**A Puerto Rican Failure: The Weak Infrastructure for Economic Growth**

While the Puerto Rican economy has been in severe recession since 2006, the island has also suffered from slow economic growth since the mid-1970s. Moreover, even if Puerto Rico emerges from the recession, it will surely experience continued relative stagnation—falling further and further behind the states—because of the continuing neglect of social and physical infrastructure. Public education, high-tech development, roads, and power generation are in poor shape. In the recession, annual fixed investment in “roads, schools, and other public works” fell sharply—by more than 50% in real terms between 2003 (the peak year) and 2010.[[1]](#endnote-1) Only a dramatic change in economic policy—virtually impossible under the current territorial arrangements—can alter this situation.

**Education**

Puerto Rico is sometimes viewed as having a highly educated labor force, largely because 22% of the population 25 or older has a bachelor’s degree or more (as compared to 28% for the states and a dozen states with a lower rate than Puerto Rico).[[2]](#endnote-2)

* Yet 32% of the population 25 or older is without a high school degree (as compared to 14% for the states, with only one state above 20%, Mississippi at 21%).[[3]](#endnote-3)
* Furthermore, measures of the quantity of educational attainment in Puerto Rico are misleading because, as is widely believed, the quality of the public schools is very low. Perhaps the clearest indication of poor quality is the very high share of students who attend private schools, a share that has risen greatly over the past few decades. It seems that people have been voting with their feet (or their children’s feet); see Table 1.[[4]](#endnote-4)

**Table 1**

**Enrollment in K-12 Schools in Puerto Rico, 1980-2010**

 Total Enrollment In Public Schools

 (in thousands) (in thousands) (percentage of total)

1980 811.3 716.1 88.3

1985 795.6 692.9 87.1

1990 797.0 651.2 81.7

1995 767.3 621.4 81.0

2000 796.0 612.3 76.9

2005 750.7 575.6 76.7

2010 703.0 493.3 70.2

 Source: *Statistical Abstract of the United States 2012,* Table 1321

* Also, the dropout rate for Puerto Rican schools is quite high; depending on the measure, Puerto Rico is below all or virtually all of the states in its ability to engage and retain students.[[5]](#endnote-5)
* The limited test data available that compare Puerto Rican public school students with students in the states also indicate problems with quality of school outcomes on the island. Comparative data that do exist show Puerto Rican students performing well below their counterparts in the states; see Table 2.[[6]](#endnote-6)

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**Table 2**

**National Assessment of Educational Progress,**

**Mathematics,**

**Results for Puerto Rico and the United States: 2003, 2005, and 2007**

 Average Score for Puerto Rico Average Score for States

 4th Grade 8th Grade 4th Grade 8th Grade

2003 178 234 234 276

2005 183 218 237 278

2007 0.26 0.25 0.55 0.51

Note: Scores from year to year and between grade levels are not directly comparable. For 2003 and 2005, scores are reported as absolute numbers. For 2007, scores are reported as average score on questions, presented as a decimal.

Sources: For 2003 and 2005 <http://nces.ed.gov/nationsreportcard/pubs/studies/2007459.asp>. For 2007 <http://nces.ed.gov/nationsreportcard/pubs/studies/2009451.asp>.

**High-Tech Development**

 In spite of the fact that Puerto Rican governments have touted the island as well prepared for high-tech activity—for the emergence of the “new economy”—the available data indicate otherwise. The National Science Board’s report *Science and Engineering Indicators 2010* (SEI) provides data which allow one to appraise the situation.[[7]](#endnote-7) For example:

* In 2007, federal research and development obligations per civilian worker for Puerto Rico were less than 10% of those for the states, $69 for Puerto Rico, but $764 states.
* Federal funding for small business innovation research for Puerto Rico in the 2003-2005 period per $1 million of GDP was $6 as compared to $161 for the states. These figures mean that Puerto Rico was getting less than 2% per person of what the states were receiving.
* In terms of state (or Puerto Rican) agency research and development expenditures per civilian worker, the 2007 figure for Puerto Rico was $1.87 while that for the states was $8.42.
* In 2005 in Puerto Rico, science and technology graduate students per 1,000 individuals 25 to 34 years old was 6.6, whereas in the states the figure was 11.7. (Four states did have a lower figure, but see the next point.) Moreover, between 2005 and 2007, the total number of these graduate students in Puerto Rico declined by 10%.
* In 2008, individuals in science and engineering occupations in Puerto Rico as a share of the work force were 1.68% as compared to 3.75% for the states (and no state had a lower figure than Puerto Rico).
* In 2008, there were 577 academic articles per 1,000 science and engineering doctorate holders in academia, whereas in the states there were 2,009.[[8]](#endnote-8)
* In 2006 in Puerto Rico, 1 patent was awarded per 1,000 individuals in science and engineering occupations, while the figure was 16.6 for the states. Puerto Rico compares similarly in terms of academic patents per 1,000 science and technology doctorate holders in academia—in 2006, 1.6 for Puerto Rico and 11.6 for the states.

In these data, Puerto Rico is compared to all the states taken together, most of which are, of course, not high-tech centers. Were the comparison confined to Silicon Valley, Seattle, Boston, and the Golden Triangle in North Carolina, for example, Puerto Rico would not appear to be even a player in the game.[[9]](#endnote-9) Moreover, it is clear from these data that the governments in both Washington and San Juan have not been providing the support that would make development along these lines a real possibility. The groundwork has not been laid.[[10]](#endnote-10)

**Physical Foundations**

There are positive aspects of Puerto Rico’s physical infrastructure. The island has extensive paved roads, various airports, and substantial seaports. However, overall there are serious problems with the island’s infrastructure:

* In the much cited 2006 volume on the Puerto Rican economy published by the Center for the New Economy and the Brookings Institute, two of the editors, Barry Bosworth and Susan Collins, conclude their discussion of infrastructure with the comment: “…available indicators suggest a physical infrastructure that is falling behind, particularly in dimensions such as information and communications, and that could constrain Puerto Rico’s prospects for increased growth.”[[11]](#endnote-11) Focusing on transportation, energy, and telecommunications, Bosworth and Collins cite several particulars:
* In spite of the extensive road network on the island, the extent of traffic congestion and the roughness of roads compare poorly with the states.
* Although overall use of energy is relatively high, the energy system is inefficient and energy prices are very high (about which more shortly).
* Phone coverage, both land lines and wireless, is low and has fallen behind as much of the rest of the world has moved rapidly ahead in recent decades.
* The data on which Bosworth and Collins make their appraisal is a few years old. However, there is good reason to believe the situation has deteriorated further in the ensuing years, especially the years of severe recession, as indicated by the large decline (noted above) of investment in “roads, schools, and other public works.”
* The problems with energy are especially important, significantly raising the costs of many businesses and thus a deterrent to new operations. Electrical energy in Puerto Rico is under monopoly control of the state enterprise Puerto Rico Electric Power Authority (PREPA). In the latter half of 2011, the price of electricity per kilowatt hour averaged 27.1 cents for residential customers, 28.6 cents for commercial customers, and 24.1 cents for industrial customers.[[12]](#endnote-12) Compared to the states overall, these prices are about 2.4 times as high for residential customers, 2.75 times as high for commercial customers, and 3.6 times as high for industrial customers.[[13]](#endnote-13)
* Part of the high cost of electricity in Puerto Rico is due to the heavy reliance on oil-fired plants. In the first decade of the 21st century, PREPA’s reliance on oil has been reduced from 80% to 65%, but the change has been accounted for more by coal than natural gas, as reliance on the former rose from 8% to 15% while reliance on the latter rose from 10% to 15%.[[14]](#endnote-14) Also, the decline in oil-reliance is not explained so much by new non-oil capacity as by the decline in total demand (a consequence of the recession) allowing some of the high-cost oil capacity to be used less extensively.
* PREPA’s problems run deeper than reliance on high-cost fuel. Eighty-four percent of PREPA’s generating capacity was constructed prior to 1977, and the average age of its generating facilities (weighted by capacity) is over 30 years.[[15]](#endnote-15)

**Infrastructure and Status**

 The effective development of the social and physical infrastructure depends on decision-makers in government and business having a long-run view of the economy. Yet, the territorial status of Puerto Rico generates uncertainty that undermines long-run approaches to economic activity. A short-run outlook, the continual search for a “quick fix,” has become an endemic characteristic of policy making on the island. Governments have continually implemented tax breaks for business and looked to Washington for special provisions that would encourage investment. Yet none of these actions have overcome the uncertainty of territorial status.

 The thinking of policy makers is stuck in the past and has been characterized by efforts to recreate the “economic glory days” of the immediate post-World War II decades. Thus the emphasis remains on attracting foreign investment in manufacturing, even when Puerto Rico has no special advantage in such activity—as wages have risen dramatically in relation to wages in many parts of the world and as Puerto Rico’s access to the U.S. market is virtually no different than most other parts of the world in this era of globalization.

 The focus on foreign investment has undermined the emergence of a strong business class, an entrepreneurial class, focused on the Puerto Rican economy, people who would push for policies that would enhance long-run economic prospects on the island—policies that would generate infrastructure. Moreover, lacking an interest in the long-run, and thus lacking an interest in an effective state apparatus, business officials and their allies in government have resisted efforts to improve the tax system. Severe tax evasion deprives the government of the funds it would need to create an effective infrastructure.

 There is little prospect of Puerto Rico building the foundations for economic growth within the framework of its current territorial status.

1. #  Even after some recovery, the figure for 2012, adjusted for inflation, was still 26% below the 2003 peak. The figures are computed from Table 4 and 8 of the *Statistical Appendix of the Economic Report for the Governor and Legislative Assembly,* <http://www.gdb-pur.com/economy/statistical-appendix.html>.

 [↑](#endnote-ref-1)
2. The figures are averages for 2006-2008 and are from the U.S. Census Bureau. The Puerto Rican figure is available at

<http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_3YR_DP02PR&prodType=table> and the figure for the states is available at

<http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_1YR_DP02&prodType=table>. For the individual states, the data are from the National Center for Educational Statistics <http://nces.ed.gov/programs/digest/d10/tables/dt10_012.asp>. West Virginia is as the bottom of the list at 16.9%. It should also be noted that, according to UNESCO data, no country in Latin America has as high a figure as Puerto Rico’s for share of the population with a bachelor’s degree or higher <http://stats.uis.unesco.org/unesco/ReportFolders/ReportFolders.aspx>. [↑](#endnote-ref-2)
3. See the previous note for sources. Of course, part of the explanation of the low level of high school completion in Puerto Rico is that schooling has expanded more recently than in the states, and thus it is largely among the elderly that the rate of high school completion is low. Nonetheless, these data need to be considered as part of the whole story of the labor force’s level of education. See the previous footnote for sources of the data. [↑](#endnote-ref-3)
4. There are problems with these data. In some years (not shown in the table) the data show large swings in private school enrollment that are not plausible. However, the large decline in public school enrollment is probably relatively reliable, even if the percentage figures in the final column of Table 4 are not fully accurate—i.e., even if the number of students in private schools is overstated. [↑](#endnote-ref-4)
5. See Neil Allison and Arthur MacEwan, “Students Dropping Out of Puerto Rico Public Schools: Measuring the Problem and Examining the Implications,” *Ensayos y Monografías*, Número 125, marzo 2005, Unidad de Investigaciones Económicas, Departamento de Economía, Universidad de Puerto Rico, Recinto de Río Piedras, <http://economia.uprrp.edu/ensayo%20125.pdf>. It would of course be inappropriate to simply blame the schools for this situation, as socio-economic factors play an important role affecting the dropout rate. [↑](#endnote-ref-5)
6. The National Assessment of Educational Progress (NAEP) is not used in Puerto Rico (partly because the reading segment of the test is in English), but there have been some trials of the NAEP tests in Puerto Rico using the mathematics portion of the NAEP (translated into Spanish). It is the data from these math tests that are presented in Table 2. Whether the test data indicate poor quality of the schools or poor quality of other factors—economic and social conditions are important determinants of test scores—they do suggest that the educational quality of the work force is not as high as years of schooling and degrees might suggest. Also, there are surely some good public schools in Puerto Rico, and many people on the island are well-educated and highly skilled. Yet the points and data set out here clearly show the general weakness of the Puerto Rican educational system. [↑](#endnote-ref-6)
7. National Science Board. 2010. *Science and Engineering Indicators 2010*. Arlington, VA: National Science Foundation (NSB 10-01). The data reported here are from this report and from the similar reports of earlier years. The SEI data for Puerto Rico are, however, hampered by the usual problems. The report states (p. 8-6): “Although data for Puerto Rico are reported whenever available, they frequently were collected by a different source, making it unclear whether the methodology used for data collection and analysis is comparable with that used for the states.” Nonetheless, the data in the report are sufficient to begin to obtain a useful picture of the situation in Puerto Rico. [↑](#endnote-ref-7)
8. While the number of articles is for 2008, the number of doctorate holders is for 2006. [↑](#endnote-ref-8)
9. The failure to develop the bases for “new economy” operations on the island has far reaching impacts. Not only are “high tech” companies missing, but all those other firms that are attracted by a “high tech” agglomeration are absent as well. Also, those individual Puerto Ricans who have the capacities to advance a “new economy” tend to leave the island. This “brain drain” is suggested by existing data, as discussed in Box 3. And there are numerous anecdotes of highly educated and technically capable Puerto Ricans leaving the island for positions in mainland private firms and government agencies (e.g,, NASA) where they are able to apply their skills.

 [↑](#endnote-ref-9)
10. Also, see the appraisal of Bosworth and Collins, as cited below. [↑](#endnote-ref-10)
11. Barry P. Bosworth and Susan M. Collins, “Economic Growth,” in Susan Collins, Barry P. Bosworth, and Miguel A. Soto-Class, editors, *The Economy of Puerto Rico: Restoring Growth, Center for the New Economy*, San Juan, and Brookings Institution, Washington. [↑](#endnote-ref-11)
12. Data from PREPA, <http://www.prepa.com/spanish.asp?url=http://www.aeepr.com/AVISOS.ASP>. [↑](#endnote-ref-12)
13. The prices for the states are averages of the prices for February 2011 and February 2012 from U.S. Energy Information Administration, Electric Power Monthly, April 2012, <http://www.eia.gov/electricity/monthly/pdf/epm.pdf>. Hawaii has somewhat higher prices than does Puerto Rico in all categories, but no other state comes even close to the Puerto Rican prices. [↑](#endnote-ref-13)
14. #  Current figures are from PREPA, <http://www.prepa.com/AEEES2_ENG.ASP>. Earlier figures are from a report by Richard D. Tabors and Ram Sekar, *Electric Power in Puerto Rico: An overview and policy analysis*, Tabors Caramanis & Associates, November 2004

 [↑](#endnote-ref-14)
15. Data from PREPA, <http://www.prepa.com/AEEES2_ENG.ASP>. [↑](#endnote-ref-15)