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ECONOMIC MACRODATA OF PUERTO RICO

INTRODUCTION

The purpose of this document is to provide information on the current situation of the System of National Accounts (SNA) of Puerto Rico, currently produced by the Puerto Rico Planning Board (PRPB). The present economic, fiscal, and political context is understood to place serious limitations on major changes in the SNA at this moment, as government priorities are directed at economic reconstruction from hurricane María, the earthquakes, and COVID-19. Nonetheless, some actionable initiatives are recommended that could improve Puerto Rico's SNA and make it more relevant for decision-making, in the government and the private sector. Operational issues that can be improved while leaving the SNA as is are differentiated from others that add components to the SNA.

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THE SYSTEM OF NATIONAL ACCOUNTS

The most important set of economic data available in Puerto Rico is that contained in its system of economic accounts, similar (with important differences) to that of national accounts. It is a system consisting of five main accounts that describe the transactions of businesses, individuals (including households), government, the rest of the world, and provides the estimates of GNP and its components.

BACKGROUND

The development of Puerto Rico's economic accounts responded to the needs in the mid 1940's of economic planning for information on the structure of the Island's economy. At the time, the availability of reliable, detailed, and accurate economic information, needed for the purpose of economic planning, then in its initial phases, and the development of economic policies was non-existent. The Puerto Rico Planning Board was created in 1942 and given the responsibility of developing the economic policy and direction of the Island's economic development, although limited resources were an obstacle.

The first initiative was the estimation of national income and product, and balance of payments in the mid-40's. At the time, at the Center for Social Research of the University of Puerto there were several researchers from the US, Harvey Perloff, Daniel Creamer and Robert Sammons, working on estimates of net income, gross national product, and balance of payments for Puerto Rico.[1] They were commissioned by the P.R. Planning Board to develop such estimates, with the assistance of technicians from the Board and UPR. At the beginning the estimates were for the period 1940-44. The results were subsequently published in 1946, 1948 and 1949.[2] Using their research and their estimates, the P.R. Planning

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[1] Junta de Planificación de Puerto Rico (1975). *Las Cuentas Sociales de Puerto Rico* (October 1975), pp. 4 – 5. At: https://estadisticas.pr/files/inventario/documentos-metodologicos/Cuentas%20Sociales%20en%20Puerto%20Rico.pdf.

[2] Robert L. Sammons and Belén H. Cestero (1946), Balance of external payments of Puerto Rico. Río Piedras, Editorial Universitaria, 1946; Daniel Creamer (1948), The Net Income of the Puerto Rican economy, 1940-1944. University of Puerto Rico, Social Science Research Center, 1948; Daniel Creamer and Henrietta Creamer, Gross Product of Puerto Rico 1940-

Board created the Division of Economic Planning. The Puerto Rico Planning Board (PRPB) was given the task of preparing an annual *Economic Report to the Governor*, which it still continues to do and is the basic source of macroeconomic data for Puerto Rico.

In 1950, the task of developing the estimates of net income, gross product and balance of payments were transferred to the then-existing Economic Development Administration (Fomento Económico) from the Bureau of the Budget. The estimates of income and product and balance of payments were extended from 1947 to 1952. In 1952, these functions were transferred to the PRPB to complement the preparation of the annual *Economic Report to the Governor*. Experts from the US Bureau of Economic Analysis, the United Nations, and the IMF were brought in to revise the methodologies and the estimates.[3] In 1955, the results were published in two reports; Net Income and Gross Product Puerto Rico, 1940, 1947-1955, and Balance of Payments Puerto Rico, 1947-1954.[4]

In 1967, based on 1960 estimates of input-output for Puerto Rico, the first input-output table for Puerto Rico was developed at the Planning Board, with 1963 as the base year, applying the Norwegian model adapted to Puerto Rico.[5] Later, the model was changed, adopting a recommendation from Wassily Leontief that it should include the same industrial sectors as those in the I-O table of the US, and the I-O matrix became another task for the PRPB.

THE SYSTEM

Different from other US jurisdictions, Puerto Rico was the first to develop and implement the system in 1950, providing a comprehensive and detailed level of

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1944, University of Puerto Rico, Social Science Research Center, 1948; Harvey S. Perloff (1947). Puerto Rico's Economic Future. University of Chicago Press, 1949.

[3] Junta de Planificación de Puerto Rico (1975), pp. 8-9.

[4] Junta de Planificación de Puerto Rico (1975), p. 11.

[5] The first I-O exercise for Puerto Rico was developed in 1955 by Amor Gosfield, *Input-Output Analysis of the Puerto Rican Economy*, in National Bureau of Economic Research, **Input-Output Analysis: An Appraisal, 1955**, pp. 321-367. At: http://www.nber.org/chapters/c2871.pdf

economic data not available even today in other states and territories. This, of course, provides a major advantage for planning and decision-making purposes.

The system estimates key macroeconomic aggregates such as gross national product (which is the main macroeconomic aggregate used in Puerto Rico), consumption (individuals and government), gross domestic investment (Private and public), personal income, and exports and imports (Balance of Payments). They are based on a system of debits and credits.[6] The current system is based on the SNA of the United Nations of 1968. The estimates are provided on a fiscal year basis (in the case of Puerto Rico from July through June the following year). Table 1 below presents a summary of the estimates of nominal GNP.

Besides methodological differences, there are four key differences between the estimates for states and territories of economic accounts using the US BEA (GDP by State), and those of Puerto Rico.

The first is that they use GDP, versus GNP; secondly, their estimates are on a quarterly (and annual) basis, whereas PR's are only on a fiscal year basis; third; the Federal government is considered as a "foreign" entity in the transactions of Puerto Rico (see Table 2), and fourth; the series available from Puerto Rico's economic accounting are much more comprehensive than those of the states' GDP estimates, as the latter estimates consist of a breakdown by industry sector, personal consumption expenditures, and personal income, but not of GDP components.[7] Puerto Rico also provides estimates of nominal GDP by industrial sectors (NAICS-based) and, as in the states and territories, a breakdown of personal consumption expenditures by type of goods and services.[8]

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[6] For a full description and estimates see the annual publication *Income and Product 2018*, Puerto Rico Planning Board (May 2019), pp. 57 – 72. At: http://jp.pr.gov/Econom%C3%ADa/Ingreso-y-Producto#.

[7] See U.S. Bureau of Economic Analysis, *GDP by State*. At: https://www.bea.gov/data/gdp/gdp-state. Another important difference is that the U.S. BEA also estimate a GDP for regions, something not available in Puerto Rico.

[8] See tables 5 and 10 of *Income and Product 2018*.

Table 1

GROSS NATIONAL PRODUCT: FISCAL YEARS
(In millions of dollars)

	2010	2011	2012	2013	2014	2015	2016	2017r	2018r	2019p
GROSS PRODUCT	**64,294.6**	**65,720.7**	**68,085.7**	**68,944.9**	**68,797.5**	**69,602.0**	**69,985.2**	**69,049.5**	**67,824.7**	**70,780.5**
Personal consumption expenditures	**56,783.8**	**58,154.8**	**60,697.0**	**62,477.6**	**61,699.4**	**61,640.5**	**60,979.4**	**62,453.8**	**64,848.8**	**68,656.6**
Durable goods	5,368.5	5,677.3	6,107.3	6,495.9	5,835.0	5,658.8	5,774.9	5,970.3	6,455.6	7,397.4
Nondurable goods	22,924.6	23,655.6	24,793.9	25,477.0	24,648.7	24,663.2	23,776.7	24,639.3	26,557.8	27,683.4
Services	28,490.7	28,821.9	29,995.8	30,504.7	31,415.6	31,318.4	31,427.9	31,844.1	31,835.3	33,575.8
Government consumption expenditures	**10,641.9**	**10,506.6**	**10,794.6**	**10,589.4**	**11,032.6**	**9,100.3**	**8,603.7**	**9,057.5**	**8,052.8**	**9,174.7**
Central government (1)	8,129.8	7,799.2	7,963.1	7,769.7	8,216.5	6,348.1	5,794.6	6,258.9	5,504.6	6,697.3
Municipalities	2,712.1	2,707.4	2,831.5	2,819.7	2,816.1	2,752.1	2,809.1	2,798.6	2,548.2	2,477.5
Gross domestic investment, total	**9,012.1**	**10,105.1**	**10,496.2**	**9,743.0**	**9,159.9**	**8,888.8**	**8,425.5**	**8,062.7**	**15,868.0**	**15,299.0**
Change in inventories	93.6	500.0	140.2	90.2	128.6	84.5	121.2	(193.5)	(18.3)	(15.9)
Gross fixed domestic investment	8,918.5	9,605.1	10,356.1	9,672.7	9,031.3	8,804.3	8,304.3	8,256.1	15,886.3	15,314.9
Construction	**3,668.5**	**3,860.3**	**4,558.5**	**3,976.1**	**3,405.4**	**3,298.7**	**2,726.3**	**2,423.0**	**8,716.3**	**7,531.3**
Private enterprises	1,830.6	1,801.7	2,056.3	1,920.9	1,849.8	1,854.8	1,788.2	1,634.6	3,082.7	3,541.9
Public enterprises	1,204.2	1,170.4	1,464.8	1,274.2	940.1	858.4	502.1	412.7	5,365.2	3,636.8
Government	633.7	888.2	1,037.4	782.8	615.4	585.5	436.0	375.8	270.5	352.5
Central government (1)	353.0	562.6	707.2	499.2	381.6	345.0	297.7	270.0	203.1	286.3
Municipalities	280.7	325.6	330.2	283.6	233.8	240.5	138.2	105.7	67.4	66.3
Machinery and equipment	5,250.0	5,744.8	5,797.5	5,694.7	5,625.9	5,505.6	5,578.0	5,833.1	7,168.0	7,783.6
Private enterprises	5,058.2	5,458.7	5,528.9	5,482.3	5,435.8	5,282.9	5,365.3	5,612.7	6,987.3	7,580.0
Public enterprises	79.4	90.8	84.2	55.1	46.6	49.8	41.9	48.9	45.5	40.5
Government	112.5	195.4	184.5	157.2	143.5	172.9	170.7	171.6	135.2	163.0
Central government (1)	64.1	146.4	133.5	107.1	94.3	124.6	123.1	124.5	92.9	122.5
Municipalities	48.4	49.0	51.0	50.1	49.2	48.3	47.6	47.1	42.2	40.6
Net sales to the rest of the world	**(12,343.3)**	**(13,045.8)**	**(14,102.1)**	**(13,885.0)**	**(13,294.4)**	**(10,027.6)**	**(6,023.5)**	**(10,524.4)**	**(20,944.9)**	**(22,349.8)**
Sales to the rest of the world	74,310.3	76,575.8	74,754.8	74,752.6	74,544.0	77,873.9	80,811.7	80,326.5	72,691.1	74,400.4
Federal government	1,825.8	1,765.3	1,961.6	1,963.1	1,887.8	1,972.5	2,006.1	2,101.7	2,223.8	1,908.7
Other nonresidents	72,484.5	74,810.5	72,793.2	72,789.5	72,656.2	75,901.4	78,805.7	78,224.8	70,467.3	72,491.7
Purchases from the rest of the world	86,653.6	89,621.5	88,856.9	88,637.6	87,838.4	87,901.5	86,835.2	90,850.9	93,636.0	96,750.2
Federal government	345.0	357.3	267.1	265.7	258.5	267.9	241.7	263.7	271.2	292.9
Other nonresidents	86,308.6	89,264.2	88,589.8	88,371.8	87,579.8	87,633.6	88,593.5	90,587.2	93,364.8	96,457.3

Source: P.R. Planning Board (2020). *Statistical Appendix 2019* (April 2020). Table 1. r- Revised figures. p- Preliminary figures. ( ) Negative figures.
(1) Includes agencies, the University of Puerto Rico, the State Insurance Fund Corporation, and the Highway and Transportation Authority.

Table 2

RECONCILIATION: GROSS NATIONAL PRODUCT AND GROSS DOMESTIC PRODUCT BY MAJOR INDUSTRIAL SECTOR: FISCAL YEARS
(In millions of dollars)

	2010	2011	2012	2013	2014	2015	2016	2017r	2018r	2019p
GROSS PRODUCT	**64,294.6**	**65,720.7**	**68,085.7**	**68,944.9**	**68,797.5**	**69,602.0**	**69,985.2**	**69,049.5**	**67,824.7**	**70,780.5**
Less: Rest of the world	(34,086.7)	(34,631.0)	(33,479.1)	(33,505.2)	(33,648.3)	(33,773.5)	(34,351.5)	(34,396.0)	(33,154.3)	(34,208.1)
Federal government	1,159.2	1,154.9	1,201.8	1,203.4	1,148.8	1,201.6	1,222.6	1,281.0	1,413.9	1,049.9
Other nonresidents	(35,245.9)	(35,785.9)	(34,680.9)	(34,708.5)	(34,797.1)	(34,975.1)	(35,574.1)	(35,677.0)	(34,568.1)	(35,258.0)
GROSS DOMESTIC PRODUCT	**98,381.3**	**100,351.7**	**101,564.8**	**102,450.0**	**102,445.8**	**103,375.5**	**104,336.7**	**103,445.5**	**100,978.9**	**104,988.6**
Agriculture	822.0	795.0	816.4	846.7	867.1	854.9	840.6	846.9	714.7	715.7
Mining	33.7	28.4	34.5	35.8	20.0	26.2	26.0	29.6	29.8	32.0
Utilities	1,981.9	1,867.5	2,074.3	1,638.1	2,128.8	2,104.6	1,936.2	2,168.9	2,009.9	2,399.0
Construction	1,484.4	1,303.9	1,335.0	1,216.1	1,130.2	1,007.3	863.9	795.5	1,055.3	1,094.9
Manufacturing	46,577.3	46,760.0	46,971.4	47,580.9	47,876.2	49,519.6	50,543.7	48,966.1	47,496.2	49,392.1
Wholesalers Trade	2,993.1	2,909.1	2,819.1	2,662.3	2,818.9	2,793.5	2,780.6	2,665.0	2,672.9	2,756.2
Retail Trade	4,472.8	4,787.2	4,808.5	4,963.3	5,030.4	4,908.2	5,073.8	5,452.0	5,455.6	5,576.3
Transportation and Warehousing	941.0	897.8	946.5	937.1	912.8	1,026.6	1,088.7	1,173.1	1,182.7	1,371.8
Information	2,646.0	2,610.2	2,464.7	2,330.7	2,645.4	2,699.0	2,959.4	1,984.8	1,918.4	1,964.8
Finance and Insurance	5,240.7	5,611.2	5,176.1	5,758.3	4,416.5	4,617.1	4,494.9	4,371.0	4,230.8	4,342.5
Real Estate and Rental	13,785.4	14,368.8	15,383.3	15,426.3	15,793.5	15,301.4	15,757.2	15,987.4	16,460.8	17,032.6
Professional, Scientific, and Technical Services	1,510.1	1,550.3	1,622.3	1,755.3	1,833.2	1,924.7	2,064.1	2,183.6	2,258.9	2,421.4
Management of Companies and Enterprises	72.5	79.1	73.1	65.9	67.5	82.5	95.0	94.7	112.0	118.5
Administrative Services and Support	1,600.4	1,681.7	1,764.8	1,824.8	1,820.4	1,786.6	1,737.5	1,818.5	1,984.6	1,948.9
Educational Services	721.3	683.9	704.5	658.0	701.2	644.8	628.7	586.0	557.3	569.9
Health Care and Social Services	3,293.9	3,394.0	3,379.8	3,606.2	3,720.4	3,828.4	3,835.8	3,893.9	3,735.7	3,866.5
Art, Entertainment and Recreation	93.8	85.9	91.2	105.4	147.9	134.8	144.7	152.1	139.0	158.3
Accommodation and Food Services	1,765.8	1,779.8	1,849.2	1,972.5	2,022.4	2,057.1	2,121.4	2,143.6	2,039.6	2,127.9
Other Services	389.5	383.2	395.4	423.9	432.8	423.3	426.2	429.2	404.6	429.7
Government	8,349.9	8,215.9	8,277.7	8,237.5	7,825.1	7,264.0	7,236.1	7,175.2	6,343.1	6,053.4
Central (1)	6,861.7	6,703.1	6,740.4	6,664.9	6,285.5	5,740.8	5,686.4	5,626.1	4,946.2	4,789.3
Municipalities	1,488.2	1,512.8	1,537.3	1,572.7	1,539.6	1,523.3	1,549.7	1,549.1	1,397.0	1,264.1
Statistical discrepancy	(294.4)	558.9	577.3	405.0	235.3	371.2	(317.7)	528.7	177.4	616.6

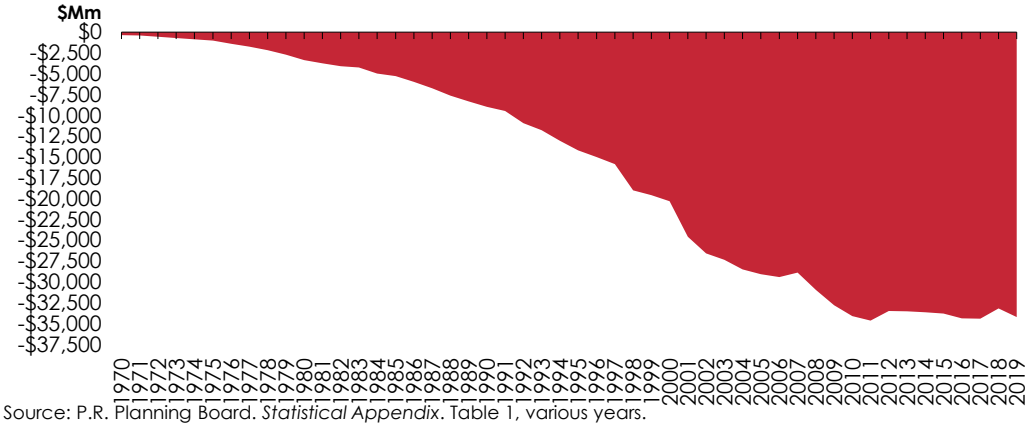
Source: P.R. Planning Board (2020). *Statistical Appendix 2019*. Table 9. r- Revised figures. p- Preliminary figures. ( ) Net outflow
(1) Includes agencies, the University of Puerto Rico, the State Insurance Fund Corporation, and the Highway and Transportation Authority.

Although the P.R. Planning Board estimates GDP for Puerto Rico (see table 2), the indicator mostly used is that of GNP, since it is the income that accrues to residents minus payments to factors of production in the rest of the world. The reason is the huge gap between both, a gap that has been increasing

significantly since the early 1970's as a result of the huge outflows of net income (profits) of the subsidiaries of U.S. companies in Puerto Rico, likely reflecting transfer pricing, and interest payments on Puerto Rico's externally held private and public debt. Figures 1 and 2 illustrates the situation.

Figure 1

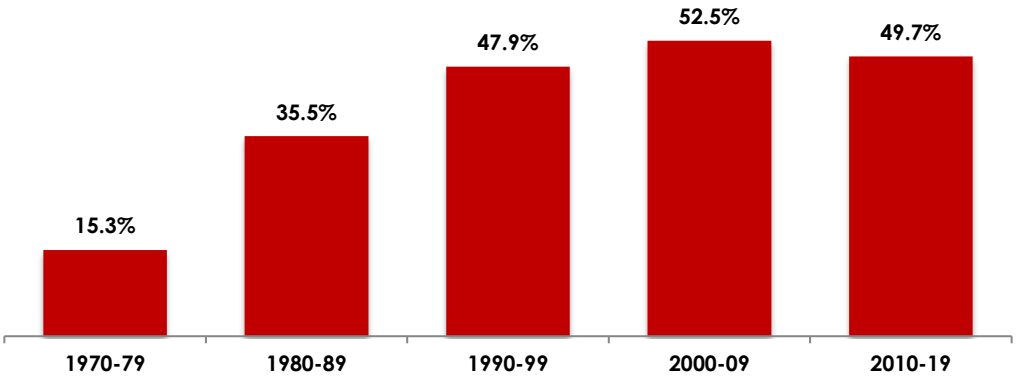
GNP/GDP Gap Puerto Rico



Source: P.R. Planning Board. *Statistical Appendix*. Table 1, various years.

Figure 2

GNP/GDP Gap as a percentage of GNP



Source: P.R. Planning Board. *Statistical Appendix*. Table 1, various years.

Between fiscal years 1970 and 2019, the gap as a percentage of nominal GNP increased from 15.3% to 53.0% in fiscal 2011, diminishing to 48.3% in fiscal 2019 as manufacturing activity decreased. The proportion, though, is still extremely high.[9]

[9] Ireland is another economy with a similar situation for the same reasons. See Brad W. Setser (2019), "Ireland's Statistical Cry for Help" Council on Foreign Relations (November 1, 2019). At: https://www.cfr.org/blog/irelands-statistical-cry-help.

PROPOSALS FOR IMPROVEMENTS

Over the last few decades, a number of proposals have been made for improvement in the economic accounts. Some have been implemented, others not. They have centered on four areas: (1) revision of methodologies; (2) change of the base year, which presently is set at 1954 prices; (3) develop estimates on a quarterly basis, and; (4) develop new price indexes to deflate the components of the rest of the world account (Purchases and Sales) and of the other components of GNP/GDP. This represents a serious problem when estimating the implicit price deflators for nominal GNP due to the importance that the trade balance in the rest of the world account has on P.R.'s GNP, in particular when deflated.[10]

Since 2000 there have been several proposals or initiative. The most comprehensive one is that of 2009.

In 2009, by initiative of the Government Development Bank and the PRPB a group of local experts were hired to evaluate the economic statistics generated by the Area of Economic and Social Planning of the PRPB. At that time, staff from the US BEA were brought in to evaluate P.R.'s SNA and make recommendations. These recommendations were presented on September 2011 and, together with those from the local experts, were used to prepare the *Plan for the Restructuring and Methodological Modernization of Puerto Rico's SNA*, adopted in 2016 by the PRPB, to be completed during 2016-2020.[11]

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[10] At constant prices, both exports and imports surpass actual GNP in value, which implies that percentage growth in these items contributes far more to growth than other components of GNP. For example, in fiscal year 2014, exports (goods and services) contributed with 2.0 pp. to real GNP growth, and imports (which subtract) 4.2 pp. A 1% reduction in exports would reduce GNP by 2 percentage points (pp), and a 1% reduction in imports would *increase* GNP by 4.2 pp. This results in that even relatively small changes in the trade balance exert a significant effect upon the GNP, counterbalancing the full effect of the current fiscal crisis. This is important, as Puerto Rico's exports normally respond to the production of pharmaceuticals by US corporations, and a sizable portion of the imports are raw materials used to make such exports. Foreign-made exports respond far more to global economic demand than to local economic situations, and thus the trade balance may continue to grow favorably in spite of the local economy conditions, such as the fiscal crisis at the time.

[11] Junta de Planificación de Puerto Rico. Resolución JP-PPES-2016-001. Para Adoptar el Plan de Restructuración y Modernización Metodológica del Sistema de Cuentas Nacionales de Puerto Rico (February 5, 2016). At: https://estadisticas.pr/files/BibliotecaVirtual/Resolucion_para_aprobar_RoadMap_por_parte_de_la_Junta_de_Planificacion.pdf.

In 2016, the experts from the US BEA returned to provide advice on the part of the plan related to the SNA and recommended that the United Nations SNA approach of 2008 be adopted. Work on the Plan continued in 2017 but was delayed subsequently.

In October of 2019, at the request of the government of Puerto Rico, and following their 2011 recommendations, the U.S. BEA released a prototype of statistics for personal consumption expenditures, private fixed investment, and net exports of goods for Puerto Rico for the calendar years 2012 through 2017.[12] These initial estimates were developed to make data on Puerto Rico comparable to that of other territories and the states. The key indicator will be GDP, not GNP. This first release follows previous reports, such as that of the General Accounting Office of 2018, that emphasized the need for an improvement of the economic statistics of Puerto Rico.[13]

Several key issues have not been dealt with; for instance, how far back will the estimates go, dealing with the gap between GDP and GNP, and the inclusion and coverage of public construction investment.

The continuing support of the US BEA can be counted on in any effort toward an improvement of the SNA (and the Input-Output Matrix). The issue is whether it will be an improvement of the existing system, or does it imply discarding it and instead, opt for what the US BEA is doing? In this sense, it is important to take note of the final observation made by the US BEA in its report: "*Because Puerto Rico is not included in most of the major surveys used by the BEA to estimate U.S. GDP, the support and assistance provided by the government of Puerto Rico will be critical to the successful production of these estimates.*"[14] In other words, the project and estimates would be contingent upon continuing financial support

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[12] U.S. Bureau of Economic Analysis. Economic Statistics for Puerto Rico (October 15, 2019). At: https://www.bea.gov/data/gdp/gdp-puerto-rico.

[13] General Accounting Office (2018). Puerto Rico – *Limited Federal Data Hinder Analysis of Economic Condition and DOL's 2016 Overtime Rule*. GAO-18-483 (June 2018). At: https://www.gao.gov/assets/700/692908.pdf.

[14] U.S. Bureau of Economic Analysis. *Prototype Economic Statistics for Puerto Rico, 2012-2017*. News Release (October 15, 2019), p. 4. At: https://www.bea.gov/system/files/2019-10/pr-econ-stats-10152019.pdf.

from the government, different from the states and other territories whose estimates are included in the US BEA budget. In the meantime, the recommendations they made in 2016 should continue to be implemented.

OTHER CONCERNS

The above description of the evolution of the SNA in Puerto Rico highlights a number of issues that have been discussed over the years with solutions that basically maintain the same structure of the accounts. Included are the following: the preparation of quarterly reports on GNP and other macro-economic variables, changing the 1954 base for estimating real GNP and, of course, providing additional resources to the PR Planning Board, among others.

There are other concerns that have to do with the relevance, completeness, and accuracy of the SNA. These are discussed below.

A REGIONAL SNA

Puerto Rico's SNA is based on that of the United States. In fact, some of those responsible for it were also involved with Simon Kuznets in developing the U.S. system of accounts. Puerto Rico's SNA mirrors that of the U.S., except for the fact that the Island never put together a flow of funds account that is part of the U.S. SNA. One major issue that needs to be addressed is the fact that a national economy differs substantially from a regional economy. The latter tend to be more open and thus more dependent on external markets. In a multi-region system, interregional flows assume great importance.

In Puerto Rico's case, the Island's economy behaves more like a regional than a national economy precisely because of the free flow of factors of production with the mainland economy. What this suggests is that Puerto Rico's SNA should be thought of differently from that of a national system. Compared to the states, Puerto Rico's SNA does have a major advantage in that it has a balance of payments account.

Major work on regional accounting systems has been done since the sixties by Charles Leven, Richard Easterlin, Harvey Perloff, Walter Isard and others. Isard's *Methods of Regional Analysis* (1960) was an important contributor on the issue. Interestingly, in the chapter on regional accounting, Isard utilized Puerto Rico's Balance of Payments numbers. Puerto Rico, a regional economy, was the only one with such an account. James Ingram's 1962 book on *Regional Payments Mechanisms* likewise uses Puerto Rico Balance of Payments numbers.

The differences between regional accounting systems and those for a national economy include:

a. The Rest of the World Account is of much greater importance for a region and thus deserves greater attention to detail and comprehensiveness.

b. At the national level, transactions that are completed within the nation exceed those not completed internally. In a region the number of transactions that are completed within the region is much less. Thus, retained earnings accounted for as part of regionally generated income when distributed, can be part of payments abroad. Ownership then becomes a component of the accounting system.

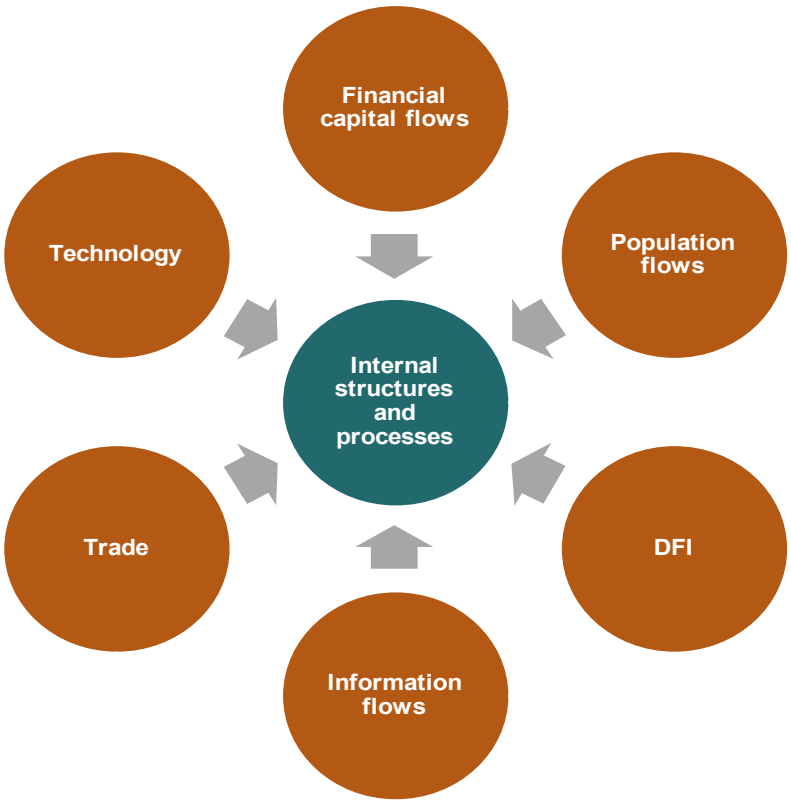
c. Given the fact that exports are key, accounts should differentiate between production for the local market and production for export (Isard, p. 108).

d. Sectors in a region will not necessarily be the same as for the nation or for other regions, thus a regional accounting system must highlight what the key sectors are. Given the size of a regional economy the importance of specific sectors is greater than in the national economy, since the latter is typically more diversified.

e. The public sector must be incorporated in greater detail in regional accounts because of its greater impact.

f. Regional accounts must be constructed in such a way as to permit estimating the impacts on the region of actions at the national level.

g. Since a characteristic of a regional economy is the free flow of factors of production, a regional accounting system must incorporate these flows. The Flow of Funds Account, described below, deals with the financial flows. Schematically, the openness of a regional economy is illustrated in the following graph:



THE FLOW OF FUNDS ACCOUNT

As indicated previously, Puerto Rico does not have a flow of funds account. It is an issue that has been discussed for many years. For a regional economy whose financial sector is closely bound to that of the U.S., and in which external financing is such an important component of its total investment, having a flow of funds account would seem to be a necessary addition to the SNA. Puerto Rico has the sources of information for many of its components through different

channels: The Office of the Commissioner of Financial Institutions, Hacienda, federal and local agencies that handle federal programs, the FDIC, the Federal Reserve and the Office of the Commissioner of Insurance.

The rationale for creating a Flow of Funds account is that it provides a more detailed picture of sources and uses of funds than presently available for specific sectors. Thus, it would present in a coherent and systematic manner financial information that may very well be available but in a fragmented manner. What the Flow of Funds account would provide in detail are the financial transactions between sectors and with the Rest of the World. The account can provide the wherewithal for decision-making related to financial policies related to promoting savings and investment.

One advantage, mentioned in the attached report, is that the account would permit linking the financial and the real production activities and the contribution of the former to the latter. It would make possible more precise information on the impact of financial variables (interest rates, for example) on real economic activities across all sectors. One very major advantage would be having a more precise information on how Rest of the World private financing impacts different sectors. How much of investment comes from own sources, from borrowing or from direct financial investment. This is, of course, valuable information in policymaking related to promotional strategies.

Constructing a Flow of Funds account will not require a major investment and can be done in a relatively short period.

THE INTANGIBLE ECONOMY

Intangible investments are considered to be crucial factors that determine the competitiveness of an economy. They are strongly linked to knowledge-based production and consist of interrelated activities: technological innovation, marketing, information technology and training and education. Estimating total intangible investments is hampered by differences of definitions, overlap between the categories of intangibles, and coverage of the data.

In a 2016 study for the DDEC, *The Intangible Services Economy* (ISE), a methodology was developed to better account for the intangible economy. In that study, ISE GDP represented $5,140 million, of which 37.3% is originated by the telecommunications sector (NAICS 517), followed by the General medical and surgical hospitals (NAICS 6221), with 31.6% and the management, scientific and technological consulting sector, with 7.6%. These three sectors combined represented 76.5% of ISEs GDP.

The businesses and companies in the ISE generate a significant amount in terms of sales and revenues, about $8,213 million in 2012. This amount represented 11.5% of the Island's GNP in that year. The telecommunications sector accounted for 29.0% of the total sales/revenues, while general medical and surgical hospitals generated 31.0%, and architectural, engineering, and related services 8.2%, with those in management, scientific, and technical consulting services generating 6.4%.

As of 2015-Q1, there were 2,523 firms in the ISE, the majority of which were in Medical and Diagnostic Laboratories (26.6%), followed by Management, Scientific and Technical Consulting Services (24.9%), Architectural, Engineering and Related Services (22.2%), and Computer Systems Design and Related Services (12.6%).

In 2013, the gross domestic expenditures on R&D (GERD) in Puerto Rico amounted to $450.0 million, according to the survey from the Institute of Statistics of P.R., or 0.3% of the GDP. Of this amount, that for services (ISE) represented 68.9%, or $310.4 million. The GERD-performing institutions include firms in the ISE, the government, non-profit organizations, and private and public higher-education institutions.

The above numbers are from the 2016 study and were estimated for the project. In effect, there have been no more recent estimates. Given the thrust towards a knowledge-based economy in which Advanced Services will be key and in

which R & D must play a leading role, having an accurate and continuing accounting of these activities is essential.

THE INFORMAL ECONOMY

There have been a number of studies on the informal economy of Puerto Rico that have resulted in a consensus that it is in the neighborhood of 25% of the formal economy. It includes a broad array of activities that include drugs, gambling, tax evasion, informal activities such as street vendors, barter, minor construction activities and others. Although the underground economy is partially accounted for in consumption figures, the income component is absent from the accounts. In any case, not all informally generated income is dedicated to reported consumption. Nevertheless, the very high ratio of consumption to income in Puerto Rico for a number of decades can be partly explained by the size of the informal economy.

Although COVID and, prior to that, the hurricanes and the earthquakes probably changed the nature and size of the informal economy it remains a major component of the economy and its existence has a direct impact on the fiscal health of the government. Efforts have been made to reduce it, but with little success. Access to federal aid will require certain changes such as having a social security number, formal title to properties and, in some cases, a bank account that will possibly improve reporting.

A number of approaches to measuring the informal economy have been used in Puerto Rico in the various studies that can very well be incorporated in a continuing initiative by the PR Planning Board and incorporated in the SNA as an appendix or a satellite account.

GOVERNMENT RESPONSE TO SECTION 205(A) RECOMMENDATIONS

On March 6, based on Section 205(a) of PROMESA, the FOMB made several recommendations to the Governor of Puerto Rico on P.R.'s SNA and other key indicators estimated by the PR Planning Board.

In its response of June 2nd, the government indicated that it will not adopt or implement the recommendations made, and initially adopted, by the PR Planning Board of 2011 and 2016 (described above). Instead, it will concentrate on implementing the recommendations made in the *Congressional Task Force Report on Economic Growth in Puerto Rico of 2016*, to include Puerto Rico in the statistical programs that are conducted by Federal agencies, including the U.S. BEA, which relates to the new estimates of GDP for Puerto Rico, introduced last year (as previously described).

Although the PRPB continues with its task of estimating the annual SNA, the response re-states the commitment of the government to the U.S. BEA project, which in its next stage will estimate the rest of the components of GDP. For 2018, these will be estimated on a quarterly basis, and eventually for GNP. It is also stated that the long-term goal is to have Puerto Rico included in all the surveys and data collection programs of the federal government on which U.S. BEA's estimates depend on (p. 2). Since Act 141 of 2008, which re-organized the Department of Economic Development and Commerce (DDEC), the PRPB is now under the aegis of the DDEC, with the consequent integration of the government's statistical programs. It is logical to assume that eventually the current detailed system of SNA and related accounts as estimated by the PRPB will suffer significant changes, in general reducing the detailed information now generated.[15] Indeed, this is clearly stated when the governor responds that "Investing in modernizing the Puerto Rico Planning Board's national accounting system would be duplicative" (P. 3). That should be a matter for serious consideration for the reasons described below.

As indicated previously, there are serious limitations under the new scheme of the U.S. BEA's project that will have permanent negative impact on P.R.'s availability of comprehensive macroeconomic data over time. Much valuable economic data would be lost:

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[15] As published in the annual publications *Statistical Appendix to the Governor*, *Balance of Payments*, and *Income and Product*.

1. Detailed accounts of personal consumer expenditures (See Table 1 above, and Table 5 of Income and Product);
2. The detailed information of the five accounts which comprise the SNA of Puerto Rico (Income and Product and National Accounts publication);
3. The level of detail currently available for gross fixed domestic investment, which distinguish between public and private investment in construction, and by public entities, something that is very useful for government economic policymaking;
4. No estimates of Balance of Payments, net returns (income) of non-resident companies, flows of federal funds and transfers, (The publication and Table 18 of the Statistical Appendix);
5. Consumer debt (Table 17 of the Statistical Appendix);
6. Financial assets of individuals (Table 16 of the Statistical Appendix);
7. Expenditures by federal agencies in Puerto Rico (Table 20 of the Statistical Appendix);
8. Transfers between P.R., the federal and state governments, and other nonresidents (Table 21 of the Statistical Appendix);
9. Federal grants to the government and municipalities (Table 23 of the Statistical Appendix);
10. The fact that so far, the starting year is 2012, which when fully adopted will preclude long-term economic growth forecasts for some time.
11. The update of Puerto Rico's Input-Output matrix, currently estimated by the P.R. Planning Board and available for the year 2007, will be eventually lost, as according to the government response "the U.S. BEA does not have plans to produce I-O Tables for Puerto Rico" (P.4).

RECOMMENDED ACTIONS

The present situation of the Island's government makes it very difficult to introduce major changes in the SNA since priorities are on other more urgent matters related to dealing with COVID, hurricane and earthquake recovery and making sure that CDBG-DR funds are invested quickly and properly. Thus, the recommendations below are of two types: those that are within the scope of PRPB responsibilities and can be implemented relatively quickly with limited needs for extra resources, and those that will require more effort and the collaboration of other entities.

We believe that the SNA of Puerto Rico, with the following recommended changes, should be maintained until a major overhaul is possible:

a. Revision of methodologies, possibly adding the segmentation of production for export and for local consumption;

b. Change of the base year, which presently is set at 1954 prices;

c. Develop estimates on a quarterly basis, and;

d. Develop new price indexes to deflate the components of the rest of the world account (Purchases and Sales) and of the other components of GNP/GDP.

e. Improve timeliness of data publications (Fiscal 2019 aggregate numbers took almost ten months to be made available).

f. Full implementation of the 2016 improvement plan of the PRPB, which includes technical support from the U.S. BEA.

g. Efforts should be started to prepare the two satellite accounts described below and a Flow of Funds Account.

The recommendations made here do not preclude counting on U.S. BEA's technical support. DDEC's inclusion in this effort is essential since the Department, under Act 141-2018, has direct responsibility for the SNA. It should be noted that,

in its response to the FOMB the government indicated that the priorities of the new Office of Economic Planning and Statistics created by that Act are "*aligned to support the ongoing needs of the collaboration with the BEA.*" (P. 3).

With respect to other changes that would involve agencies and private sector entities, the PRPB would be involved but not as lead. What is being recommended is the creation of satellite accounts for key sectors that are currently not handled adequately in the SNA. In creating these accounts, the PRPB would have a major role.

Satellite Accounts

Eurostat describes satellite accounts as follows:

"*Satellite accounts as providing a framework linked to the central (national or regional) accounts, allowing attention to be focused on a certain field or aspect of economic and social life in the context of national accounts; common examples are satellite accounts for the environment, or tourism, or unpaid household work.*

Satellite accounts are one way in which the SNA may be adapted to meet differing circumstances and needs and are particularly useful for a regional economy for reasons mentioned above. They are closely linked to the main system but are not bound to employ exactly the same concepts or restrict themselves to data expressed in monetary terms. Satellite accounts are intended for special purposes such as monitoring the community's economic health or the state of the environment. They may also be used to explore new methodologies and to work out new accounting procedures that, when fully developed and adopted, might become absorbed into the main system over time.

Satellite accounts can meet specific data needs by providing more detail, by rearranging concepts from the central framework or by providing supplementary information. They can range from simple tables to an extended set of accounts in special areas like for e.g. environment or education".

What is being recommended is the initial creation of two satellite accounts for the following:

The Advanced Services sector. As indicated above, activities related to telecommunications, IT, R&D, engineering and design and other advanced services are not adequately dealt with in the SNA. The possibility that undercounting these services may introduce a downward bias in growth estimates is a possibility. The SNA deals with the tangible economy adequately,

but this is the segment of the economy that is not growing and, in fact, may very well be contracting, not only in PR, but globally, with intangibles becoming more important. As mentioned above, with PR moving towards a knowledge economy, having better information on these activities in a continuing basis is key. The Science, Technology and Research Trust would have a key role, together with other entities such as the IT Cluster, the Engineers Association, and others.

Tourism. Although tourism accounts for a relatively small share of GDP and GNP, what could be called the visitor economy, that incorporates not just hotels but the whole array of activities that are related to visitors to the Island, probably makes a much greater contribution. Having this satellite account responds to the need in a regional economy to highlight sectors such as advanced services and tourism, that play a key role in the economy. An attempt at gauging the size of the visitor economy was made in 2016 for the Foundation for Puerto Rico, but this effort was cut short because of funding issues. The PRPB would be the lead, but the DMO, PR's Hotel and Tourism Association, the Paradores and other related stakeholders would have to be involved in the effort.

Flow of Funds Account

Although at the moment it is not reasonable to expect that a major overhaul of the SNA be commenced, it is felt that constructing a Flow of Funds account is a possibility. AAFAF, OCIF, the PRPB and Hacienda can do so relatively quickly and with little use of resources. As indicated, such an Account would provide major benefits in better understanding not only the Island's financial situation, but also in gauging the impact of reconstruction and CARES funds coming into Puerto Rico. AAFAF would most likely be the lead with the PRPB.

CONCLUSION

In sum, Puerto Rico's SNA is outdated. Many of the problems have to do with the fact that the PRPB's budget has been reduced in a context where little priority or attention has been given to the SNA by the various Administrations. As indicated,

given the post María, earthquakes, and COVID economic and reconstruction concerns, any efforts at a complete overhaul of the SNA would not be a priority at this moment. Thus, the recommendations above should be seen as transitional and efforts begun to go deeply into what a new and more relevant SNA would require.