THE ABSOLUTION OF HISTORY: CUBAN LIVING STANDARDS AFTER 60 YEARS OF REVOLUTIONARY RULE

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ABSTRACT

Six decades ago, Cuba initiated a momentous social and economic experiment. This paper documents the effects of the experiment on Cuban living standards. Before the revolution, Cuban income per capita was on a par with Ireland or Finland. Indeed, Cuba was one of the richest of the Spanish-speaking societies. Growth is glacially slow after the revolution as GDP per capita increased by 40 per cent between 1957 and 2017 equal to an annual growth rate of 0.6 per cent—among the lowest anywhere. To be sure, other dimensions of well-being such as education and health improved, yet broader welfare measures do not change the conclusion that the revolution impoverished Cuba relative to any plausible counter factual.

Keywords: growth and development, Cuba, capabilities

JEL Codes: N10, O40, O50

RESUMEN

Hace seis décadas Cuba inició un monumental experimento social y económico. Este estudio documenta los efectos de ese experimento sobre los estándares de vida cubanos. Antes de la revolución, el ingreso per cápita cubano estaba al nivel de Irlanda y Finlandia. De hecho, Cuba era una de las sociedades de habla hispana más ricas. Después de la revolución el crecimiento es glacialmente lento con solo cuarenta por ciento de crecimiento en PIB per cápita, igual a una tasa de crecimiento

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del 0.6 por ciento, entre los más bajos de todo el mundo. Sin duda, otras dimensiones más amplias del bienestar, como educación y salud, mejor-aron, sin embargo esto no cambia la conclusión de que la revolución empobreció a Cuba en relación a cualquier otro contrafactual.

Palabras clave: Crecimiento y desarrollo, Cuba, capacidades

«Condemn me, it does not matter: history will absolve me»
Fidel Castro (16 October 1953), closing words of speech delivered at his trial following the Moncada Barracks attack.

1. INTRODUCTION

The Cuban revolution is a defining event in 20th century Latin American history. For six decades, the revolution has fascinated intellectuals and academics producing an immense literature which continues to inspire debate[1]. For the most part, social scientists have neglected the economic consequences of revolutionary rule[2]. The omission is surprising because to evaluate the successes and failures of Cuban communism, we need to have some notion of how the revolution changed Cuban living standards. One reason why economic questions are absent from the general literature on Cuba is data. Consider the following, we do not have a satisfactory GDP or consumption series for the revolutionary economy. Along similar lines, there is no purchasing power parity (PPP) adjusted GDP comparison for revolutionary Cuba so we have only a rough idea of how Cuban income compares to other economies. In sum, we are ignorant of the most basic contours of the revolutionary economy.

The gaps in our knowledge hamper economic research on Cuba. Two examples should suffice. Jales *et al*. (2018) provide counterfactuals for the revolutionary economy. As a second example, Bologna Pavlik and Geloso (2018) study Cuban healthcare using a similar approach. Both stud-ies suffer from flaws in the existing GDP series.

This article fills in some of the blanks in the economic record. More pre-cisely, I make «controlled conjectures» about Cuban living standards as

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[1] One way to gauge general academic interest in Cuba is from the programs of the annual meet-ings of LASA, the Latin American Studies Association. Even a cursory examination of LASA pro-grams for most years shows as many articles on Cuba as there are on the Latin giants, Brazil and Mexico.

[2] Consider the fiftieth anniversary of the revolution in 2009 where Brundenius (2009) and Mesa-Lago (2009) are among the few articles marking the fiftieth anniversary who discuss the Cuban economy over the entire course of revolutionary rule. To be sure, there is a large volume of economic research on Cuba which mostly appears in the proceedings of the Association for the Study of the Cuban Economy (ASCE) but this work has had little impact on other social scientists.

measured by GDP, and consumption. I also investigate broader measures of capabilities including education and healthcare using the Human Development Index (HDI) of the United Nations. My goal is to place Cuban living standards, defined broadly, in proper comparative perspective. The results are tentative and subject to possibly large margins of error. Yet, I find enough information to render an unequivocal verdict on the Cuban experiment.

The core of the article takes data collected by Pérez-López (1987), the Central Intelligence Agency (henceforth the CIA) de-classified after the Cold War, and many other sources and uses it to construct GDP and consumption indices from 1957 to 1985. I do so by applying to Cuba various approaches developed by Western scholars to measure Soviet GDP. After 1985, I rely on the Cuban national accounts which are partly constructed along western lines. I say partly because Cuban indices differ in important respects from standard measures which require that I adjust the Cuban series to better approximate United Nations procedures.

To provide a GDP series for the six decades of revolutionary rule, I combine my GDP estimates for 1957-1985 with the adjusted Cuban national accounts after 1985. The resulting GDP series trace the evolution of the Cuban economy from initial revolutionary fervour, the rapprochement with the Soviet Union, the «special period» and its long aftermath to the alliance with Venezuela.

The results show disappointing growth. Income per capita fell in the early 1960s and it did not return to pre-revolutionary levels until 1976. From the early 1970s, the economy improves with massive Soviet aid and improved policy. By 1985, GDP per capita was 24 per cent above 1957. The late 1980s turned out to be a high-water mark for Cuba as the collapse of the Soviet Union and the cessation of Soviet aid produced a calamity—a 50 per cent fall in income during the «special period» of the early 1990s. In the aftermath of the special period, it has taken Cuba 30 years to regain the 1980s income peaks. Income per capita for recent years is about 15 per cent higher than the late 1980s—greatly helped by Venezuelan aid.

To sum up, Cuban GDP per capita increased by 40 per cent from 1957 to 2017 yielding an annual growth rate of 0.60 per cent. After 1970, the labour force participation rate increased due to slower population growth and the entrance of women to the labour force for earlier years. As a result, output per worker grows by less than income per capita. For recent years, it is slightly above its 1957 levels. In sum, Cuba has one of the slowest growth rates in the world economy over the six decades of revolutionary rule which means that Cuba has moved sharply down the world income distribution.

One way to grasp the extent of Cuba's relative decline is to compare Cuban living standards to the United States, Europe and Latin America before the revolution to its standing now. I show that Cuba of the late

1950s was, in relative terms, a fairly prosperous middle-income society with consumption on a par with Finland and Ireland and above Spain. Along with Puerto Rico and the Southern Cone, Cuba had the highest income of any Spanish speaking society. For recent years, Cuba is counted with Guatemala among the poor of the Western Hemisphere.

My estimates of Cuban GDP and PPP-adjusted living standards are tentative. More and better data will improve our knowledge. They are unlikely to change the finding that the revolution failed to improve Cuban living standards relative to any plausible counterfactual. Yet to render justice to the Cuban experiment, we must credit the revolution for its achievements in healthcare and education. The final section of the article sets the gains in health, and education against the stagnation in living standards where, following the lead of Prados de la Escosura (2015a, 2015b, 2019), I apply a broader measure of well-being based on the HDI of the United Nations. Cuba does better in this setting but not by much.

The HDI covers education and health along with income. As currently constituted, the HDI does not allow us to pass judgment on revolutionary Cuba since it does not consider the destruction of civil society and the suppression of basic liberties at the hands of the revolution. Taking such matters into account is a daunting task as economists do not have an accepted framework with which to balance income, health and education against personal freedoms. Even if we did, the Cuban record for health and education is contested and its achievements in these areas depend on the coercive power of the Cuban state. I sidestep these difficulties by applying an approach borrowed from the Cuban economist Carlos Diaz Alejandro (1973) based, in turn, upon insights associated with John Rawls. The results of this test are conclusive suggesting history will not absolve the revolution, or its guiding light—Fidel Castro.

2. TRACKING GDP AND CONSUMPTION

This section provides new GDP and consumption indices for 1957-1985. In addition, I modify Cuba's western-style national accounts, available at 1985, to bring them more in line with United Nations measures. The final step combines the 1957-1985 GDP series with the modified national accounts to cover the entire period of revolutionary rule. As will be clear, the resulting GDP series is tentative with potentially large errors. They are, however, sufficient for their purpose which is to determine broad trends in income and consumption after the revolution.

For the first three decades of the revolution, the Cuban authorities compiled their national accounts using the Soviet Bloc MPS (Material Product System). The estimates frustrated outside scholars as they were bedevilled

by changes in methodology, lapses in publication, opaque documentation and uncertainties about deflation[3].

2.1 GDP: 1957-1985

Measuring GDP for revolutionary Cuba faces two obstacles. Most fundamentally, Cuban prices are set by planners and are unlikely to reflect resource costs or consumer valuation[4]. A second issue is whether to trust data supplied by Cuba. The scholarly consensus is that the Cuban authorities do not falsify basic data in any systematic fashion. Rather, as Mesa-Lago (1969) and Pérez-López (1991) show, data are not published when it might embarrass the authorities. An example of this occurs during the «special period» of the early 1990s when Cuba ceased publication of many series. On the other hand, there is also a consensus that Cuban indices—industrial production, GDP, the CPI, etc.—must be viewed sceptically as they often exaggerate economic performance[5]. Of course, this tendency is not confined to planned economics but, as shown by Martinez (2019), appears to hold for autocratic regimes generally.

To get around the first problem, I construct GDP with pre-revolutionary 1957 prices. The resulting measure is conceptually valid as 1957 prices measure resource costs and consumer valuation in an acceptable fashion. On the other hand, early period prices come with a cost as relative prices change with planning. Even if that were not the case, any set of relative prices become outdated after three decades. For future reference, note that 1957 prices will overstate growth through the «Gerschenkron effect» named after the Russian economic historian where early period prices lead to higher measured growth rates as compared to late period prices[6]. The bias from 1957 prices will therefore exaggerate Cuban growth, perhaps considerably[7]. For my purposes, however, this is not a serious handicap as I prefer that if a bias exists it overstates Cuban achievements. On the other hand, there are other biases, particularly for industrial production, which will understate growth, so the overall effects are uncertain.

Following the literature on planned economies, I measure Cuban GDP from the output side. Table 1 provides the 1957 value-added weights

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[3] See Mesa-Lago (2000) or Pérez-López (1991).

[4] To avoid this issue for Soviet Union, Abram Bergson developed adjusted factor cost prices, see Bergson (1961). There are no adjusted factor cost prices for Cuba.

[5] These conclusions mirror the consensus in the literature on the Soviet Union and Eastern Europe, see Gregory and Harrison (2005).

[6] There is strong evidence that the Gerschenkron effect holds for planned economies, see Bergson (1961).

[7] Bergson (1961) provides the classic discussion of how to interpret GDP for a planned economy where he cautions against seeing GDP as a measure of welfare. Sanguinnetty (2019) discusses further limitations of GDP in the Cuban context.

TABLE 1
GDP WEIGHTS

	Weights I	Weights II
Agriculture		0.241
Sugar	0.129	
Non-sugar	0.112	
Manufacturing		0.244
Sugar	0.096	
Non-sugar	0.148	
Electricity		0.016
Construction		0.040
Transport and communication		0.055
Trade		0.157
Housing		0.074
Government and services		0.173
GDP		1.000

Sources: See online supplementary materials.

derived from various declassified CIA reports released after the Cold War (CIA 1968, 1970, 1972), Oshima (1961) and Ward and Devereux (2012). The sub-weights are discussed in the online Supplementary materials.

Agriculture and manufacturing dominated the Cuban economy before the revolution with sugar accounting for one half of agriculture and 40 per cent of manufacturing. To obtain GDP, I construct sectoral output indices and aggregate upwards[8]. The online Supplementary materials provide details. As discussed there, I apply a methodology developed by Nutter (1962), Moorsteen and Powell (1966) and Kaplan (1969) for the Soviet Union. Following their work, I construct sectoral gross output indices as a weighted average of quantity relatives using base year (1957) shares in value added (or gross output in the case of agriculture) as weights. GDP therefore rests on quantity data. For example, I measure sugar output by tons of sugar, steel by tons of steel and so on. Output data are widely available for Cuba and they are generally accepted by outside scholars[9].

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[8] Ideally, I would calculate GDP by deflating nominal magnitudes by appropriate deflators. This is not possible for Cuba.

[9] The best known example of the quantity approach is the Soviet Union where CIA analysts used it to provide the standard GDP measures used by Western researchers with generally well-regarded results, see Maddison (1998). Pérez-López (1987) applied a variant of the quantity

Equation [1] gives GDP in 1957 prices for year t where $Q(.)$ is the GDP quantity index, θ_j is the share of jth sector in 1957 value added, and p and x are prices and quantities.

$$Q(p^{1957}, x^t, x^{1957}) = \sum \theta_j^{1957} x_j^t / x_j^{1957} \qquad (1)$$

From 1957 to 1965, I take data from various declassified CIA reports supplemented by Brundenius (1984). Data are scarce for 1959 and 1960 due to the chaos in the Cuban statistical system. Things improve somewhat from 1961 to 1965. For example, Brundenius (1984) provides some series but their provenance is unknown and should be viewed cautiously. After 1965, more data are available, and I rely on the painstaking work of Pérez-López (1987) supplemented by Locay and Roberts (2012) along with the CIA annuals. Pérez-López collects data from a wide variety of sources starting at 1965 and ending at 1982. Locay and Roberts (2012) draw on a narrower collection of sources related more to consumption taken mainly from Anuario Estadístico de Cuba, but their data extend to recent years.

As discussed in the online Supplementary materials, the GDP index faces difficult issues of quality change, the introduction of new products and changes in the ratio of value added to gross output in addition to the index number problems discussed earlier[10]. The overall direction of possible biases in GDP is not clear, but they are potentially large.

2.2 The National Accounts 1985-2017

After the fall of the Eastern Bloc, Cuba switched to United Nations national accounting measures, albeit with distinctly Cuban features. The Cuban United Nations-style series start at 1985. They cover GDP from the expenditure and output sides. I focus on the output side measure to be consistent with the GDP index of the last section.

For most sectors, the output indices from the post-1985 national accounts seem to accord with standard United Nations procedures. Two problems remain[11]. First, the authorities publish series with different base year prices and with different United Nations (1968 and 1993)

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approach to Cuba. For recent years, Maddison and Wu (2008) provide applications to China. Of course, there is also a long tradition of output GDP measures in economic history. Examples include Feinstein (1972) for the UK and Broadberry *et al*. (2015) over the very long run for England.

[10] The problems are marked for industry and this index may well understate output growth.

[11] How accurate are the Cuban National Accounts given the distortions of a dual currency and rationing? The short answer is we do not know. Many of the problems are with nominal GDP, but these issues are less pressing for the output side indices considered in this article.

methodologies. In addition, revisions are frequent and large. To date, I found it difficult to construct a consistent series using official publications[12].

Second, and more importantly, there are methodological problems with the Cuban national accounts. First, Cuba does not value government-provided services such as healthcare and education at cost—rather it uses «social valuation» where Cuba calculates the value of goods and services provided by the public sector at Cuban-determined prices (Pérez-López and Mesa-Lago 2010).

The second problem is that, starting in the 2000s, Cuba obtains most of its foreign exchange from the export of services in the shape of doctors and other professionals to Venezuela, though Brazil was important to 2018. Cuba appears to count these exports as *domestic production* in the national accounts despite the fact the professionals are resident outside Cuba and hence revenue from this source might be better counted as factor income from abroad. As discussed in the online Supplementary materials, this biased GDP growth rates upward.

The solution to the first problem is straightforward—the United Nations provides a consistent series using data supplied by the Cuban authorities[13]. How the United Nations estimates are constructed is not obvious, but they are probably the best that one can hope for. To solve the second problem, methodological incompatibility, I assume that output in the affected sectors moves with the aggregate of all other sectors. The online Supplementary materials explain and justify this assumption. As it turns out, the revised GDP series shows slower growth rates as compared to the official series as the official index is 20 per cent higher in 2017 than the modified series.

2.3 Growth and the Revolutionary Economy

Figure 1 provides GDP per capita for the six decades of revolutionary rule by combining the new GDP index from 1957 to 1985 and the modified national account GDP series described above[14]. Although my focus in this article is on incomes rather than labour productivity, I also provide GDP per worker.

The estimates show that GDP per capita holds up for 1959 and 1960. By 1963, GDP per capita falls by 15 per cent with collectivisation, the U.S.

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[12] The Cuban data may be found at http://www.onei.gob.cu/.

[13] These data appear at https://unstats.un.org/unsd/snaama/Introduction.asp.

[14] Vidal (2017) provides Cuban GDP in current international prices corresponding to GDP measures used in earlier versions of the Penn World Tables (PWT). His estimates use the Cuban national account series which I believe to be flawed along with various times series adjustments which mean they are not comparable to standard volume measures of GDP.

FIGURE 1

GDP PER CAPITA AND PER WORKER—1957 TO 2017 (1957 = 100).
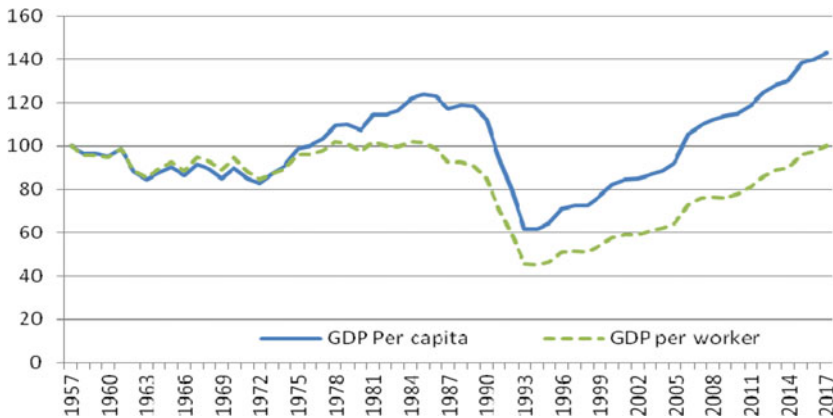
Sources: Author's calculations. The annual series are in the data appendix.

embargo, the exit of managerial and skilled workers and the chaos of the move to planning. There is a further decline in the late 1960s with the fiasco of the ten-million-ton sugar harvest. As a result, GDP per capita is below 1957 until 1976[15]. Growth improves in the 1970s when the Soviet Union steps up aid and Cuba moves to orthodox Soviet-style planning. The economy expands at solid rates until 1985 where income per capita is 24 per cent above 1957. Growth slows after 1985 with the political upheavals associated with the «rectification» program.

I measure output per worker as GDP divided by the economically active population, the labour force, as employment statistics are questionable especially after the special period. The labour force numbers are rough estimates as it is difficult to put together a consistent series after the 1970s. Note that the share of the Cuban population in the labour force increased from the early 1970s as population growth slowed and the labour force participation of women increased up to around 2010[16]. Figure 1 shows that output per worker is constant for the 1980s. By 2017, output per worker was only 5 per cent above 1957 levels, as labour productivity

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[15] The GDP index is consistent with Mesa-Lago's early account of the period from 1960 to the mid-1970s, Mesa-Lago (1972, 1981). Dominguez (1993) provides an equally harsh verdict on the revolutionary economy for these years while Mesa-Lago (2000) is a definitive overview.

[16] Female labour force participation dropped after 2010. The latest (2018) edition of *Anuario Estadístico de Cuba* shows a drop in the female labour force participation rate from 60.5 in 2010 to 49.5 in 2018. The ratio of the labour force to population fell from 46 to 40 per cent during this period.

has hardly increased in over six decades[17]. Soviet assistance is crucial for the improved performance of the 1980s. As shown in the Supplementary materials, Soviet aid increases from 10 per cent of GDP in the early 1960s to 28 per cent in the early 1980s[18].

The good years for Cuba end when the demise of the Soviet Union halts Soviet aid and sets Cuban enterprises adrift from their Eastern Bloc suppliers. At the same time, the Cuban government was denied access to world capital markets or to loans from the IMF or World Bank. The combination of shocks produced an economic collapse—the «special period». GDP fell by 50 per cent between 1988 and 1993. The official national accounts show a 40 per cent decline.

The recovery from the «special period» is glacially slow as the Cuban economy picks up steam only with aid from Venezuela which starts in the early 2000s. Cuba reaches its 1985 GDP per capita (barely) in 2012. By 2017, GDP is 15 per cent above 1985. Another way of looking at the Cuban record is to observe that GDP per capita in Figure 1 is below 1957 levels for 33 of the 59 years of revolutionary rule.

The GDP growth rates of this article are below Brundenius (1984), Pérez-López (1987), Zimbalist and Brundenius (1991) and the Cuban national accounts. To illustrate the differences, I combine Brundenius (1984) for 1957-1965, Pérez-López (1987) from 1965 to 1982 and the unadjusted national accounts to 2017. I term this series Alternative I. The second series, Alternative II, substitutes Zimbalist and Brundenius (1991) for Pérez-López (1987)[19]. It shows yet higher growth rates.

Figure 2 compares the earlier GDP series with my estimates. The first series, Alternative I, shows a ratio of income per capita in 2017 to 1957 of 2.35 compared to my estimate of 1.43. The second series, Alternative II, shows a ratio of 3.05, close to the average growth rate among all economies in the Penn World Tables (PWT) for the period.

Below are growth rates for GDP per capita over sub-periods from the various sources (Table 2):

The online Supplementary materials (Table A6) reconcile my GDP estimates with earlier series. To summarise, the differences with Pérez-López

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[17] Given that human capital increased it is tempting to infer that total factor productivity fell over these years. But the data do not allow me to make that statement. The estimates of employment are problematic. In addition, I do not have satisfactory estimates of the capital stock since the investment data is poor. A further problem is that much of the capital stock becomes obsolete after the special period when access to spare parts, etc., declines.

[18] For early discussions of Soviet aid, see Ritter (1990) and Pérez-López (2001).

[19] Cuban growth generated heated debates during the 1970s and 1980s. Jorge Pérez-López, along with Carmelo Mesa-Logo, was subjected to harsh attacks for allegedly understating GDP growth and more generally the achievements of revolutionary Cuba, see Zimbalist (1988) and Zimbalist and Brundenius (1991) where the work of Pérez-López and Mesa-Lago is derided as «Cubanology».

FIGURE 2

GDP PER CAPITA—1957 TO 2017 ALTERNATIVE ESTIMATES (1957 = 100).
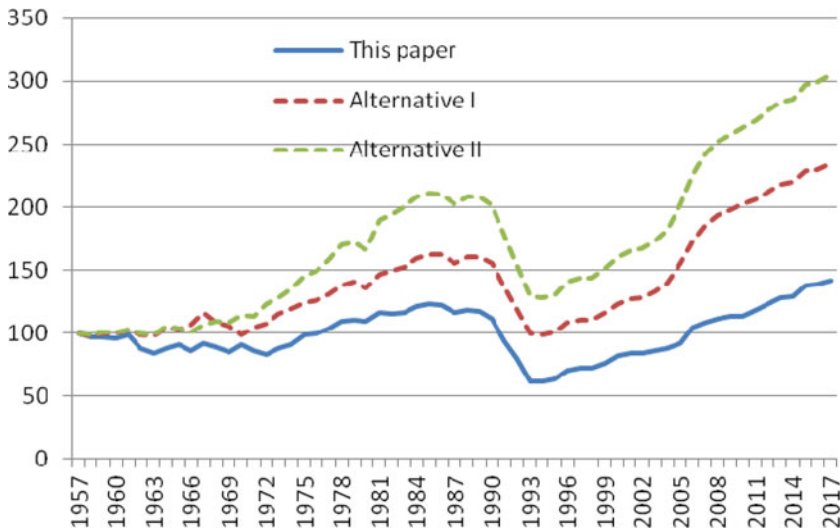
Sources: see data appendix for sources. Note for Series I Pérez-López (1987) reaches only to 1982. For 1982 to 1985 I use National Accounts.

(1987) arise because he shows higher growth rates for services and agriculture while omitting slow-growing sectors such as housing. In addition, I show that industrial production growth from Brundenius (1984) and Zimbalist and Brundenius (1991) is too high. They also rely on flawed official Cuban indices for other sectors which further overstates growth[20]. Finally, and as mentioned earlier, the official national accounts since 1985 exaggerate growth for health, education and government services.

The implausibility of earlier GDP series can be seen in a simple fashion. Suppose that some version of the alternate GDP series is correct. From Figure 2, GDP per capita for 1993, the worst year of the «special period», is equal to 1957 using Alternative series I and is 30 per cent above 1957 using Alternative series II. These results are close to impossible. After all, Cuba experienced terrible hardships during the «special period». Calories were below 2,000 (Sixto 2002) as Cuba came close to mass starvation. The crisis decimated public transportation and public utilities. Cars disappeared from the streets. Sales of clothing and consumer durables

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[20] Mesa-Lago (2000) provides a careful overview of this literature along with much of the data.

TABLE 2
COMPARING GROWTH RATES FOR GDP PER CAPITA

	Brundenius (1984)	Pérez-López (1987)	Zimbalist and Brundenius (1991)	National accounts	This article
1957-1965	0.7				−1.2
1965-1985	3.2	2.2	3.3		1.0
1985-2017				1.4	0.6

Notes: The estimates for Brundenius (1984) cover from 1965 to 1981.

ceased[21]. Thus, it is hard to see how GDP per capita for 1993 could be above the relatively prosperous late Republic. In contrast, my estimates for 1993 show income per capita is 40 per cent below 1957—consistent with what we know about the special period.

To summarise, Cuba has grown at slow rates since the revolution. To put the Cuban record into comparative perspective, I turn to Version 9.0 of the PWT which provides data on GDP per capita for 110 economies from 1960 and 2014[22]. From 1960 to 2014, Cuban GDP per capita increases by 36 per cent using the GDP index of this article[23]. For Taiwan and Korea, GDP increased by multiples of fifteen. For Spain and Portugal, income increased fourfold. For most developing economies, income increased three to fourfold. For the United States, income per capita trebled. For slow-growing economies such as Argentina and Uruguay, income per capita doubled. In terms of growth rates, Cuba comes in at 100 out of the 111 cases[24]. In short, revolutionary Cuba has an exceptionally poor economic record.

2.4 Consumption

There are three reasons to consider consumption separately from GDP. First, the consumption estimates are largely independent of the GDP measures of the last section. Second, consumption is more closely related to welfare than GDP. Finally, consumption avoids some of the difficult conceptual problems

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[21] Then, as now, Cuba imported most of its food, consumer durables and industrial inputs. Imports in real terms fell by 70 per cent between 1989 and 1993 underlying the magnitude of the crisis.

[22] I start with 1960 rather than 1959 as PWT coverage increases dramatically after 1960.

[23] Cuba is not in the current PWT.

[24] In terms of growth, from 1960 to 1989, Cuba does poorly relative to other planned economies where GDP per capita on average doubled.

FIGURE 3
CONSUMPTION PER CAPITA—1957 TO 1985.
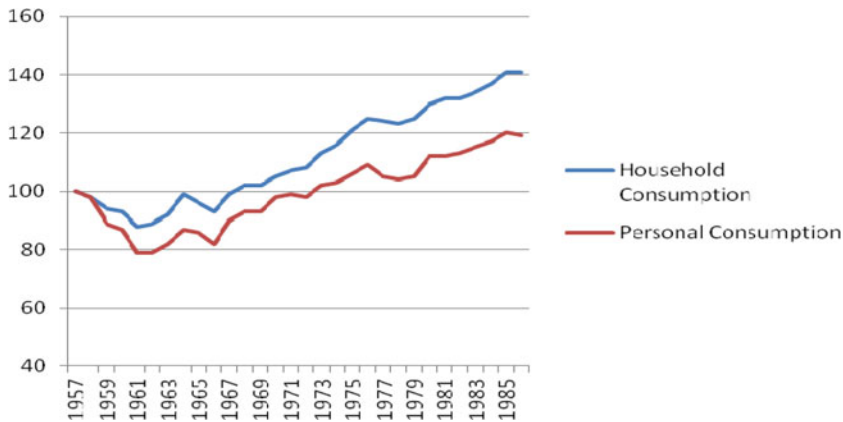
Sources: Author's calculations. The annual series are in the data appendix.

associated with Cuban GDP. Most notably, consumption is not distorted by terms of trade changes and it better reflects the receipt of Soviet aid.

I measure consumption from 1957 to 1985 using 1957 prices. Throughout, I follow the procedures developed by CIA analysts in their work on Soviet consumption (Schroeder and Denton 1982). The consumption index consists of quantity relatives weighted by base year shares in consumption. I create the sub-indices using quantities such as food measured in kgs, passenger kms for travel, etc. Data are mostly from the sources used for the GDP index.

I provide two measures of consumption, *household consumption* which is spending by households and *total consumption* which adds publically supplied education and healthcare to household consumption.

Figure 3 traces the series for consumption per capita from 1957 to 1985.

The results differ from GDP. Household consumption drops by 20 per cent in the early 1960s compared to a 15 per cent drop for GDP as the revolutionary authorities increase investment and government spending at the expense of consumption. It recovers its 1957 levels by 1973 and increases thereafter. Household consumption peaks in 1985 where it is 20 per cent above the late republic. As discussed in the online Supplementary materials, the increase in personal consumption is largely underwritten by Soviet aid[25].

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[25] As the revolution re-distributed income, it is certainly possible, and perhaps probable, that the consumption of the poorest segments of society, particularly the rural poor, increased in the early 1960s.

The improvements in household consumption understate consumer well-being as Cuba increased spending on healthcare and, especially, education after the revolution. Including education and healthcare, total consumption falls by 12 per cent in the early 1960s. Moreover, total consumption is back to its 1957 levels by 1968. By 1985, it is 40 per cent above 1957.

The official series for consumption begins in 1985. I was unable to modify the national accounts to provide a useable series for consumption after 1985. But there is little reason to suppose that the performance of consumption differs much from income.

To sum up, Cuba has seen anaemic GDP growth over the 60 years of the revolution. Slow growth means that revolutionary Cuba has slipped down the world income distribution. The next section makes this point directly.

3. AN EUROPEAN MIRROR

I compare Cuban income and consumption to the outside world for 1955 and 2011. The comparisons sharpen the picture of Cuba's relative decline. They also provide an independent estimate of Cuban growth. Finally, they are a vital ingredient to the broader welfare comparisons, covering education, health and personal liberties, that follow.

As a standard, I compare Cuba to Iberia and Latin America. I also compare Cuba to Western Europe. The European mirror brings into sharper focus the fact that Cuba and the Southern Cone once shared similar living standards with middle-income European economies. Finally, the advanced economies of Europe were once the countries to which Republican Cuba aspired (Speck 2005).

3.1 The Comparisons

I compare income and consumption. I chose 1955 as this year has the widest coverage prior to the Cuban revolution while 2011 is the latest round of the International Comparison Program (ICP). The comparisons cover thirty-eight countries. There are three sources for 1955. The high-quality estimates of Gilbert and Kravis (1954, 1958) cover the major European economies. Latin America is from Braithwaite (1968) and is of somewhat lower quality. Dewhurst *et al.* (1961) provide rough estimates for other European economies prepared for, but not reported in, Gilbert and Kravis (1958). In addition, I use Bergson (1972) for the Soviet Union. For Cuba, I use the Ward and Devereux (2012) estimate for 1955.

For 2011, I use ICP estimates with the exception of Puerto Rico and Cuba. My source for Cuban 2011 PPP-adjusted income per capita is the United Nations Human Development Report (HDRO). The HDI report

puts 2011 Cuban GNI per capita at $6,821. This is one-half of Costa Rica ($14,006) and is below Jamaica ($8,350). As discussed in section 4 of the online Supplementary materials, it may overstate Cuban income. Again, if there is a bias, I prefer it to work in the direction of overstating Cuban income[26]. For both years, Puerto Rico is from Devereux (2019)

I compare income using GDP rather than GNI as I do not have GNI for 1955. There are, however, three countries where I use GNI: Cuba, Puerto Rico and Ireland. GNI makes more sense because of large factor income outflows for Ireland and Puerto Rico and inflows for Cuba. I discuss the relationship between GDP and GNI for Cuba in section 6 of the online Supplementary materials. Finally, all comparisons compare income using the relative prices of the comparison year[27]. The 1955 comparisons are bilateral Fisher Ideal indices while the 2011 ICP comparisons are generalised Fisher Ideal indices.

As we might expect, the United States has a commanding lead for 1955. Western European income/consumption averages 50-60 per cent of U.S. levels. Next are the middle-income economies, Argentina, Cuba, Puerto Rico and Uruguay in Latin America and Ireland, Finland, and Italy in Europe. For these economies, income/consumption is 30-35 per cent of the United States, that is, 60-70 per cent of Western Europe.

At 35 per cent of the United States, Cuban consumption for 1955 equals Ireland. It exceeds Italy, Greece, Spain and Portugal in Europe. It is close to Austria and the Netherlands. Thus, Cuba shares with Puerto Rico and the Southern Cone the highest consumption level for Spanish-speaking societies.

The 1955 Cuban ranking is not controversial. Oshima (1961), for example, provides an early PPP-adjusted measure of Cuban GDP for 1953 which placed Cuban income levels at those of Italy[28]. Using a «short cut» methodology, Locay (2009) also reached similar rankings to Table 3. Finally, contempory observers for the 1950s saw the island as a middle-income economy[29].

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[26] Cuba has two currencies—the CUC and the Peso. Vidal (2017) provides a formula to calculate an average exchange rate based on the share in GDP of each sector of the island's economy that handles CUCs or pesos. He estimates GDP per capita for 2011 at $5,973 PPP adjusted, below the $6,821 of this study. The more general point is that there is now wide agreement that Cuba is a relatively poor economy by Latin American standards.

[27] There are strong theoretical arguments in favour of the current price measure, see Feenstra *et al*. (2015).

[28] This view is not shared by some scholars sympathetic to the revolution. For example, Eckstein (1993, Table 1) puts income per capita for Cuba at the time of the revolution at tenth in Latin America. Brundenius (1984, Table 6.1, p. 123) puts 1960 GDP below Mexico and Peru.

[29] The seminal studies of the World Bank (1951) and the U.S. Department of Commerce (1956) took it for granted that Cuba in the 1950s was a middle-income economy—the wealthiest country of the tropics.

By 2011, Norway leads in income while the United States leads in consumption. The Western European economies have partly caught up to the United States while Spain and Ireland are closer to the European leaders. For Cuba, the striking feature of Table 3 is relative decline. Cuba is no longer a middle-income economy and income per capita equals Guatemala or Paraguay. Thus, Cuba has fallen behind Greece, Spain and Ireland, Portugal and most of Latin America. Indeed, the only remaining Latin economies with lower incomes are Bolivia, Honduras and Nicaragua.

3.2 Implied Growth Rates

The series for Cuban GDP of the last section are tentative with unknown, but potentially large, margins of error. Fortunately, Table 3 provides a crosscheck. Suppose for the moment, that the income comparisons in Table 3 are without error and that all comparisons are transitive. It is easy to show that if we know relative Cuban income in 1955 and 2011 and if we have a GDP series for each partner country, then we can calculate an implied Cuban GDP growth rate which can cross-check the results of previous sections.

To see how this works, take Uruguay. For 1955, the ratio of income per capita for Uruguay to Cuba from Table 3 is 1.25. For 2011, the ratio is 2.5. Using the PWT, the ratio of Uruguayan GDP per capita in 2011 to 1955 is 2.29. A simple calculation shows that the implied ratio of Cuban GDP per capita in 2011 to 1955 is 1.15 as compared to a ratio of 1.34 using the Cuban GDP series of the last section[30].

There are thirty-eight comparisons in Table 3. The PWT provides GDP series for thirty-five of these economies yielding thirty-five implied Cuban growth rates in the final column of Table 3[31]. The results show some differences in implied growth rates as the standard deviation of the comparisons is 0.32. This is expected given the complexities of comparing GDP over time and across space[32]. On the other hand, we expect errors in the

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[30] The PWT provides two income measures. rgdpe is expenditure-side real GDP at chained PPPs (in US$2011 million). rgdpna is real GDP at constant 2011 national prices (in US$2011 million). The correct series for the calculations is rgdpe. For Argentina and El Salvador, the rgdpe series show income per capita increased sixfold and tenfold, respectively. This is an error. In their stead, I use the rgdpna series for these economies which shows income per capita doubles.

[31] Cuba and Puerto Rico are not in the latest PWT. There are no GDP series connecting the Soviet Union with Russia.

[32] The explanation of why comparisons over space, between countries, and over time, within countries, are not transitive is that they rely on different sets of prices and weights and use different procedures, see Feenstra *et al.* (2009) and Deaton and Aten (2017).

TABLE 3
GDP AND CONSUMPTION PER CAPITA—1955 AND 2011 (United States = 100)

	GDP per capita		Consumption per capita		Implied ratio of Cuban GDP per capita
	1955	2011	1955	2011	2011/1955
Belgium	53	81	52	70	1.49
Denmark	51	84	54	70	1.33
France	49	73	51	71	1.53
Germany	51	82	48	76	1.87
Italy	29	68	29	64	1.41
Netherlands	47	87	43	69	1.28
Norway	55	124	54	83	1.34
United Kingdom	57	70	59	70	1.44
Argentina	31	36	35	36	0.96
Bolivia	7	11	8	10	1.13
Brazil	9	29	9	26	1.20
Chile	23	41	28	37	1.23
Colombia	12	23	14	21	0.86
Costa Rica	16	26	18	27	0.90
Cuba	**27**	**14**	**35**	**14**	Na
Dominican R.	9	22	8	26	1.14
Ecuador	11	20	11	18	1.14
El Salvador	10	15	11	19	0.70
Guatemala	10	14	12	17	1.07
Honduras	7	9	8	10	0.86
Mexico	17	33	23	32	0.81
Nicaragua	10	8	12	10	0.57
Panama	15	31	18	28	1.66
Paraguay	9	14	11	15	1.54
Peru	12	22	12	19	1.24
Puerto Rico	30	34	37	46	na
Uruguay	34	35	41	34	1.15
Venezuela	28	34	22	27	0.96
Austria	na	86	42	74	1.95
Finland	na	78	35	71	1.18

TABLE 3
GDP AND CONSUMPTION PER CAPITA—1955 AND 2011 (United States = 100)
(Cont.)

	GDP per capita		Consumption per capita		Implied ratio of Cuban GDP per capita
Ireland	na	72	35	62	1.62
Portugal	na	52	17	50	1.30
Spain	na	65	22	58	1.22
Sweden	na	84	55	72	1.27
Switzerland	na	104	56	79	1.10
Greece	na	54	15	57	0.98
S. Union/Russia	29	45	21	41	na
United States	100	100	100	100	1.54

Notes and Sources: The table compares real income and consumption using current prices. I use GDP per capita to measure income for all countries except Cuba, Ireland and Puerto Rico in 2011 where I replace GDP with GNI. The 1955 comparisons are Fisher Ideal comparisons of income and consumption while 2011 is a multilateral generalisation of the Fisher Ideal called the Elteto Koves and Szulc (EKS) index. The 1955 benchmarks are from Ward and Devereux (2012) with the following exceptions. For Puerto Rico, I use Devereux (2019). For Austria, Finland, Greece, Ireland, Spain, Sweden, Switzerland and Portugal, I use Dewhurst *et al.* (1961). For Cuba in 2011, I use the UN Human Development Report estimates. This relates to GNI. I assume that it also holds for relative consumption. I take the 2011 results from http://siteresources.worldbank.org/ICPEXT/Resources/ICP_2011.html, as data necessary to calculate the Fisher Ideal for 2011 are not available. Argentina is not in the 2011 ICP and I take income from the UN HDI where I assume relative income equals consumption. The final column gives the ratio of Cuban GDP per capita in 2011 to 1955 as implied by the GDP comparisons and growth rates from the Penn World Tables where I measure growth using the rgdpe measure which is expenditure-side real GDP at chained PPPs (in US$2011 million). I use rgdpna which is real GDP at constant 2011 national prices (in US$2011 million) for Argentina and El Salvador for reasons explained in the text.

comparisons to partly offset[33]. The point is that Cuba does poorly in all comparisons. At the extremes, Nicaragua implies a Cuban income ratio of 0.57 while Austria has an implied income ratio of 1.95. Thus, upper and lower bounds imply glacially slow growth by international standards.

To summarise, I define the implied growth rate of Cuban GDP per capita from 1955 to 2011 (G_c) as the simple average of implied growth

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[33] This calculation is closely related to the projection procedure used by Maddison (1995, 2007) to compare income over time and space. Maddison (2007) starts with an estimate of relative income levels for his base year 1990 and growth rates for all comparison countries. He uses GDP growth rates to calculate income *levels* in the past. In contrast, I have income *levels* for 2 years and growth rates for the partner countries but not Cuba. This allows me to calculate the implied growth *rate* for Cuba rather than the GDP level in the past. The underlying logic is, of course, the same.

rates from all possible calculations ($g_{c,i}$) in Table 3.

$$G_c = 1/n \sum g_{c,i} \qquad (2)$$

Across all comparisons, the ratio of implied Cuban GDP per capita for 2011 to 1955 is 1.23[34]. The GDP series of the last section implies a ratio of 1.34 for Cuban income in 2011 to 1955. The close correspondence while pleasing is coincidental. More generally, one should interpret the results as being consistent with claims of slow Cuban growth. Of course, a lower estimate of relative Cuba income for 1955 in Table 3 or a higher estimate for 2011 will change the results but it is unlikely to change them by much since the 1955 comparison is conservative and the 2011 comparison likely overstates income.

Once we accept that income growth since the revolution is, at best, mediocre then the case for the revolution rests on healthcare and education.

4. CAPABILITIES

Well-being does not depend solely on income or consumption. Accordingly, this section enlarges the discussion to include healthcare and education. One measure of health is life expectancy. Cuban life expectancy is impressive (79 years for 2011) given its low income. The island also performs well on measures of educational attainment such as average years of education. The broader comparisons turn out to improve Cuba's standing for 2011, but not by much.

The most widely accepted broad measure of development is the HDI of the United Nations where the HDI measures «capabilities» by considering education and health in addition to income. The HDI is the geometric index, given by equation [3], of income (Y) as measured by Gross National Income (GNI), health as given by life expectancy (H) and education given by average years of education (E) and expected years of education (not included).

$$HDI_i = (Y.H.E)^{1/3} \qquad (3)$$

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[34] Using the rgdpna series, I obtain lower implied Cuban growth rates as the average ratio of implied income in 2011 to 1955 for Cuba is 0.95. In other words, Cuban growth rate is negative suggesting that Cuban GDP per capita for 2011 is below the late 1950s. The conclusion that income declined over this period is in line with Mesa-Lago's (2009) verdict on the revolutionary economy.

The UN scales the sub-indices to ensure they are bounded between zero and one using the transformation of the ith element given by [4].

$$\text{Index}_i = (\text{Actual Value}_i - \text{Minimum Value}_i)/ \qquad (4)$$
$$(\text{Maximum value}_i - \text{Minimum Value}_i)$$

I use the HDI as my organising framework. To begin, I provide standard HDI measures for 2 years, 1955 and 2011, for the economies of the last section[35]. As mentioned, I lack GNI for 1955 so I use GDP. For 2011, I measure income with GNI for Cuba, Ireland and Puerto Rico for reasons explained earlier. In addition, I use average years of education only as expected years of education are not available for 1955. Finally, I follow the United Nations by measuring income using logs. I will return to this assumption later.

Table 4 provides the HDIs for 1955 and 2011. To ease interpretation, I give rankings from the highest to the lowest. For 1955, the United States leads followed by Western Europe. Cuba is a respectable twentieth of thirty-eight economies. It trails Uruguay and Argentina in Latin America—principally because Cuban life expectancy (62.3) is below Uruguay (67) and Argentina (64.5)[36].

The Cuban standings for education and life expectancy for 1955 were lower than its income would suggest. By 2011, the opposite holds. Cuban life expectancy at 79 equals the United States. It is above Latin America except Costa Rica. Cuba (11.3) also leads Latin America in years of education except for Puerto Rico (13). Indeed, Cuba ranks higher than Portugal (7.8) or Spain (8.5). The Cuban outcomes for health and education are therefore characteristic of a wealthy society—impressive for a poor island. For 2011, Cuba ranks third in the index for Latin America below Puerto Rico (13th!) and a little behind Chile. It is above Portugal. These findings are similar to Prados de la Escosura (2015a)

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[35] I draw on Prados de la Escosura (2015a, 2015b, 2019) for micro foundations. He provides a variant of the UN HDI measure, the Historical Human Development Index, which is more suited to really long-run historical comparisons.

[36] I use the following upper and lower bounds taken from the United Nations.

	Min	Max
Life expectancy	20	85
Mean years of education	0	15
GDP	100	75,000

TABLE 4
CUBA AND HUMAN DEVELOPMENT—1955 AND 2011

	Year	HDI 1955			HDI 2011
1	United States	0.731	1	Switzerland	0.930
2	Switzerland	0.699	2	Norway	0.921
3	Germany	0.674	3	Germany	0.921
4	Norway	0.674	4	United States	0.909
5	United Kingdom	0.665	5	Sweden	0.894
6	Denmark	0.665	6	United Kingdom	0.894
7	Sweden	0.664	7	Denmark	0.892
8	France	0.649	8	Netherlands	0.883
9	Netherlands	0.645	9	Finland	0.882
10	Belgium	0.615	10	Austria	0.876
11	Austria	0.612	11	Belgium	0.856
12	Ireland	0.608	12	Ireland	0.853
13	Finland	0.578	13	Puerto Rico	0.850
14	Argentina	0.540	14	France	0.850
15	Soviet Union	0.539	15	Italy	0.819
16	Uruguay	0.535	16	Greece	0.814
17	Italy	0.534	17	Spain	0.808
18	Spain	0.515	18	Russia	0.783
19	Greece	0.506	19	Chile	0.779
20	**Cuba**	**0.492**	**20**	**Cuba**	**0.760**
21	Puerto Rico	0.489	21	Argentina	0.759
22	Chile	0.482	22	Portugal	0.755
23	Panama	0.431	23	Venezuela	0.748
24	Paraguay	0.415	24	Panama	0.745
25	Costa Rica	0.413	25	Uruguay	0.725
26	Venezuela	0.410	26	Mexico	0.720
27	Portugal	0.394	27	Costa Rica	0.720
28	Colombia	0.388	28	Peru	0.709
29	Ecuador	0.379	29	Ecuador	0.680
30	Mexico	0.379	30	Brazil	0.667
31	Brazil	0.337	31	Colombia	0.665
32	Peru	0.326	32	Dominican R.	0.658

TABLE 4
CUBA AND HUMAN DEVELOPMENT—1955 AND 2011
(Cont.)

	Year	HDI 1955			HDI 2011
33	Bolivia	0.306	33	Paraguay	0.646
34	Dominican R.	0.305	34	Bolivia	0.615
35	El Salvador	0.285	35	El Salvador	0.610
36	Nicaragua	0.283	36	Nicaragua	0.573
37	Guatemala	0.265	37	Guatemala	0.565
38	Honduras	0.256	38	Honduras	0.558

Notes and Sources: The table compares income from Table 3 by using U.S. GDP per capita from the PWT to scale the results. Life expectancy and average years of education for 1955 are from the Clio website at https://clio-infra.eu/. Life expectancy and years of education for 2011 are from the UN HDI dataset at: http://hdr.undp.org/en/content/human-development-index-hdi. For Puerto Rico, I use Devereux (2019).

who found Puerto Rico and Cuba with the highest human development for Latin America[37].

Can education and health rescue the revolution? Not necessarily. There are four objections to the Cuban HDI rankings. First, there are questions about Cuban healthcare and education. For healthcare, Gonzalez (2015) makes a persuasive case that biased reporting reduced measured Cuban infant mortality rates hence overstating life expectancy, perhaps by a year or so. Even making this adjustment, Cuba does well relative to Latin America. If life expectancy is overstated by 2 years, an upper bound, then the Cuban ranking for 2011 falls to 21. On the positive side, Cuba provides access for all Cubans to basic healthcare without racial or income disparities and most scholars accept that the gains in healthcare are real[38].

For education, the Cuban performance at the elementary level at first glance is excellent[39]. Most notably, UNESCO (2008) shows that Cuba had the highest third and sixth grade math and reading scores for Latin

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[37] Prados de la Escosura (2015a) uses a different measure of education and as well as a different transformation of education and health.

[38] Berdine *et al*. (2018) provide a more negative evaluation of the Cuban healthcare system than I do. It is true that Cuban healthcare is deficient in many respects. Corruption is endemic. Infrastructure is decaying and patients resort to black or grey markets. Since the early 2000s, many doctors were diverted abroad. In early 2019, matters worsened as even the most basic medicines such as aspirins and basic hygienic items are no longer available. But other adjustments will raise Cuba's standing. For example, Ghislandi *et al*. (2019) compare countries in terms of inequality in life expectation where Cuba does very well.

[39] See Carnoy and Wertheim (1975) and Carnoy *et al*. (2007).

America and the Caribbean which has impressed many observers. But recent work by Peterson (2020) has gone some distance to undermining these results. In addition, the evidence for high school and college education is mixed. Universities lack proper facilities with poor libraries, few textbooks and little connection to the Internet. The quality of instruction is also questionable. On the other hand, Locay and Devereux (2018) use U.S. labour market outcomes to provide evidence on Cuban educational quality which suggests that the quality of education is at least equal to the late Republic.

Second, it might be argued that we should compare the revolutionary outcomes to the counterfactual of what would have occurred had the Republic survived. Income per capita would surely be higher in the absence of revolution. Sceptics might also claim that health might not be much different given the well-developed Cuban health system of the 1950s as evidenced by the low levels of infant mortality in Republican Cuba (McGuire and Frankel 2005)[40]. For education, I suspect that the arguments for the revolution are stronger—at least at the primary level. It should also be kept in mind that the revolutionary state likely realised the gains in education and health sooner than would alternative governments and that it also allowed better access to disadvantaged groups such as Afro-Cubans and the rural poor.

Third, the HDI results require diminishing returns to income. As the United Nations states:

> The idea is to emphasize the diminishing marginal utility of transforming income into human capabilities. This means that the concave logarithmic transformation makes clearer the notion that an increase of GNI per capita by \$100 in a country where the average income is only \$500 has a much greater impact on the standard of living than the same \$100 increase in a country where the average income is \$5,000 or \$50,000[41].

There is, to be sure, empirical support for diminishing marginal utility of income, (Layard *et al.* 2008). One might, however, use the same argument for education and for health as measured by longevity. One extra

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[40] McGuire and Frenkel (2005) and especially Prados de la Escosura (2015a) show the Cuban healthcare paradox is long standing. There are two possible explanations for this. First, Cuba had a large and well-developed private healthcare system early on. Indeed, Oshima (1961) suggests that private spending on health was 10 per cent of private consumption for the early 1950s—high by international standards. The second explanation is the public health system put in place under American rule. Something similar seems to have occurred with U.S. health interventions in Puerto Rico, see Marein (2020).

[41] http://hdr.undp.org/en/content/why-hdi-using-logarithm-income-component.

year of education, when average years of education are four, is likely to have a larger impact on capabilities compared to where average years of education are fifteen[42]. Yet, the HDI requires diminishing returns to income as without it, income dominates the rankings. Suppose that per capita income is an input that produces capability. It follows that per capita income enters the index at a declining rate since its return in terms of capabilities must diminish as education and health are bounded[43]. In what follows I assume diminishing returns as without it capabilities do not matter.

The final, and in my view the most important, objection to the HDI for Cuba is that it ignores personal freedoms. Over its six decades, revolutionary Cuba has exercised close control over its citizens at the block and household level working through local Committees for the Defense of the Revolution and its large and well-funded security forces[44]. Revolutionary Cuba remains a society where dissent is criminalised, and where the authorities enforce compliance with the dictates of the state apparatus. Moreover, the Cuban institutions also appear to be outliers in their all-encompassing nature[45].

A further complicating factor is that the reduction in Cuban inequality for the first decades of the revolution along with the improvements in health and education owes much to the regimes ability to control the behaviour of its citizens through harsh coercive means. One way to see this is with healthcare where the Cuban successes for life expectancy are partly due to the astonishing number of Cuban doctors. Any relaxation in the power of the state will lead to an outflow of doctors to countries where they are better paid. A more controversial question is whether the Cuban authorities reduced infant mortality through forced abortions and the confinement of expectant mothers in maternity homes[46]. If the high Cuban levels of education and health depend on coercion, many of the achievements of the revolution will perish with relaxation in state control.

Suppose personal freedom is as important for human capabilities as income, education and healthcare. The HDI becomes [5] where F

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[42] The assumption of diminishing returns to income sometimes produces counter-intuitive results. For example, in the 2011 rankings, Puerto Rico ranks above France, Italy and Spain.

[43] See the discussion by Prados de la Escosura (2015b, 2019).

[44] For Cuba, personal freedoms have waxed and waned. Recent years have seen a relaxation and the growth of a nascent civil society, see Betancourt (2019). The Committees for the Defense of the Revolution may no longer inspire fear, but the security services are still going strong.

[45] Mesa-Lago (1998) points out that Cuba had remarkably high levels of collectivisation and centralisation relative to other communist states. Indeed, he goes further to suggest that Cuba led most Communist regimes in these categories.

[46] Kath (2006) and Hirschfeld (2007a, 2007b) are among the few sociologists to observe the Cuban health system at close quarters. Their reports are troubling as they provide instances of what appeared to be compulsory abortion and sterilisation.

measures personal freedoms and where HDI II refers to the extended HDI[47].

$$\text{HDI II} = (\text{Y.H.E.F})^{1/4} \qquad (5)$$

There is no agreement on how to measure personal freedom and many possible measures exist. I prefer the Heritage Foundation index of economic freedom as it encompasses economic and personal freedoms. The choice is debatable. Yet, the results will not change using alternative indices as Cuba scores low on all[48]. To show this, I also use the Freedom House index of political rights. The Supplementary materials (Table A10) provide the results using a third measure—the Polity index.

Table 5 provides the 2011 results with the extended HDI. The first panel gives the results with the Heritage index as HDI IA while the second panel HDI IB gives the Freedom House results. In each case, Puerto Rico leads Latin America. As we might expect, Cuba does poorly. It comes in at 34 out of 38 using the Heritage index. The only countries below Cuba are Guatemala, Bolivia, Honduras and Nicaragua. Cuba is last using the Freedom House index.

5. THE VERDICT OF HISTORY

Progressive circles hailed the Cuban revolution in the belief it would raise living standards for the Cuban masses. Over the succeeding decades, these hopes have faded[49]. Unlike the twenty-fifth anniversary of the revolution, nowadays one hears few positive evaluations of the Cuban economy. The reason is straightforward. Before the revolution, Cuba was a prosperous economy by the standards of its time. Six decades later, it is one of the poorest economies in Latin America. In short, the revolution impoverished Cubans at least in a relative and perhaps in an absolute sense. Given the high expectations that greeted its birth, the economic record of the revolution is profoundly disappointing[50].

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[47] Independently, Prados de la Escosura (2019) provides an extended HDI. His approach is to mine in that he addresses the general question of how to incorporate personal freedoms into broader measures of development whereas my approach relates specifically to Cuba and has less relevance in other contexts.

[48] The other index which emphasises economic as well as personal freedoms, the Economic Freedom of the World index from the Fraser Institute, does not include Cuba.

[49] Even scholars sympathetic to the revolution concede Cuban economic performance over the last six decades is disappointing, see Brundenius (2009) or Thompson (2005).

[50] With hindsight, the relative prosperity of the 1980s came largely from Soviet support. The recovery after the special period is facilitated by Venezuelan largesse.

TABLE 5
HUMAN DEVELOPMENT FOR 2011 INCLUDING FREEDOM

		HDI IA			HDI IB
1	Switzerland	0.898	1	Switzerland	0.941
2	United States	0.868	2	Norway	0.940
3	Germany	0.867	3	Germany	0.934
4	Norway	0.860	4	Sweden	0.920
5	Denmark	0.856	5	United Kingdom	0.919
6	United Kingdom	0.854	6	Denmark	0.918
7	Sweden	0.849	7	United States	0.913
8	Finland	0.843	8	Netherlands	0.911
9	Netherlands	0.843	9	Finland	0.910
10	Austria	0.833	10	Austria	0.894
11	Ireland	0.827	11	Belgium	0.890
12	Puerto Rico	0.812	12	Ireland	0.882
13	Belgium	0.811	13	France	0.874
14	France	0.791	14	Puerto Rico	0.868
15	Chile	0.781	15	Spain	0.847
16	Spain	0.773	16	Italy	0.844
17	Italy	0.758	17	Greece	0.829
18	Greece	0.738	18	Chile	0.824
19	Portugal	0.721	19	Portugal	0.805
20	Uruguay	0.717	20	Uruguay	0.785
21	Panama	0.712	21	Panama	0.776
22	Mexico	0.706	22	Costa Rica	0.766
23	Costa Rica	0.706	23	Argentina	0.763
24	Russia	0.702	24	Peru	0.719
25	Peru	0.701	25	Mexico	0.715
26	Colombia	0.672	26	Brazil	0.703
27	Argentina	0.670	27	Dominican R.	0.680
28	Brazil	0.642	28	Colombia	0.674
29	Dominican R.	0.641	29	El Salvador	0.667
30	Paraguay	0.636	30	Ecuador	0.659
31	El Salvador	0.623	31	Paraguay	0.647
32	Venezuela	0.621	32	Bolivia	0.641

TABLE 5
HUMAN DEVELOPMENT FOR 2011 INCLUDING FREEDOM
(Cont.)

		HDI IA			HDI IB
33	Ecuador	0.618	33	Venezuela	0.619
34	**Cuba**	0.591	34	Guatemala	0.574
35	Bolivia	0.576	35	Nicaragua	0.547
36	Guatemala	0.573	36	Honduras	0.543
37	Nicaragua	0.570	37	Soviet Union/Russia	0.538
38	Honduras	0.563	38	**Cuba**	0.324

Notes: The first panel uses the Heritage index obtained at https://www.heritage.org/index/. The second panel gives the freedom house results using the index for 2014 at https://freedomhouse.org/.

The case for the regime therefore rests on health and education[51]. Cuban life expectancy is impressive given current Cuban income levels. The Island also performs well on some educational outcomes. These achievements are real. But to evaluate the revolution along these dimensions, we must compare the revolutionary outcomes to the counterfactual of what would have occurred had the Republic survived. Any counterfactual which attempts to chart the progress of Cuban income, education and health over the six decades after the revolution is fraught[52]. Even if we could construct such counterfactuals, there is no agreement how to incorporate personal freedoms into broader measures of development.

Fortunately, there is a way to render a verdict on the Cuban experiment that avoids such intractible problems. Four decades ago, the distinguished Cuban economist Carlos Diaz Alejandro (1973, p. 91) showed how to evaluate the effects of the Cuban revolution on the welfare of Cubans without a counterfactual. Drawing on the insights of John Rawls, he suggested the following thought experiment: «Consider a mental experiment in

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[51] Cuban redistributive policies likely increased the incomes of the poor and particularly the rural poor relative to their levels of the late 1950s for the opening decades of revolution. These trends were reversed after the «special period» where access to foreign exchange from relatives abroad and employment in tourism-related activities are not equally distributed and where rationing becomes less important.

[52] Jales *et al.* (2018) provide counterfactuals for GDP growth using difference-in-differences, synthetic controls, factor models and panel data forecasting approaches. There are two problems with their approaches. First, they rely on deeply flawed measures of Cuban GDP. Second while their counterfactuals may be informative for the first decade or so of revolutionary rule, their usefulness for 60 years is more open to question since it is doubtful that any statistical procedure can accurately predict growth over a 60-year horizon. Bologna Pavlik and Geloso (2018) provide an application of this methodology to healthcare.

which one is to choose where to be reborn as a new baby, but without knowing where that miracle will occur in a rich or poor family in city or country…. Would one choose Guatemala, Brazil or Cuba?».

His choice was Cuba. The problem with his choice lies in his comparison countries[53]. To see why, suppose the comparison is done today and countries on the list are Cuba on the one hand and Chad and the Central African Republic on the other, then the choice would surely be Cuba. The result tells us less about Cuba than it does about the poverty of the comparison countries. Similarly, suppose the choice is between Cuba and Latin American economies that currently score low on the HDI of Table 4, Honduras, Guatemala or Nicaragua. It is again possible for the choice to be Cuba. A better approach is to restrict comparisons to countries with similar initial conditions before the Cuban revolution. From Tables 3 and 4, the relevant comparisons are Argentina/Chile/Uruguay/Puerto Rico-Cuba or Italy/Spain-Cuba or Ireland/Finland-Cuba. It is hard to see how Cuba could be preferred in any of these comparisons. Thus, history is more likely to condemn than to absolve the Cuban revolution.

SUPPLEMENTARY MATERIAL

The supplementary material for this article can be found at https://doi.org/10.1017/S0212610920000233.

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[53] Rawls (1971, p. 60) also assumed that the following liberties exist before any choice can be made—«political liberty (the right to vote and hold public office) and freedom of speech and assembly; liberty of conscience and freedom of thought; freedom of the person, which includes freedom from psychological oppression and physical assault and dismemberment (integrity of the person); the right to hold personal property and freedom from arbitrary arrest and seizure as defined by the concept of the rule of law.» Revolutionary Cuba does poorly on this list.

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