment declined by almost 10 percent, or about 40,000 workers.

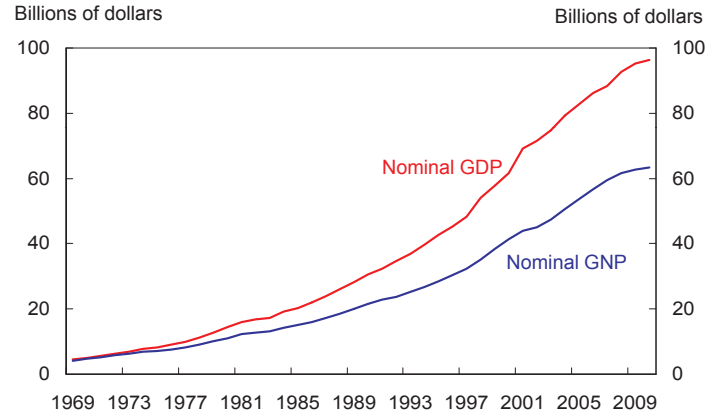
¹¹See the analysis of Puerto Rico's fiscal restructuring plans from the Government Development Bank for Puerto Rico (2011), available at: http://www.gdb-pur.com/investors_resources/publications-reports/commonwealthfiodr/commonwealthreport.pdf.

Figure 1. Real GNP Growth: Puerto Rico and the United States



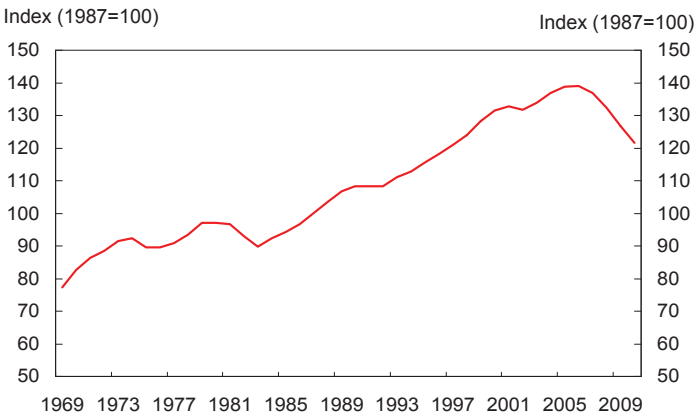
Sources: Puerto Rico Planning Board; U.S. Bureau of Economic Analysis.

Figure 2. GDP and GNP: Puerto Rico



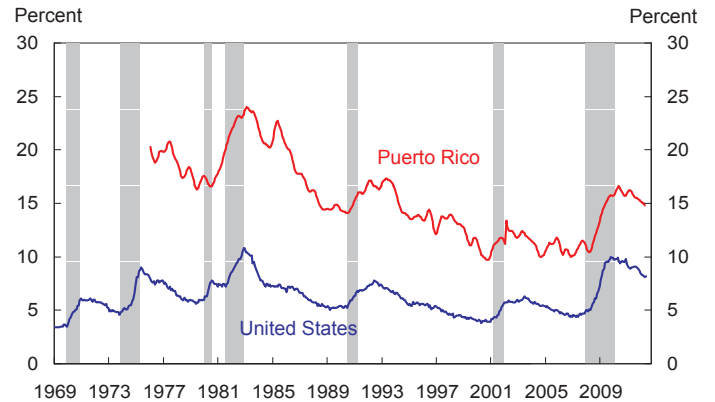
Sources: Puerto Rico Planning Board; U.S. Bureau of Economic Analysis.

Figure 3. Real GNP Per Capita: Puerto Rico



Source: Puerto Rico Planning Board.

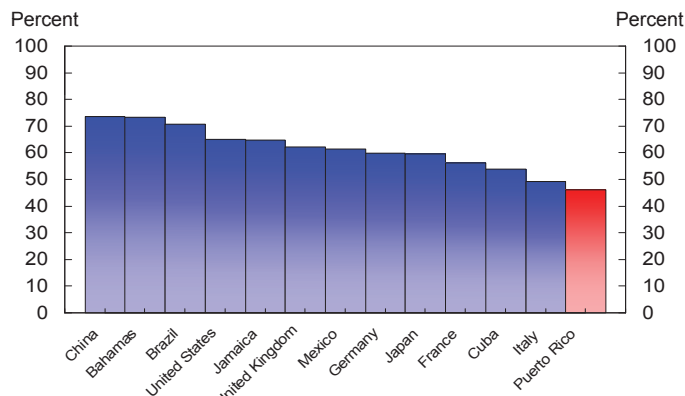
Figure 4. Unemployment Rate: Puerto Rico and the United States



Source: U.S. Bureau of Labor Statistics.

Notes: Data are seasonally adjusted. Shading indicates periods designated recessions by the National Bureau of Economic Research (mainland). Puerto Rico unemployment data unavailable prior to 1976.

Figure 5. Labor Force Participation Rates: Selected Countries



Source: International Labour Organization, 2009.

Note: The labor force participation rate is defined as the share of each country's population over the age of 15 that is either working or actively seeking work.

III. CHALLENGES TO PUERTO RICO'S COMPETITIVENESS

The lack of progress in Puerto Rico, together with its especially weak economic performance in recent years, underscores the imperative of identifying and addressing the obstacles to a fuller utilization of the Island's resources. The Island has considerable strengths and economic potential that policymakers can harness in order to improve economic performance. For the purpose of this report, we focus on five key challenges facing the Island's policymakers: improving labor market opportunities, developing human capital, reducing the costs of doing business, mobilizing finance for business development and growth, and lowering dependence on a shrinking industry. While these challenges are interrelated, we focus on each as a separate impediment and outline its causes and consequences.

1. Improving Labor Market Opportunities

The unemployment rate in Puerto Rico has long been high and well above the rate for the U.S. mainland, suggesting that a significant share of the Island's labor is underutilized. Unemployment is particularly glaring for the young and less educated (**Figure 6**). For those aged sixteen to twenty-four, the unemployment rate is 39 percent, 19 percentage points higher than the U.S. rate. For those without a high school diploma, the rate is nearly 31 percent, well above the 16.5 percent rate for the U.S. mainland. The average unemployment rate falls with higher levels of educational attainment; nevertheless, the 8 percent unemployment rate for those with at least a bachelor's degree exceeds the U.S. rate of 5 percent.

Not only is the unemployment rate persistently high, but labor force participation is astonishingly low. Measures of labor force participation are particularly striking for young and uneducated workers, with a rate of roughly 35 percent for those aged sixteen to twenty-four and about 40 percent for those with less than a high school diploma (**Figure 7**). For workers at lower education levels, the gap in labor force participation rates between Puerto Rico and the U.S. mainland is large; however, even among those with a college degree, the gap remains significant.

While the reasons for high and persistent unemployment both in the aggregate and across various age and education groups in Puerto Rico are not fully understood, we focus on three factors that likely underlie this trend. First, Puerto Rico's minimum wage may well contribute to the lack of jobs for lower-skilled workers.¹² Most economists agree that a binding minimum wage reduces employment relative to levels that would exist in the absence of such a constraint. In Puerto Rico, the U.S. federal minimum wage applies even though the U.S. level is quite high relative to the wages the average worker could expect to earn on the Island. To put the level of the minimum wage in perspective, the annual salary of a full-time minimum wage worker is around \$15,000—roughly equivalent to Puerto Rico's income per capita in 2010, and similar to the median household's total income of about \$19,000. Overall, workers in Puerto Rico tend to earn about half as much as workers on the U.S. mainland and the median household income is 60 percent lower. Given this disparity, the level of the minimum wage is on a different scale in Puerto Rico than on the U.S. mainland. Further, the minimum wage is high relative to average worker productivity. According to a 2012 World Bank study, Puerto Rico ranked 160th out of 186 countries when judged by the ratio of the minimum wage to value added per worker. Puerto Rico's ratio was nearly double the ratio for the Bahamas and Jamaica, about three times that of the U.S. mainland, and roughly 6 times that of Mexico.¹³

¹² See Castillo-Freeman and Freeman (1992), Kreuger (1995), Davis and Rivera-Batiz (2006), and Enchautegui and Freeman (2006).

¹³ World Bank (2012).

When the minimum wage in Puerto Rico achieved parity with the U.S. level in 1983, 44 percent of the workforce in Puerto Rico was paid at or near the minimum.¹⁴ As of 2010, roughly one-third of workers in Puerto Rico earned the minimum wage, compared with just 16 percent for the U.S. mainland. Thus, the minimum wage affects a large share of workers in Puerto Rico and may be an important contributor to unemployment, especially for the young and less educated.

The negative consequences of Puerto Rico's high minimum wage may be particularly costly to younger workers. To the extent that young workers are priced out of the labor market, they will miss out on the opportunity to acquire on-the-job training early in their working lives. This lack of skill development can have a considerable impact on lifetime earnings. In addition, incentives for the young to stay in school may be diminished due to the lack of good job prospects when they complete their education and attempt to find a job.

Second, research points to a mismatch between the types of jobs that exist in Puerto Rico and the human capital level of its population.¹⁵ The current industry structure in Puerto Rico is relatively intensive in its use of highly educated workers compared with the average human capital level of its population. In part, this is traceable to the shifting of the Island's industry structure to relatively high-tech manufacturing as a result of local tax incentives and the incentives available to the Puerto Rico subsidiaries of U.S. firms under Section 936 of the IRS tax code.¹⁶ This change in industry mix created a shortfall in the demand for lower-skilled workers and may help explain high unemployment among the young and less educated.

Third, it appears that weak job creation in Puerto Rico, particularly in the private sector, has contributed to the persistently high unemployment rate. Many observers attribute this sluggish private sector job creation to an environment that is unfriendly to business development. In particular, as we explain in more detail below, businesses face burdensome permit and property registration processes as well as difficulties in enforcing contracts.¹⁷ This environment has made it hard for businesses to expand and create jobs.

Why is the participation rate of the Puerto Rican labor force so low? Again, the explanations for this trend are not completely understood, but recent research focuses on three key possibilities. First, a high unemployment rate and a sluggish pace of long-term economic growth dampen job prospects for potential workers. Consequently, discouraged workers may leave the labor force if they are unable to find work or if they believe jobs are not available. For example, an unemployment rate of nearly 40 percent for people aged sixteen to twenty-four may particularly depress the job-seeking efforts of younger workers.

Second, the Island's relatively large transfer payment system has likely had work-discouraging effects. Transfer payments constitute a significant share of income for residents—in Puerto Rico, such payments are roughly 40 percent of personal income, more than double the share for the U.S. mainland.¹⁸

Two programs warrant particular attention because they affect such a large segment of the Island's population. More than 1 million residents—a quarter of the Island's population—receive benefits

¹⁴ Castillo-Freeman and Freeman (1992).

¹⁵ Davis and Rivera-Batiz (2006).

¹⁶ These 936 tax incentives are discussed in more detail in a later section.

¹⁷ World Bank (2011).

¹⁸ See Statistical Appendix of the Economic Report for the Governor and Legislative Assembly, available at <http://www.gdb-pur.com/economy/statistical-appendix.html>.

through the Nutrition Assistance Program (NAP), Puerto Rico's version of the U.S. Supplemental Nutrition Assistance Program (SNAP, commonly referred to as Food Stamps). In addition to affecting such a large share of residents, this program provides a high level of benefits relative to what one could expect to earn in the Puerto Rican labor market. For example, in 2003 the average monthly NAP benefit per person was \$103, higher than the U.S. benefit of \$84 (via SNAP), despite wages that tend to be half as high as mainland wages.

The second transfer payment program that affects a significant share of the working-age population is Social Security Disability Insurance (SSDI). About 11.4 percent of the working age population receives disability payments, compared with 7.4 percent for the U.S. mainland. This difference suggests that disability rates in Puerto Rico are high and may be reducing labor force participation, either because people are unable to work or to find a job accommodative of their disability or because the opportunity to receive disability benefits discourages potential workers.

When combined with other sources of benefits available to low-income workers—Temporary Assistance for Needy Families (TANF), public health insurance, and housing subsidies—NAP and SSDI provide a significant share of residents with sizable funds relative to average incomes. Significantly, these transfer payments are reduced as one earns wages, and thus may result in a particularly high implicit tax on earnings. For example, research indicates that the effective tax rate on earnings for a single mother who decides to work may approach 100 percent or more when income from transfer payments is factored in.¹⁹ Some of this implicit tax has been offset by Puerto Rico's adoption in 2006 of the Worker's Tax Credit, which gives eligible workers a credit on their labor income to compensate for the reduction in benefits. However, the maximum amount of credit is currently only \$350 per year—a relatively modest sum even given Puerto Rico's lower average earnings. The sum is much smaller, even in relative terms, than what is offered by the comparable Earned Income Tax Credit in the United States.²⁰

The third explanation for low labor force participation is that the underground economy employs a large segment of the population. Indeed, estimates of its size are as high as 23 percent of GDP.²¹ Nonetheless, recent estimates suggest that the underground economy may explain only about 3 percentage points of the low labor force participation rate.²²

2. Developing Human Capital

There is no resource more important to an economy than the knowledge and skills—or human capital—of its people. It is well known that human capital increases productivity. Furthermore, the geographic concentration of human capital facilitates “knowledge spillovers”—the transfer of knowledge and skills from one individual to another. Indeed, research has consistently shown that regions with higher levels of human capital tend to be more innovative, and that workers in these regions tend to be more productive and earn higher wages.²³

In Puerto Rico, one of the most significant developments contributing to higher human capital over the past several decades has been a rapid increase in educational attainment, particularly at the college level.²⁴ In fact, Puerto Rico now has a higher college attainment rate than eleven U.S. states. On

¹⁹ Burtless and Sotomayor (2006).

²⁰ Center for New Economy, unpublished analysis.

²¹ Enchautegui and Freeman (2006).

²² Enchautegui and Freeman (2006).

²³ See Glaeser, Scheinkman, and Shleifer (1995); Moretti (2004); Carlino, Chatterjee, and Hunt (2007); and Abel and Gabe (2011).

²⁴ Ladd and Rivera-Batiz (2006).

average, working-age people in Puerto Rico have 12.5 years of education, or the equivalent of a high school diploma (Figure 8). This represents a sharp increase in educational attainment over the past several decades, and the Island is now relatively close to the level of education achieved on the U.S. mainland. At the same time, however, the share of the working-age population that has less than a high school degree is much larger in Puerto Rico than on the U.S. mainland—21 percent compared with 11 percent. And this group has fewer years of education than its U.S. counterpart, with an average of 6.9 years in contrast to 7.7 for the U.S. mainland. Thus, while the Island’s workforce overall is among the most educated in the world, there exists a dual market of the highly educated at one end of the spectrum and an unusually large segment of relatively low-skilled workers at the other end of the spectrum.

The implications of this picture can be seen in the strong positive correlation between the average years of education of a state’s adult working-age population and its income per capita (Figure 9). That is, places with more human capital tend to earn higher incomes. For example, in West Virginia, the working-age population has 12.9 years of education and its income per capita is about \$32,000. Meanwhile, in Massachusetts, where the working-age population averages 14.1 years of education, GDP per capita is more than \$51,000. More generally, small differences in the average education level correspond to sizable differences in income per capita.

In sum, these data suggest two things: First, that Puerto Rico’s human capital is underutilized, as illustrated by the Island’s position below the trend line; and second, that despite its progress, when compared with U.S. states, Puerto Rico still has a relatively low overall educational attainment and corresponding level of income.

Moreover, although Puerto Rico has made great strides in increasing the educational attainment of its population over the last several decades, there is a growing concern that the quality of its education system has deteriorated in recent years, particularly at the primary and secondary levels. While this concern appears to be widely held, systematic evidence documenting this trend remains limited. Much of the available research focuses on student achievement scores, which are difficult to compare over time or across places because of differences in proficiency standards and the underlying composition of test takers. That said, existing research focusing on the early 2000s indicates that less than half of Puerto Rico’s public school students were proficient in core subjects such as mathematics, Spanish, and English.²⁵ Moreover, as students progress through school in Puerto Rico, their proficiency in these core subject areas appears to decline rather than rise. These patterns are consistent with evidence from college entrance exams in Puerto Rico, which are available over a longer time period. From the mid-1990s to the early 2000s, average test scores in all subjects either did not improve or fell, with the largest decline occurring in mathematics. Thus, the evidence that does exist on student performance in Puerto Rico raises some concern about how well the Island’s education system is meeting the needs of its residents.

While educational attainment is an important dimension of human capital accumulation, people can acquire knowledge and skills in many other ways. As discussed earlier, one particularly important channel is through workforce experience. Thus, Puerto Rico’s high unemployment and exceptionally low labor force participation create additional labor market problems because they inhibit the development of the Island’s human capital stock, particularly among those with limited educational attainment.

²⁵ See Ladd and Rivera-Batiz (2006).

The significance of this problem is borne out by research indicating that residents of Puerto Rico have accumulated work experience at only 55 to 65 percent of the rate in the United States.²⁶ Moreover, when workers are unemployed for long periods of time or exit the labor force altogether, the skills they have acquired can erode or become outdated, making it difficult for these individuals to return to work.

3. Reducing the Costs of Doing Business

The quality of the microeconomic business environment is a key factor underpinning the competitiveness of firms and the economy in which they operate.²⁷ A growing body of research has shown that the quality of institutions and more broadly the ease of doing business are critical determinants of firm creation and economic growth.²⁸ Aspects of Puerto Rico's institutional framework—such as its credit infrastructure and protections afforded investors—position the Island roughly in line with the United States and more favorably than many of its regional peer competitors. However, high costs of doing business—including the time and cost involved in meeting certain business regulations, the elevated cost of a key business input (electricity), and an underdeveloped and costly transportation infrastructure—are well documented and often noted as impeding a more dynamic business environment.

a. Streamlining Business Regulations

Business leaders in Puerto Rico frequently cite excessive bureaucracy and red tape as key impediments to the establishment and growth of new businesses as well as the expansion of existing ones. Evaluations conducted by the World Bank and the World Economic Forum underscore some of the key strengths of the Puerto Rican business environment—centered primarily in the legal framework and sophistication of firms operating on the Island. But consistent with the anecdotal information gathered from local business leaders, the evaluations also suggest that certain regulatory processes are onerous and time consuming, and could be targeted for improvement.

The World Bank's annual "Doing Business" study evaluates the business environment across 183 economies, shedding light on how easy or difficult it is for a local entrepreneur to open and run a small- to medium-size business when complying with relevant regulations.²⁹ Puerto Rico ranks 43rd out of 183 economies, placing it ahead of virtually all of its regional peers but considerably behind the United States (ranked 4th). Across the indicators under evaluation, several aspects of Puerto Rico's business environment position it more favorably than its Latin American peers (and roughly in line with the United States): the time, procedures, and cost involved in starting and closing a business; investor protections; and the framework for getting credit. However, processes for obtaining construction permits and registering property in Puerto Rico take considerably more time and are more costly than in the United States and many Latin American countries. For example, it takes almost 200 days to obtain a construction permit and register property in Puerto Rico, in contrast to 12 to 26 days in the United States. Exacerbating the onerous permit process is the absence of a comprehensive land-use plan in many parts of the Island—a factor not cited in the World Bank study but noted by several local business leaders. Processes for trading across borders also appear to be more complex in Puerto Rico than in the United States (owing to the number of documents and time required for importing/exporting). While Puerto Rico scores relatively well in terms of the strength of legal rights for borrowers and lenders, the time and cost involved in enforcing contracts are roughly double those in the United States (and more in line with those of Puerto Rico's Latin American peers).

²⁶ Davis and Rivera-Batiz (2006).

²⁷ Porter (1990, 2004).

²⁸ World Bank (2003); Rodrik, Subramanian, and Trebbi (2004); Helpman (2004); World Bank (2005); Klapper, Lewin, and Delgado (2009).

²⁹ The "Doing Business" report evaluates ten indicator sets across 183 countries. The report provides quantitative measures of regulations for starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency—as they apply to domestic small- and medium-size enterprises.

The World Economic Forum's Global Competitiveness Index assesses countries across a range of factors thought to underpin national competitiveness, which is in turn defined as "the set of institutions, policies, and factors that determine the level of productivity of a country." The index is broader in scope than the World Bank's "Doing Business" study; it is based on ratings for 111 indicators across 12 key pillars and relies on a combination of survey data and third-party statistics.³⁰ Puerto Rico ranks 35th out of 142 economies in aggregate. Across all indicators, Puerto Rico scores highest—and largely above the sample mean—on those related to innovation and sophistication (intellectual property protection, production process sophistication, and the availability of scientists and engineers, among others). In contrast, and generally consistent with the World Bank evaluation, Puerto Rico scores lowest and is furthest from the sample mean on the burden of government regulation indicator. Other indicators relating to the regulatory environment and the cost of doing business on which Puerto Rico registers particularly low scores or falls below the mean include the business costs of crime and violence, transparency of government policymaking, hiring and firing practices, and favoritism in decisions of government officials. The World Economic Forum's Executive Opinion Survey shows that "inefficient government bureaucracy," "restrictive labor regulations," and "access to financing" are regarded by respondents as notable impediments to doing business in Puerto Rico.

b. Lowering Electricity Rates

The cost of electricity—a key business input across economic sectors—is significantly higher in Puerto Rico than in virtually all areas of the U.S. mainland. High electricity rates charged by the Puerto Rico Electric Power Authority (PREPA), a government-owned monopoly, have hurt the competitiveness of manufacturers in Puerto Rico and reduced the income that residents could spend on domestically produced goods and services. According to data from the Government Development Bank for Puerto Rico, the average retail rate was 27 cents per kilowatt hour for the year ending June 2011.³¹ The U.S. average was 10 cents per kilowatt hour and the New York average 16 cents per kilowatt hour.

Electricity rates are substantially higher than they are on the U.S. mainland in large part because 70 percent of generation is from oil. By comparison, only 1 percent of U.S. generation relies on oil. The cost disadvantage from relying on oil is substantial. Specifically, the per-unit cost of energy from oil was roughly twice the U.K. price for natural gas in July 2011 and four times the U.S. price. Additional factors behind high electricity rates include rising interest and principal payments on the large stock of PREPA debt and significant electricity theft.³²

c. Improving Transportation Infrastructure

Two key aspects of the transportation infrastructure are frequently mentioned as raising business costs and impeding business activity on the Island. One of these is the Jones Act, which affects Puerto Rico's outward and inward trade activity, and the other is an underdeveloped and inadequate local transportation infrastructure.

³⁰ The Global Competitiveness Index evaluates 142 countries across 12 pillars grouped into 3 categories: Basic Requirements (institutions, infrastructure, macroeconomic environment, and health and primary education); Efficiency Enhancers (higher education and training, goods market efficiency, labor market efficiency, financial market development, technological readiness, and market size); and Innovation and Sophistication Factors (business sophistication and innovation). The World Economic Forum in turn categorizes economies by stages of development, weighting factors in the index according to an economy's stage of development: Stage 1 (factor-driven), Stage 2 (efficiency-driven), and Stage 3 (innovation-driven). The Forum classifies Puerto Rico as a country in transition between Stage 2 and Stage 3.

³¹ See GDB presentation, "Natural Gas Diversification Strategy for Puerto Rico," available at <http://www.gdb-pur.com/documents/GNRoundtable-v2FINAL.pdf>.

³² Data for the utility can be found in a recent prospectus for PREPA revenue bonds (May 2010), available at <http://www.aeepr.com/INVESTORS/Financial%20Information/Official%20Statement/PREPA%20Revenue%20Bonds%20Series%20BBB.pdf>. A critical assessment of PREPA can be found in a research paper issued by the Center for the New Economy, "Darkness Visible: A Financial Analysis of the Puerto Rico Electric Power Authority," available at http://aceer.uprm.edu/pdfs/darkness_visible_june_2010.pdf.

The Merchant Marine Act of 1920, known as the Jones Act, requires that all goods shipped or passengers conveyed by water between U.S. ports (including Puerto Rico) be carried in U.S. flagships, constructed primarily in the United States, owned by U.S. citizens, and crewed by U.S. citizens and permanent residents.³³ While the Jones Act is often cited as a factor that raises business costs, there is no comprehensive, objective study assessing its potential effects on Puerto Rico's shipping costs or the Island's economy as a whole.³⁴ Experts on the Island have varying views on the magnitude of the act's effect, but most agree that the net effect is negative—largely because the act boosts the cost of imported goods to Island residents but also because it makes exports less competitive and diminishes the viability of the Island as a major regional trans-shipment port.³⁵ However, some in the shipping industry argue that the net effect is minimal—that the restrictions effectively help establish incentives for more reliable service and create jobs for American workers, many of whom are Puerto Ricans themselves, largely offsetting the adverse effects of higher costs.³⁶

Available data show that shipping is more costly to Puerto Rico than to regional peers and that Puerto Rican ports have lagged other regional ports in activity in recent years. While causality from the Jones Act has not been established, it stands to reason that the act is an important contributor insofar as it reduces competition (shipments between the Island and the U.S. mainland are handled by just four carriers). It costs an estimated \$3,063 to ship a twenty-foot container of household and commercial goods from the East Coast of the United States to Puerto Rico; the same shipment costs \$1,504 to nearby Santo Domingo (Dominican Republic) and \$1,687 to Kingston (Jamaica)—destinations that are not subject to Jones Act restrictions.³⁷ More broadly, it should be noted that shipping costs between the commonwealth and the U.S. mainland are much more stable than international market-driven rates. Thus, the incremental cost varies over time and is most pronounced when there is excess worldwide shipping capacity or when oil prices are low. Furthermore, over the past decade, the port of Kingston in Jamaica has overtaken the port of San Juan in total container volume, despite the fact that Puerto Rico's population is roughly a third larger and its economy more than triple the size of Jamaica's. The trends are stark: between 2000 and 2010, the volume of twenty-foot containers more than doubled in Jamaica, while it fell more than 20 percent in Puerto Rico.³⁸

Pending the outcome of further studies—including the recently announced study of the Jones Act by the U.S. Government Accountability Office (GAO)—it would appear that, to the extent that it inhibits free trade, the Jones Act does indeed have a negative effect on the Puerto Rican economy, although the magnitude of the effect is unclear. Some have advocated seeking an exemption, arguing as a precedent that the nearby U.S. Virgin Islands have been exempt from Jones Act restrictions since 1922.

Another challenge on the transportation front, with significant implications for the manufacturing sector, relates to the Island's transportation infrastructure. While Puerto Rico's extensive network of roads and highways compares favorably with that of regional peers, the quality of the roads and the degree

³³ The purpose of this legislation was to ensure that the United States would maintain a viable merchant marine fleet that could be depended on in times of emergency or war and to protect the shipbuilding industry. The act also ensures that workers on intra-national trips are subject to certain legal protections comparable to those of other U.S. workers. The Jones Act has particular relevance for places like Puerto Rico (as well as Hawaii) that are heavily dependent on water transportation of goods to and from the U.S. mainland.

³⁴ The GAO conducted a comprehensive study in 1988 that estimated the impact of the Jones Act on Alaska, pegging the cost at \$36.6 million per year at that time: see <http://www.gao.gov/products/RCED-88-107>. Separately, a 1999 study conducted by the U.S. International Trade Commission estimated that the "net change in economic welfare" from elimination of the Jones Act would amount to \$656 million for the United States as a whole (just eliminating the U.S. shipbuilding requirement would lead to an estimated increase of \$261 million).

³⁵ The focus is on imports because ships traveling northbound from Puerto Rico to the U.S. mainland typically have excess capacity (since imports exceed exports) and costs are lower. However, the cost of exporting goods may also be higher than would otherwise be the case.

³⁶ See <http://www.jonesactquestions.com/professional-mariner/288-jones-act-good-for-puerto-rico.html>.

³⁷ See http://puerto-rico.shipping-international.com/rates/san_juan/ and <http://dominican-republic.shipping-international.com/rates/santo-domingo/>.

³⁸ See <http://data.worldbank.org/indicator/IS.SHP.GOOD.TU>.

of traffic congestion are considered to be inferior to their U.S. mainland equivalents. In addition, the only freight rail is a short line at the Port of Ponce. The lack of freight rail has limited competition for the transportation of goods across the Island. Puerto Rico is thus highly dependent on the trucking industry for the movement of goods, and trucking costs—the anecdotal evidence suggests—are high. The project to convert the Port of Ponce into a deep-water megaport—Port of the Americas—could exacerbate this reliance, with goods arriving at Ponce needing to be trucked to the north (the main population center).

4. Mobilizing Finance for Business Development and Growth

A sound financial system that efficiently transforms savings into productive investments is a crucial feature of a well-functioning economy and essential for competitiveness. However, both cyclical and longer-term challenges are dampening credit availability to local businesses in Puerto Rico. Bank condition and performance deteriorated sharply in recent years following a boom and bust in real estate lending, leaving banks risk averse and poorly positioned to lend. Loan demand is tepid given Puerto Rico's weak economic outlook, and collateral values have declined significantly, making it more difficult for prospective borrowers to qualify for loans. Over the longer term, banks have faced challenges in growing their core deposit base, particularly given the crowding-out effects of the government's substantial funding needs. As a result, banks have relied on non-core-deposit funding sources, the availability of which has become increasingly constrained. Together, these factors suggest a protracted period of bank deleveraging in Puerto Rico that will continue to weigh on economic activity. Limited alternatives to bank funding for local businesses raise the importance of a recovery in banking system condition and performance and of efforts to cultivate other private financing mechanisms.

Puerto Rico's private commercial banks are the primary intermediaries of credit on the Island (**Figure 10**); however, these institutions are poorly positioned to lend in the current economic environment following a significant credit run-up and substantial asset quality erosion.³⁹ Bank credit penetration increased by roughly 36 percentage points of the Island's GNP from 2000 to 2005, driven primarily by lending to the real estate and construction sector (**Figure 11**). Bank loan portfolios have contracted for three years through December 2011, although the pace of contraction has slowed in recent quarters (**Figure 12**).⁴⁰ The banking sector has experienced considerable consolidation in recent years, particularly following the failure and subsequent acquisition of three banks in 2010, which has contributed to the pullback in credit intermediation.⁴¹ In a positive sign, commercial, industrial, and agricultural lending, which historically has lagged, rebounded notably last year, ahead of other segments.

Banks have experienced sharp asset quality deterioration, particularly in their residential construction loan portfolios, and a significant overhang of problem loans continues to weigh on sector performance. Nonperforming loans as a percentage of total loans rose to more than 18 percent at the end of 2010, and while there has been moderate improvement in consumer and commercial segments in 2011, banks continue to see real-estate-related nonperforming loan ratios rise (**Figure 13**).⁴² Banks' historically low loan loss reserve coverage remains below 25 percent of nonperforming loans, and weak profitability

³⁹ Puerto Rico's financial system comprises eleven types of financial institutions with combined assets of more than \$172 billion as of December 2011. Eleven private commercial banks and two government banks—the Government Development Bank for Puerto Rico (GDB) and the Economic Development Bank for Puerto Rico (EDB)—represent more than half of financial system assets. International banking entities (IBEs) authorized to engage in offshore activity in Puerto Rico account for roughly a quarter of system assets, although their role in local credit intermediation is restricted except in special cases.

⁴⁰ Despite the ongoing process of deleveraging, private commercial banks maintain fairly deep credit penetration when measured as a percentage of GNP (81 percent as of the end of 2010). However, the bulk of outstanding loans have been issued to the real estate sector (more than 52 percent of GNP), with commercial, industrial and agricultural loans representing 16 percent of GNP.

⁴¹ In April 2010, Westernbank, Eurobank, and R-G Premier Bank were closed by the Federal Deposit Insurance Corporation and sold to Banco Popular, Orientalbank, and Scotiabank, respectively. The banking sector is relatively concentrated, with the three largest banks now accounting for roughly 70 percent of system deposits and 61 percent of system assets and the largest institution, Banco Popular, more than double the size of its closest competitor.

provides limited scope for increased provisioning in the near term. Capitalization ratios have improved (to 10.2 percent at the system level as of December 2011, from 6.7 percent in mid-2008), supported by equity raising, continued deleveraging, banks' recent return to profitability, and the participation of Popular Inc. and First Bancorp in the U.S. Treasury Department's Troubled Asset Relief Program (TARP).⁴³ However, the outlook for bank earnings remains weak given continued high credit costs, contracting loan portfolios, and challenging funding dynamics.

Because real estate is the most common form of collateral for many businesses, declining real estate values represent additional challenges for borrowers attempting to qualify for a loan. According to a Federal Housing Finance Agency purchase-only index, house prices on the Island have fallen 13 to 14 percent from 2007 peak levels through the end of 2011. This compares with a 19 to 20 percent drop in house prices on the U.S. mainland over the same period. Anecdotal evidence suggests that real estate values in certain markets in Puerto Rico have declined more than 20 percent.

From a longer-term perspective, access to various non-core-deposit funding sources over the past three decades allowed Puerto Rico's banks to expand lending significantly beyond the reach of their core deposit bases. More recently, limits on this type of funding have contributed to bank deleveraging and suggest that banks' capacity to lend could be constrained for some time to come. Additionally, Puerto Rico's sizable government financing needs have crowded out private investment and hindered local capital market development. Attractive offers from investment companies (mutual funds) have further intensified competition for local savings, contributing to persistently high deposit rates.⁴⁴

Deposits from the operations of foreign multinational corporations taking advantage of the Section 936 tax incentives provided key support to bank liquidity from the late 1970s to the late 1990s, representing almost 35 percent of total bank liabilities in 1995. The rollback of these tax incentives, beginning in 1996, prompted a shift to brokered deposits (**Figure 14**). In recent years, regulators have taken steps to curtail banks' reliance on brokered deposits (including through the Prompt Corrective Action framework), introducing renewed constraints on bank lending capacity. Excluding 936 and brokered deposits, the system's loan-to-deposit ratio reached as high as 175 percent in 2007, dropping to around 130 percent last year.

Alternatives to bank funding of local businesses in Puerto Rico are currently limited, underscoring the challenge that firms face obtaining finance against the backdrop of current and longer-term bank constraints. While investment companies and credit unions have gained market share over the past decade, these entities still represent a small percentage of financial system assets, with the former largely deploying assets under management to government securities and the latter focused primarily on consumer lending. Venture capital and private equity are also relatively scarce on the Island. Both government and private sector initiatives—such as direct lending and guarantees by Puerto Rico's two government banks,⁴⁵ U.S. Small Business Administration and Export-Import Bank loan programs, and private sector capacity-building initiatives such as Grupo Guayacán, Inc.—have helped mitigate financing constraints, but mainly at the margin.

⁴² Nonperforming loans are defined as loans ninety days or more past due and loans in nonaccrual status.

⁴³ Popular, Inc., is the parent company of Banco Popular de Puerto Rico.

⁴⁴ There are approximately forty-five investment companies in Puerto Rico, with assets under management totaling roughly \$34 billion as of December 2011.

⁴⁵ The Economic Development Bank for Puerto Rico administers various programs to support small and medium-sized enterprises, including direct lending and credit guarantees, some offered in conjunction with the Small Business Administration. The Government Development Bank for Puerto Rico administers various programs aimed at stimulating economic development. Two recent GDB initiatives include the April 2012 launch of the Puerto Rico Development Fund Loan Guarantee Program, which has received commitments from participating banks for \$800 million in new, refinanced, and restructured loans during the first year of the program, and the Desarrollo para el Pueblo program, which targets municipalities with unemployment rates exceeding 20 percent and engages with local authorities to provide firms with technical assistance and access to funding.

5. Lowering Dependence on a Shrinking Industry

For more than fifty years, the government of Puerto Rico has relied on tax incentives to drive its industrial development policy. These incentives exempted income from foreign-owned firms from the corporate income tax, and attracted foreign capital to the Island, primarily from U.S.-based multinational firms. These investment incentives were greatly enhanced by a series of federal government tax incentives that encouraged investment in U.S. possessions and territories.⁴⁶ Specifically, the federal incentives in the U.S. Tax Reform Act of 1976, which were part of Section 936 of the IRS tax code, significantly reduced the federal corporate taxes paid by U.S. multinationals on their earnings from their Puerto Rico operations.

The incentives were particularly attractive to U.S. pharmaceuticals firms because they allowed these firms to redirect some of their worldwide earnings from patents and trademarks to the Island and then repatriate their profits virtually tax free. Firms in the textile and electronics industries also took advantage of these tax incentives. The phasing out of the federal income tax incentives for Puerto Rico-based subsidiaries began in the mid-1990s and was largely completed by 2005. At that time, a number of these “936 corporations” changed their status to controlled foreign corporations, or CFCs, and this status has enabled them to continue to receive some federal tax advantages while located on the Island.⁴⁷

Despite the tax advantages made available to mainland pharmaceuticals and electronics firms, employment in the Island’s manufacturing sector is shrinking. The sector’s share of total employment on the Island fell from about 17 percent in 1990 to about 9.4 percent in 2010, a loss of almost 80,000 jobs and a larger percentage decline than occurred on the U.S. mainland. Chemicals, largely pharmaceuticals, remain the Island’s largest manufacturing industry, though that industry has been the source of a substantial share of the decline (**Figure 15**). A number of reasons have been cited for this shrinkage, including the phasing out of the 936 tax benefits, the loss of patents on certain items produced on the Island, escalation of costs (particularly electricity), and stiffening international competition. The pharmaceuticals sector retains a strong presence on the Island, and the Balance of Payments account for 2010 shows a still-sizable transfer of income out of Puerto Rico (**Figure 16**).

The specialization in pharmaceuticals provided support to employment on the Island while the industry was expanding; it not only increased employment opportunities, but also provided relatively high-skilled jobs. But with employment in the industry facing increased pressure from a number of sources, there appears little prospect of regaining a significant share of the jobs that have been lost. Moreover, while the incentives have channeled the Island’s labor and domestic and foreign capital resources to relatively high-value-added production for export to the U.S. mainland, this concentration of resources has occurred artificially.⁴⁸ To a significant degree, the economy of the Island is now vulnerable to further weakness in this formerly key sector.

⁴⁶ Almost all of these tax incentives were taken up by firms operating in Puerto Rico.

⁴⁷ In 2007, for example, average value added per worker there was \$630,000; in the pharmaceuticals industry, the average value added reached \$1.6 million. These figures are more than eight times the comparable figures for the U.S. mainland.

⁴⁸ See Pelzman (2002).

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Figure 6. Unemployment Rates: Puerto Rico and the United States
Percent

2010	United States	Puerto Rico	Difference
Total	10.7	19.2	-8.4
By age cohort			
16-24	20.4	39.0	-18.7
25-34	10.9	20.3	-9.4
35-44	8.9	17.1	-8.2
45-54	8.5	14.9	-6.4
55-64	8.2	10.8	-2.6
By education level (ages 25 to 64)			
Less than high school graduate	16.5	30.8	-14.3
High school graduate	11.8	21.9	-10.2
Some college	8.8	14.9	-6.1
Bachelor's degree or more	4.9	8.0	-3.0

Sources: 2010 Census (American Community Survey); Puerto Rico Community Survey.

Figure 7. Labor Force Participation Rates: Puerto Rico and the United States
Percent

2010	United States	Puerto Rico	Difference
Total	65.4	47.5	17.9
By age cohort			
16-24	58.2	35.5	22.7
25-34	83.9	74.3	9.5
35-44	84.0	75.0	9.0
45-54	81.7	62.7	19.0
55-64	64.8	35.1	29.7
By education level (ages 25 to 64)			
Less than high school graduate	62.9	39.1	23.8
High school graduate	75.8	56.5	19.3
Some college	81.6	70.2	11.4
Bachelor's degree or more	86.3	81.2	5.2

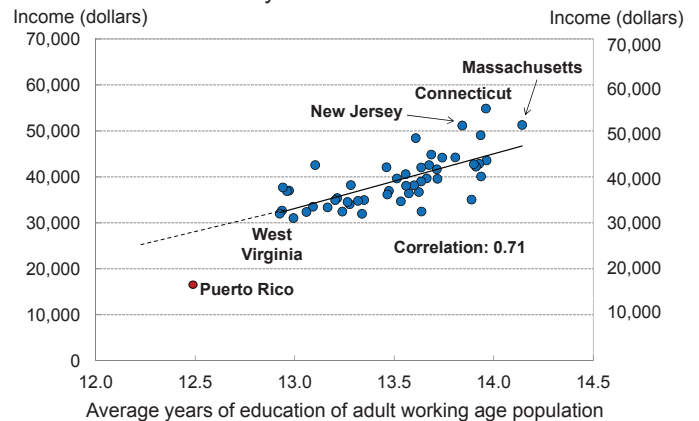
Sources: 2010 Census (American Community Survey); Puerto Rico Community Survey.

Figure 8. Educational Attainment: Puerto Rico and the United States

2010	United States	Puerto Rico	Difference
Average years of education (ages 25 to 64)	13.5	12.5	1.0
Percentage distribution, by education level			
Less than high school graduate	10.9	21.0	-10.1
High school graduate	35.0	30.4	4.6
Some college	24.2	23.3	0.9
Bachelor's degree or more	29.9	25.3	4.6
Average years of education, by education level			
Less than high school graduate	7.7	6.9	0.8
High school graduate	12.1	12.0	0.1
Some college	13.7	13.7	0.0
Bachelor's degree or more	16.8	16.7	0.2

Sources: 2010 Census (American Community Survey); Puerto Rico Community Survey.

Figure 9. Human Capital and Income Per Capita: Puerto Rico and the Fifty States



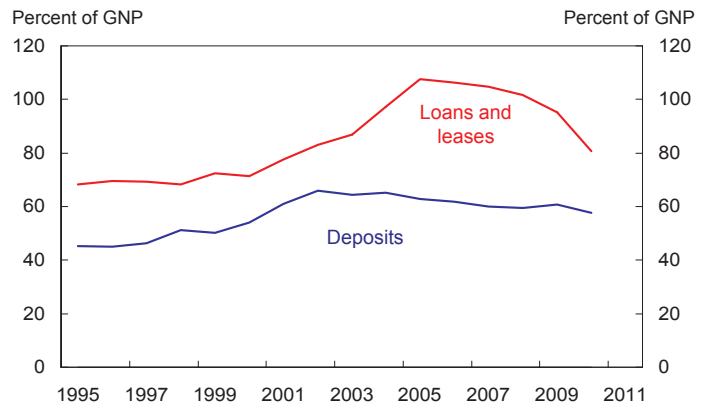
Sources: 2010 Census (American Community Survey); U.S. Bureau of Economic Analysis; Puerto Rico Planning Board.

Figure 10. Types of Financial Institutions: Puerto Rico
Percentage of System Assets, Except As Noted

	2011	2010	2007	2000	1997
Commercial banks	39.6	43.1	41.6	38.2	35.8
International/offshore bank entities	25.5	24.1	35.9	35.8	31.5
Government banks	11.2	9.8	5.3	5.7	7.9
Investment companies	8.9	8.4	6.7	1.9	1.9
Credit unions	4.6	4.5	3.1	3.6	4.6
Securities brokers	3.2	3.5	0.6	4.2	7.1
Mortgage institutions	3.2	2.8	2.8	3.8	2.7
Finance companies	2.4	2.3	2.2	3.8	4.0
Leasing companies	0.9	1.0	1.3	1.0	1.4
Small-loan companies	0.4	0.4	0.7	1.8	3.0
Venture capital funds	0.0	0.0	0.0	0.1	0.1
Total assets (millions of U.S. dollars)	172,029	168,214	211,437	123,534	83,637

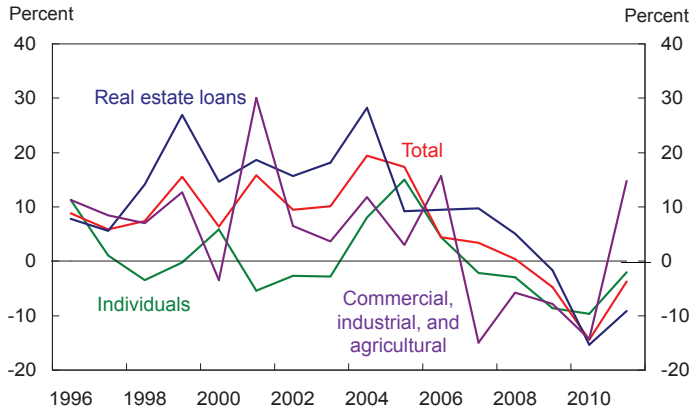
Source: Office of the Commissioner of Financial Institutions.

Figure 11. Bank Credit and Deposit Penetration: Puerto Rico



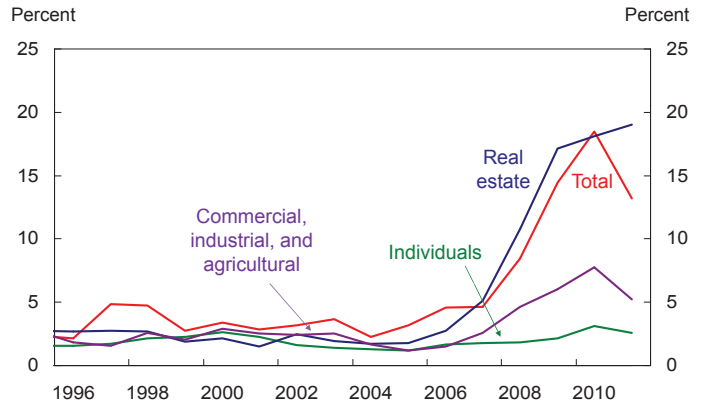
Source: Office of the Commissioner of Financial Institutions.
Note: Deposits do not include brokered and 936 deposits.

Figure 12. Commercial Bank Credit Growth: Puerto Rico
Annual Change, Nominal



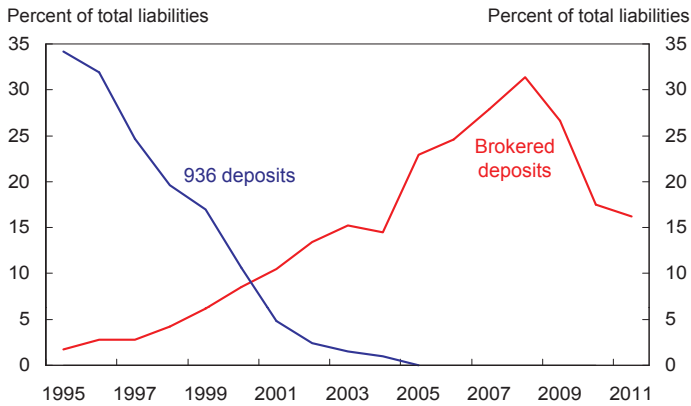
Source: Office of the Commissioner of Financial Institutions.

Figure 13. Commercial Bank Nonperforming Loans: Puerto Rico
As a Percentage of Total Loans, by Segment



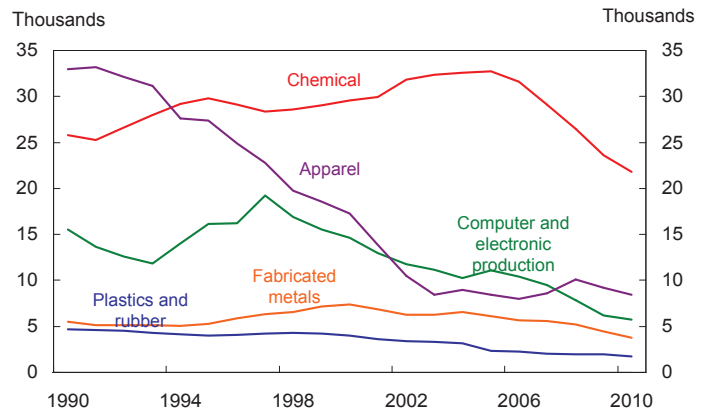
Source: Office of the Commissioner of Financial Institutions.

Figure 14. Brokered and 936 Deposits: Puerto Rico



Source: Office of the Commissioner of Financial Institutions.

Figure 15. Employment within the Manufacturing Sector:
Puerto Rico



Source: U.S. Bureau of Labor Statistics.
Note: Data are annual.

Figure 16. Balance of Payments: Puerto Rico, 2009

Exports	73,739.2
Merchandise	66,077.6
Transportation	475.9
Visitors' expenditures	3,472.8
Miscellaneous services	2,554.3
Income on investments	1,158.6
Imports	87,629.8
Merchandise	48,285.6
Transportation	2,195.6
Travel expenditures	1,106.1
Miscellaneous services	1,226.5
Income on investments	34,816.0
Balance on merchandise transactions	17,792.00
Balance on services	1,974.80
Balance on investment income	(33,657.40)

Source: Puerto Rico Planning Board.

IV. POLICY RECOMMENDATIONS

Puerto Rico has made noteworthy efforts in recent years to address many of the challenges outlined in the previous section, but more can be done to improve the Island's growth prospects. In this section, we provide a set of recommendations to help improve Puerto Rico's competitiveness, many of which are already being actively discussed and debated on the Island. These recommendations are not meant to be all-inclusive. They fall into five categories:

1. Reduce barriers to job creation and labor force participation.
2. Reform the energy industry.
3. Lower the costs of doing business.
4. Foster partnerships between industry and higher education.
5. Promote independent policy evaluation.

In our view, progress in these areas will help the economy more fully utilize its resources and support growth going forward.

Recommendation 1: Reduce Barriers to Job Creation and Labor Force Participation

Puerto Rico's labor market is characterized by high unemployment and low labor force participation, particularly among the Island's young and less educated. Thus, creating jobs and encouraging active participation in the labor market, especially for this highly affected group, is among the most significant challenges facing Puerto Rico and a top priority for policymakers. In particular, we recommend focusing on policies that address problems related to the Island's relatively high minimum wage and that improve incentives to work by modifying the structure of entitlement benefits.

The minimum wage may be especially damaging to the prospects of young and relatively unskilled workers. In fact, the 40 percent unemployment rate and 36 percent labor force participation rate among 16-to-24 year olds suggest that the effects of the minimum wage may be particularly detrimental to this group. Clearly, opportunities for young workers are quite limited, and they are in danger of becoming disconnected from the labor market over the long term.

A first step in addressing the Island's relatively high minimum wage could be to create a young-worker subminimum wage. Such a strategy would target workers under the age of 25, lowering the minimum for these workers to a fraction of the current federal minimum wage for some period of time when they start with a new employer. This would be a significant extension of the current "youth subminimum" wage, which can be paid to workers 18 years of age and younger for their first ninety days of employment. The new lower minimum would create an incentive for firms to hire younger workers and provide training at early stages of their working lives.

Firms often face a fair degree of risk when employing young workers who are relatively new entrants to the labor market because these workers frequently lack work experience or the basic skills necessary to perform a job. The advantage for firms of a young-worker subminimum wage is that it reduces the cost of labor for workers whose productivity may be low, creating an incentive for employers to hire newer entrants in the labor market. As these younger workers build skills and gain experience with a particular

employer over time, the training wage would be increased to match their improved productivity. These wage increases should be gradual and would occur during regular intervals as the worker continues employment with a given firm so that the worker's wage would be increased to the federal minimum over a number of years.

At the same time, Puerto Rico might consider reexamining the structure of its entitlement programs to address work-discouraging effects. The combination of benefits from multiple means-tested programs can create high effective marginal tax rates on earnings should a beneficiary decide to work. The design of these benefits structures, including their interrelationships, should be assessed to look for ways to improve incentives to seek employment. In addition, Puerto Rico's high rate of disability benefits warrants a review to ensure that the Social Security disability program is being appropriately utilized and does not encourage abuse. The process for approving disability benefits should be reviewed.

If these policies proved successful in improving employment rates and overall economic outcomes, a policy to address problems associated with the high minimum wage more generally could be considered. Because Puerto Rico's productivity has not kept pace with that of the U.S. mainland economy, continued upward adjustments to the minimum wage tied to increases on the mainland will increasingly limit job opportunities on the Island. One option would be to reduce the minimum wage on the Island. This step could be offset by increasing Puerto Rico's earned income tax credit. Together, these actions could leave minimum wage workers with the same net income they had before, but increase job opportunities for workers currently priced out of the market. Another option would be to freeze the minimum wage in Puerto Rico in nominal terms for a period of time to allow productivity on the Island to catch up, independent of any changes to the minimum wage on the U.S. mainland. Again, if policymakers desired to continue to increase the after-tax income of low-paid workers, they could expand the earned income tax credit while holding the minimum wage constant.

Recommendation 2: Reform the Energy Industry

Best practice suggests that a regulatory commission should be set up to oversee the Puerto Rico Electric Power Authority (PREPA) to protect consumers and improve the efficiency of the utility's operations. It is standard practice for a monopoly utility to be subject to regulatory commission oversight, even when the utility is owned by the government. The commission would have complete access to internal accounting records and would protect consumers by monitoring the cost of generating, transmitting, and distributing electric power. Reviewing and publishing information about the utility's operating efficiency are particularly important because PREPA has the legal authority to pass its costs on to customers—an arrangement that reduces the utility's incentive to manage these costs aggressively.

The commission would make sure that rates are set in an equitable and transparent fashion. PREPA currently provides subsidies, credits, and special rates to selected users. These arrangements should be reexamined by the commission since lowering the rates for some customers raises rates on others. Uniform rates should be the standard, except in cases where rate differences compensate for differences in the cost of delivery. The commission would also evaluate investment spending plans with an eye to maintaining PREPA's financial stability.

It is critical that the commission be politically independent and transparent in its operations, while subject to an appeals process as a check on its power. Members of the commission should meet high minimum technical qualifications, and the applicant pool should include candidates from outside of Puerto Rico to help increase the quality of the members selected. Salaries should be high enough to attract qualified candidates. Legislative efforts to establish a commission have been debated in recent years; such legislation should be evaluated in terms of how much it reduces the influence of the executive and legislative branches on PREPA management.

The commission would help oversee a shift from oil to natural gas for electricity generation—a move that is compelling in cost terms. The cost advantage of natural gas relative to oil is substantial; success in moving to natural gas will therefore result in significant gains for the Island's economy. There have been discussions of a natural gas pipeline as well as offshore gas terminals that would expand the number of generation facilities that have access to natural gas supplies. Unfortunately, these alternatives are controversial, and the merits of the concerns raised by opponents are beyond our area of expertise to evaluate. Resolving this issue in a timely manner would reduce uncertainty for potential investors in the Puerto Rican economy.

The development of a renewable-energy industry would also help reduce the Island's reliance on oil. Replacing oil imports with domestically produced energy would keep money on the Island, boosting income and jobs instead of going to foreign suppliers. The government has passed legislation to encourage renewable energy, and the 2011 White House report on Puerto Rico contains numerous ideas on how to foster its growth.⁴⁹

The regulations that will govern how independent power producers sell into the electricity grid are currently under discussion. It is important that the set-up adopted be attractive to renewable-energy producers. In the United States, access to the grid is determined by the Federal Energy Regulatory Commission (FERC). Puerto Rico is not under FERC's jurisdiction because electricity does not cross state lines, but the government could adopt the wholesale market rules set by FERC that govern access to the grid and give the new regulatory commission the authority to implement these rules. Alternatively, the U.S. Congress could be asked to pass legislation to make Puerto Rico subject to FERC authority in matters relating to grid access. Adopting established U.S. procedures would speed the development of renewable energy by clarifying how it will be sold to PREPA. It would also help ensure that PREPA was appropriately open to use of non-PREPA sources of electricity.

Recommendation 3: Lower the Costs of Doing Business

Excessive bureaucracy and red tape are frequently cited by local business leaders as impediments to a more dynamic business environment in Puerto Rico. It is difficult to obtain concrete, comparative measures of the extent of bureaucracy and red tape across the full range of regulations with which businesses must comply. However, studies and surveys by the World Bank and the World Economic Forum indicate that Puerto Rico significantly lags the United States and many regional peers in the time and cost involved in obtaining permits and registering properties as well as in perceptions of the burden of government regulation and the efficiency of government bureaucracy.

⁴⁹ President's Task Force on Puerto Rico, March 2011. See http://www.whitehouse.gov/sites/default/files/uploads/Puerto_Rico_Task_Force_Report.pdf.

The Puerto Rican government has implemented several measures in recent years aimed at improving the business climate, including creating a new, streamlined system for issuing permits, providing access to certain government services online (such as tax filing certificates or procedures for starting a business), and merging and streamlining procedures to name and register new companies. The measures related to issuing permits have, for example, reduced the time (to 189 days, from 208) and cost (to 369 percent of per capita income, from 500 percent) involved in obtaining construction permits, as calculated in the World Bank’s “Doing Business” 2011 report. Nevertheless, Puerto Rico continues to lag the United States and many of its regional peers on this metric. A systematic effort to continue streamlining regulatory processes, including specific targets and deadlines developed in consultation with the business community, could provide a needed boost to perceptions of the business climate and translate into a more dynamic and attractive business environment.

Shipping goods to and from Puerto Rico costs considerably more than shipping to and from the Island’s regional peers, imposing an important cost on Puerto Rican businesses and dampening the economy’s competitiveness. Much of this relatively high cost of shipping is widely attributed to the Jones Act. Moreover, Jones Act restrictions may put the Port of Ponce at a competitive disadvantage in its potential role as a major trans-shipment port. As an island economy, Puerto Rico differs from the mainland in that it has few alternatives to shipping for the bulk transportation of goods, so it represents a unique case with respect to the Jones Act.

There have been few systematic empirical efforts to decompose the causes of the Island’s high shipping costs. However, economic theory suggests that in the case of Puerto Rico, greater competition would reduce shipping costs, increase efficiency in import-related sectors, and improve export competitiveness. The recently announced review of the Jones Act by the GAO represents an important step toward clarifying the drivers of Puerto Rico’s high shipping costs and identifying further policy options to address the issue. A temporary exemption from the Jones Act—for a period of perhaps five years—could potentially be warranted. During this period, trends in shipping costs, volumes, and business practices could be monitored; at the end of the period, a review could assess the costs and benefits to determine if this exemption should be made permanent.

Recommendation 4: Foster Partnerships between Industry and Higher Education

Colleges and universities are important assets that can help their regions actively participate in the knowledge economy. Not only do these institutions produce highly skilled labor, they contribute directly to innovation by creating new knowledge and inventions through research and development (R&D) activities. Puerto Rico already has a respected and well-established higher education industry. One way that it can build on this asset is to continue to foster partnerships between private industry and higher education institutions. Successful partnerships can provide localized economic benefits by increasing economic activity through the creation, development, and commercialization of new products or processes. Indeed, these partnerships have proved to be an effective way for regions to promote innovation, entrepreneurship, and ultimately, economic growth.⁵⁰

⁵⁰ See, for example, National Academies (2002); State Science and Technology Institute (2006); and Abel and Deitz (2011, 2012).

We believe a high priority should be given to establishing a university-based center of excellence focused on developing globally important technologies with connections to industries already located on the Island. The presence of such research centers helps attract federal research funding and makes it easier to recruit top research faculty. Moreover, centers of excellence allow businesses to utilize university knowledge and research facilities to create products and services. The government of Puerto Rico or a non-profit institution would provide seed funding for this initiative and, given the critical role of industry participation in the formation of such research centers, provide matching funds for every dollar of private sector investment. It is important that such funding be provided on a consistent and ongoing basis. Not only will such investments help increase the amount of research and development occurring on the Island, but securing industry participation will help steer these research efforts toward projects with the most promising commercial applications.

While building a strong research base is a necessary step in any innovation-based economic development strategy, the potential economic benefits of such efforts are only fully realized if the knowledge created reaches the market. Therefore, we further recommend that the commercialization of intellectual property created through industry-higher education partnerships be supported. One way to bolster such support is to more fully develop technology transfer offices in the Island's research universities to harness the synergies between university research and commercial product development. It is also important to provide opportunities for informal networks to arise that would spur the exchange of ideas, foster collaborative endeavors, and promote the formation of spin-off companies. Further, we recommend reviewing the incentive structure that exists within the Island's universities in an effort to identify changes that would encourage and reward faculty who engage in commercially viable research activity.

With its highly skilled workforce and existing colleges and universities, Puerto Rico already has many of the ingredients in place to harness the economic benefits of industry-higher education partnerships. In particular, the strong concentration of science and engineering activities at the University of Puerto Rico at Mayagüez and the cluster of activities in health-related fields at the University of Puerto Rico Medical Sciences Campus make these prime locations for enhancing partnerships with private industry. Nonetheless, the specific types and locations of industry-higher education partnerships likely to succeed in Puerto Rico are difficult to judge in advance. Therefore, an important initial step in this process might be the creation of a task force to identify the most promising opportunities for mutually beneficial collaboration between industry and higher education. The task force would include members of academia, industry, the non-profit sector, and government.

Recommendation 5: Promote Independent Policy Evaluation

The four recommendations presented above do not exhaust the issues that affect the competitiveness of Puerto Rico's economy. Economic policymakers considering how best to improve the Island's competitiveness continually face decisions on a host of proposals with both immediate and longer-term impact. In fact, the Island's growth potential will be influenced by the decisions made on a range of issues. To this end, a broadening of the quality and scope of economic data can play a critical role in informing the economic debate on the Island and in helping to evaluate the merits of various options. Expanded assessment efforts and better data will help ensure that the best ideas have a chance to be adopted while those found lacking are eliminated.

Policymakers on the Island already conduct some forms of cost-benefit analysis, but the analysis could be carried out more systematically, with the results more widely disseminated. Ideally, an independent government agency should have the resources to supply this type of analysis to the public. For example, an independent authority could quantify the cost of tax incentives given to industry to support growth. Having a better measure of the amount of tax benefits granted would help policymakers judge the cost effectiveness of the programs. An evaluation across industries would also reveal if the tax policy is distorting economic activity in unintended ways. One option would be to expand the operations of the Office of the Comptroller, which currently audits government agencies to ensure that they perform according to laws and regulations and to identify waste and illegal activities. Another option is to create a publically funded agency similar to the Independent Budget Office of the City of New York.

In addition, the quality of government policies depends on accurate and timely economic and demographic data. However, such data are in short supply on the Island. Even statistics on payroll employment, labor force participation, and unemployment—generally deemed to be the most reliable and informative monthly economic indicators—tend to be substantially more volatile than do parallel data for the states on the U.S. mainland. In addition, many useful economic indicators pertaining to the U.S. mainland are simply not available for Puerto Rico or are still being developed—for example, measures of home prices, home sales, commercial vacancy rates, and consumer confidence. More resources should be devoted to improving and expanding data collection. One good example of a recently developed indicator is the survey of purchasing managers in the manufacturing sector, produced as a collaborative effort of the Puerto Rico Manufacturers Association, Scotiabank, and the Puerto Rico Institute of Statistics.

V. REFERENCES

- Abel, Jaison R., and Richard Deitz. 2012. "Do Colleges and Universities Increase Their Region's Human Capital?" *Journal of Economic Geography* 12, no. 3 (May): 667-91.
- . 2011. "The Role of Colleges and Universities in Building Local Human Capital." *Current Issues in Economics and Finance* 17, no. 6 (October). Available at http://www.newyorkfed.org/research/current_issues/ci17-6.pdf.
- Abel, Jaison R., and Todd M. Gabe. 2011. "Human Capital and Economic Activity in Urban America." *Regional Studies* 45, no. 8 (September): 1079-90.
- Alm, James. 2006. "Assessing Puerto Rico's Fiscal Policies." In Susan M. Collins, Barry P. Bosworth, and Miguel A. Soto-Class, eds., *The Economy of Puerto Rico: Restoring Growth*. Washington, D.C.: Brookings Institution and Center for the New Economy.
- Bosworth, Barry P., and Susan M. Collins. 2006. "Economic Growth." In Susan M. Collins, Barry P. Bosworth, and Miguel A. Soto-Class, eds., *The Economy of Puerto Rico: Restoring Growth*. Washington, D.C.: Brookings Institution and Center for the New Economy.
- Bram, Jason, Francisco E. Martinez, and Charles Steindel. 2008. "Trends and Developments in the Economy of Puerto Rico." *Current Issues in Economics and Finance* 14, no. 2 (March). Available at http://www.newyorkfed.org/research/current_issues/ci14-2.pdf.
- Burtless, Gary, and Orlando Sotomayor. 2006. "Labor Supply and Public Transfers." In Susan M. Collins, Barry P. Bosworth, and Miguel A. Soto-Class, eds., *The Economy of Puerto Rico: Restoring Growth*. Washington, D.C.: Brookings Institution and Center for the New Economy.
- Carlino, Gerald A., Satyajit Chatterjee, and Robert M. Hunt. 2007. "Urban Density and the Rate of Invention." *Journal of Urban Economics* 61, no. 3 (May): 389-419.
- Castillo-Freeman, Alida, and Richard B. Freeman. 1992. "When the Minimum Wage Really Bites: The Effect of the U.S.-Level Minimum on Puerto Rico." In George Borjas and Richard B. Freeman, eds., *Immigration and the Work Force*. Chicago: University of Chicago Press.
- Center for the New Economy. 2011. Unpublished Internal Analysis.
- Davis, Steven J., and Luis A. Rivera-Batiz. 2006. "The Climate for Business Development and Employment Growth." In Susan M. Collins, Barry P. Bosworth, and Miguel A. Soto-Class, eds., *The Economy of Puerto Rico: Restoring Growth*. Washington, D.C.: Brookings Institution and Center for the New Economy.

- Enchautegui, Maria E., and Richard B. Freeman. 2006. "Why Don't More Puerto Rican Men Work? The Rich Uncle Sam Hypothesis." In Susan M. Collins, Barry P. Bosworth, and Miguel A. Soto-Class, eds., *The Economy of Puerto Rico: Restoring Growth*. Washington, D.C.: Brookings Institution and Center for the New Economy.
- Glaeser, Edward L., Jose A. Scheinkman, and Andrei Shleifer. 1995. "Economic Growth in a Cross-Section of Cities." *Journal of Monetary Economics* 36, no. 1 (August): 117-43.
- Government Accountability Office. 2006. "Puerto Rico: Fiscal Relations with the Federal Government and Economic Trends during the Phaseout of the Possessions Tax Credit." Report GAO-06-541 (May). Available at <http://www.gao.gov/new.items/d06541.pdf>.
- Helpman, Elhanan. 2004. *The Mystery of Economic Growth*. Cambridge, Mass.: Harvard University Press.
- Klapper, Leora, Anat Lewin, and Juan Manuel Quesada Delgado. 2009. "The Impact of the Business Environment on the Business Creation Process." Policy Research Working Paper no. 4937. Washington, D.C.: World Bank Group.
- Krueger, Alan B. 1995. "The Effect of the Minimum Wage When It Really Bites: A Reexamination of the Evidence from Puerto Rico." In Solomon Polachek, ed., *Research in Labor Economics*. Greenwich, Conn.: JAI Press.
- Ladd, Helen F., and Francisco L. Rivera-Batiz. 2006. "Education and Economic Development." In Susan M. Collins, Barry P. Bosworth, and Miguel A. Soto-Class, eds., *The Economy of Puerto Rico: Restoring Growth*. Washington, D.C.: Brookings Institution and Center for the New Economy.
- Moretti, Enrico. 2004. "Estimating the Social Return to Higher Education: Evidence from Longitudinal and Repeated Cross-Sectional Data." *Journal of Econometrics* 121, no. 1-2 (July-August): 175-212.
- National Research Council of the National Academies. 2002. *Government-Industry Partnerships for the Development of New Technologies*. Edited by Charles W. Wessner. Washington, D.C.: National Academies Press. Available at <http://www.nap.edu/catalog/10584.html>.
- Pelzman, Joseph. 2002. "Imported Capital Dependency as an Economic Development Strategy: The Failure of Distortionary Tax Policies in Puerto Rico." George Washington University Working Paper Series_D0301. Available at http://works.bepress.com/joseph_pelzman/2/.
- Porter, Michael E. 1990. *The Competitive Advantage of Nations*. New York: Free Press.

REPORT ON THE COMPETITIVENESS *of* PUERTO RICO'S ECONOMY

- . 2004. "Building the Microeconomic Foundations of Prosperity: Findings from the Business Competitiveness Index." In M.E. Porter, K. Schwab, X. Sala-i-Martin, and A. Lopez-Claros, eds., *The Global Competitiveness Report 2004-2005*. New York: World Economic Forum.
- Report by the President's Task Force on Puerto Rico's Status. March 2011. Available at http://www.whitehouse.gov/sites/default/files/uploads/Puerto_Rico_Task_Force_Report.pdf.
- Rodrik, Dani, Arvind Subramanian, and Francisco Trebbi. 2004. "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development." *Journal of Economic Growth* 9, no. 2 (June): 131-65.
- State Science and Technology Institute. 2006. *A Resource Guide for Technology-based Economic Development*. Available at <http://www.ssti.org/>.
- U.S. Census Bureau. 2007. *Economic Census of Island Area*. Available at http://www.census.gov/newsroom/releases/archives/economic_census/2007_econ_census.html
- World Bank. 2003. *Doing Business in 2004: Understanding Regulation*. Washington, D.C.: World Bank.
- . 2005. *A Better Investment Climate for Everyone*. Washington, D.C.: World Bank.
- . 2011. *Doing Business 2011: Making a Difference for Entrepreneurs*. Washington, D.C.: World Bank.
- . 2012. *Employing Workers*. Washington, D.C.: World Bank.





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