What Went Wrong – Cuba Living Standards over the Very Long Run

John Devereux
Department of Economics, Queens College, CUNY, Flushing
New York, New York, 11367-1597

This paper provides a long run comparative perspective on Cuban living standards-defined broadly to include education and life expectancy. Over the last century, Cuba has gone from a middle income economy to a poor one with most of the relative decline occurring after the revolution. There are two paradoxes associated with this reversal of fortune. The Republican paradox is that the Cuban elites underprovided education and perhaps healthcare relative to income. The revolutionary paradox is that the revolutionary elites overprovided education and healthcare relative to income. I argue that both paradoxes have their roots in Cuba's governing elites.

First Draft, December 21, 2021

1. *Introduction*

Cuban history did not begin with the revolution. To understand Cuba's current predicament it surely helps if we can form a clearer picture of the Cuban past. Central to recent Cuban history is Cuba's reversal of fortune during the twentieth century where Cubans journeyed from relative affluence to relative poverty. The descent of Cuba is seen clearly in the statistics on national income. The Maddison Project is the standard source for long run GDP data.[1] It provides data on GDP per capita for 69 countries for before the First World War. In the 115 years from 1913 to 2018, all countries in the Maddison Project saw a rise in their GDP per capita. For this sample, the median ratio of GDP per capita in 2018 to 1913 is eight. Some countries, such as South Korea, saw income per capita increase thirty fold. GDP per capita for the European countries increased on average from eight to ten times and so on. Cuba income per capita has barely doubled over these years. As a result, Cuba has the third lowest growth rate of any country in the Maddison Project for these years. Only Syria and North Korea did worse.[2] Thus, Cuba experienced the largest downward movement in the world income distribution of any country over the last century with most of the slide occurring after 1959.

This paper takes a closer look Cuba's reversal of fortune by examining how living standards, broadly defined, have fared since the formation of the Republic.

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[1] The Maddison Project continues the work of the late Angus Maddison (1991, 1995.2003). The latest release may be found at: https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2020

[2] I take Cuban GDP per capita from Devereux (2020) who revises down the official estimates. All other estimates are from the 2020 release of the Maddison project.

Throughout, I view the Cuban record through the lens of the Human Development Index (HDI) of the United Nations – a measure of wellbeing that includes education and life expectancy as well as income. I use a broader comparative perspective than usual as I compare Republican Cuba to Europe and the Southern Cone (Argentina, Chile and Uruguay) and I compare revolutionary Cuba to the planned economies of Eastern Europe.

I find that Cuba's reversal of fortune is associated with two paradoxes. Along with the Southern Cone, Cuba began the twentieth century as the wealthiest society of the Spanish speaking world with material living standards close to Norway or Sweden in Europe. Initially, Republican Cuba and the Southern Cone lagged middle income European economies for education and life expectancy. As the twentieth century advanced, the Southern Cone reversed these deficits. For Cuba, the disparities eased over the lifetime of the Republic, but they did not go away. This is the Republican paradox – the Republic underprovided education and perhaps healthcare.

After the revolution, the Cuban economy stagnates and Cuba falls sharply in the world income distribution. I argue that there is an underappreciated puzzle here communist economies generally grew at substantial rates but not Cuba. Yet despite this dismal economic record, Cuba did better on life expectancy and years of education than did Eastern Europe or developing economies generally. This is revolutionary paradox.

The next section introduces the Human Development Index (HDI). The following section examines wellbeing for Republican Cuba - documenting impressive Cuban living standards combined with large deficiencies in other dimension of wellbeing. I conclude

by addressing the question of whether Revolutionary Cuba is exceptional. I conclude that Cuba is exceptional for life expectancy but not for education. More generally, I argue that the central puzzle of the Cuban revolution is why, despite being in absolute control for sixty years, the revolutionary elites have not acted like a stationary bandit, along the lines of Olsen (1993, 1995), by not investing in economic growth. On the other hand, they have invested heavily in education/healthcare.

2. Cuba and the Historical Human Development index

To place the Cuban economy in comparative perspective, I turn to the human development index (HDI) of the United Nations (U.N).[3] The HDI adds education and health to income to form an index of wellbeing. I use the HDI because it is the most widely used broad measure of development.[4] Keep in mind, however, that the HDI does not measure welfare given that it lacks satisfactory micro-foundations.[5] In addition, there are long standing questions about the comparability over time of the underlying HDI data, particularly years of education. Are years of education for the U.S in 1870 really comparable to 2017?. Are years of education for Korea in 2017 comparable to those for Honduras? For my purposes, however, the HDI is a useful framework since it

[3] I will not go over the complicated history of Cuba in the early U.N HDI measures as this is admirably summarized by Mesa Lago (2002). Betancourt (1996, 2004) applies the HDI to Cuba concentrating on recent decades. Devereux (2019) considers the HDI for revolutionary Cuba focusing on the quality of the Cuban measures for education and life expectancy.

[4] Prados De La Escosura (2021) surveys the extensive historical HDI literature.

[5] Jones and Klenow (2016) provide a measure that compares welfare internationally. The data necessary to apply their approach to historical periods does not exist. An earlier paper in the cross country welfare literature is Becker, Philipson, and Soares (2005)

moves the discussion of living standards away from a narrow focus on income/consumption and towards a broader concept of wellbeing. While the HDI is not a welfare measure, the fact that education and life expectancy matter for wellbeing is not in dispute. As will be clear, adding these variables reveals unique aspects of Cuba's journey.

Economic historians welcomed the HDI. The historical HDI literature begins with Crafts (1997) who provides an index reaching back to 1870 for currently developed economies and continues to the present. The most prominent recent contribution is Prados De La Escosura (2015a, 2015b, 2021) who uses the HDI to study long growth. I differ from work in economic history in that my focus is on a single country, Cuba, and second, in that I focus on comparisons over space at a point in time whereas the history literature look at comparisons over space but also over time.

The HDI, given by equation (1), is the geometric index of income (Y) per capita as measured by purchasing power parity (PPP) adjusted Gross National Income (GNI), health as given by life expectancy (H) and, education (E) as average years of education multiplied by expected years of education.[6]

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

Following the U.N, I use life expectancy to measure health.

[6] Crafts (1997) uses an earlier version of the HDI while Prados De La Escosura (2015a, 2015b and 2021) uses different variable definitions.

I measure the other variables as follows:

Education: Education is average years of education. I omit expected years of education as it is not available for early years.

Income. The U.N uses purchasing power parity (PPP) adjusted GNI to measure material living standards. Along similar lines, the historical HDI literature uses PPP adjusted GDP per capita from the Maddison dataset (Maddison (1991, 1995, 2003) or from the Maddison project.[7] In contrast, I use *actual individual consumption* which is household consumption plus education, health and other items provided by the government. I use consumption rather than GNI for two reasons. Conceptually, consumption is a better index of welfare than is GDP per capita, see Jones and Klenow (2016). This is particularly the case for planned economies such as Cuba. Second, consumption is measured more accurately than is GDP for the historical national income measures of this paper.

The Maddison project does not provide consumption. In response, I gather consumption from sources detailed in the appendix. I differ from previous work in a further respect as I compare living standards with current prices. By current prices, I mean contemporary prices. For instance, I compare consumption for 1910 with 1910 prices and I use 1980 prices for 1980 and so on.[8] The HDI compares wellbeing across space at a point in time. This requires current price measures. The reliance on current

[7] These data are available at: https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2018. I.

[8] The Maddison GDP estimates use 1990 prices.

price measures is in line with best practice in the international comparison literature, see recent editions of the Penn World Tables (PWT).

Following the U.N, I scale the HDI sub-indices to ensure that they are bounded between zero and one using the transformation from (2).

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

Below are the upper and lower bounds. The bounds for life expectancy and education are from the U.N. For GNI, the U.N upper and lower bounds are $100 and $75,000 in PPP adjusted 2017 dollars. For consumption, I use lower bounds at $100 and $50,000 in 2017 US PPP adjusted dollars.

	Min	Max
Life expectancy	20	85
Mean years of education	0	15
GDP	$100	$50,000

Following the U.N, I measure material living standards in logs thereby imposing diminishing returns. This is consistent with the welfare literature, see Jones and Klenow (2016). The assumption is important as it weakens the role of material living standards.

The next section uses the HDI to situate Republican Cuba in the world income distribution for three benchmark years, 1910, 1929 and 1955.

3. The Republic in Retrospect

The first panel of Table 1 provides the HDI for 1910. It covers fourteen relatively rich economies from Western Europe and the Western Offshoots. The table also provides the components of the HDI – consumption per capita in PPP adjusted current prices expressed in 2017 PPP adjusted U.S dollars, years of education and life expectancy. The consumption estimates are current price Fisher Ideal indices from Ward and Devereux (2021). For Ireland I use Devereux (2021). I take years of education, defined as the average years of education for people of working age (15-64), from Lee and Lee (2016).[9] Clio-infra supplies life expectancy.

I order countries by the HDI. The consumption ranking is in parenthesis next to the country name. The first panel covers all the rich economies for 1910 with the exception of New Zealand.[10] As expected, the Western Offshoots, Australia and the U.S top the consumption rankings. Next, are Great Britain and Belgium – the early industrializers. Bringing up the rear are Norway and Sweden with Italy at a considerable distance.

The HDI rankings for these countries partly reverse the consumption rankings. To be sure, the Western Offshoots do well for the HDI and they do well for consumption. Yet, Norway is the top ranked economy for the HDI while its consumption

[9] I use years of education from Lee and Lee (2016) rather than Tamura et al. (2019) as Lee and Lee (2016) are more consistent with the UN education data. Fortunately, the results are similar from both sources. For early years, however, there are large differences in years of education between Lee and Lee (2016) and Morrison and Murtin (2009) who form the basis for the Clio-Infra estimates.

[10] For 1910, the U.K consists of England, Scotland and Wales. It excludes the entire island of Ireland whereas the estimates for 1929 and later include the 6 counties of Northern Ireland.

rankings is only 12th. Similarly, Sweden is ranked 3rd despite its consumption ranking of 13th. Great Britain and Belgium score well on consumption but low on the HDI.

Table 1

Computing the HDI for 1910

HDI rank	Country	consumption	life expect	Years of education	HDI
1	Norway (12)	3,232	58.0	6.4	0.518
2	U.S (2)	4,848	51.8	6.8	0.516
3	Sweden (13)	3,232	57.8	4.5	0.460
4	Canada (5)	3,974	52.5	4.8	0.457
5	Australia (1)	5,023	56.6	3.9	0.451
6	Switzerland (9)	3,450	52.9	4.5	0.442
7	Netherlands (11)	3,276	55.1	3.8	0.425
8	Great Britain (4)	4,368	53.3	3.6	0.422
9	Denmark (7)	3,931	58.0	3.2	0.418
10	Germany (10)	3,319	49.0	3.7	0.397
11	Belgium (3)	4,455	51.3	3.1	0.393
12	France (6)	3,974	51.3	2.9	0.382
13	Ireland (8)	3,494	53.8	2.2	0.350
14	Italy (14)	2,053	46.7	2.0	0.298
	Argentina	2,960	44.2	1.8	0.290
	Uruguay	NA	52.0	1.5	0.276
	Cuba	2,469	36.0	1.6	0.237
	Chile	2,527	30.0	2.4	0.234

The HDI and the consumption rankings differ for 1910 because the richest economies in terms of consumption do not always have the highest life expectancy, nor are they always the most educated. Consider life expectancy. This varies from 58 years in Scandinavia to 49 in Germany. For education, there is a difference of 2.8 years

between Norway and Great Britain. Thus, Norway and Sweden do better for the HDI than they do for consumption. Great Britain and Belgium score poorly on the HDI for the opposite reason.

The second panel of Table 1 has data for Cuba and the Southern Cone. Unfortunately, there are no current price 1910 consumption benchmarks for these countries. To fill the gap, I extrapolate their 1929 consumption benchmarks, described later, to 1910 using GDP per capita. The resulting estimates are conjectural and they indicate orders of magnitude only.[11]

While the consumption estimates for Cuba and the Southern Cone are approximate, they suggest that consumption levels were 50 to 60 percent of U.S levels and 60 to 70 per cent of Western Europe. Argentina is above Italy and not far off Norway and Sweden. While these conclusions are tentative, they hold with improved data for 1929. Observe that Cuba is the only tropical society in Table 1. This deserves underlining as a tropical location is widely held in the literature to be an obstacle to development either through the direct impact on health and agricultural productivity, see Sachs (2001), or through its indirect impact working through institutions along the lines suggested by Acemoglu, Johnson and Robinson (2001), Easterly and Levine (2003) and Rodrik, Subramanian, and Trebbi (2004).

The striking feature of Table 1, however, is how poorly Cuba and the Southern Cone do on other dimensions of the HDI – years of education and life expectancy.

[11] Ideally, the projections to 1910 should adjust volume GDP for changes in the external terms of trade. This is possible only for Cuba. Allowing for terms of trade changes, Cuban consumption would be about twenty percent higher in 1910 than shown in Table 1.

Consider years of education.[12] At 1.6 years, Cuba is the lowest in Table 1 below even Italy. There is a five year difference with the U.S. Life expectancy is also low for Cuba and the Southern Cone with the exception of Uruguay. There is a 20 year difference in life expectancy between Cuba and Norway. The difference is 30 years for Chile. As discussed later, as a tropical society, Cuba faced a different disease environment so life expectancies may not be strictly comparable. Nonetheless, the differences in wellbeing implied by the lower life expectancy and years of education for Cuba, and the Southern Cone, are large.

Cuban entrepreneurs, particularly for sugar, created the high material living standards of the early Republic, see Dye (1988) or Zanetti and Garcia (1998). The puzzle is why Cuba's impressive growth before the late 1920's is not reflected in either education or life expectancy.

The puzzle deepens with the 1929 benchmark.

The 1929 HDI

Table 2 provides the 1929 HDI. The Table covers 32 countries. It includes all of the rich economies for 1929, along with Eastern Europe and the Soviet Union. The sources for education and life expectancy are Lee and Lee (2016) and Clio-infra. Consumption is from Devereux (2021) who updates Colin Clark's (1940, 1951) pioneering purchasing power parity adjusted income comparisons.

[12] The weak performance of Latin America for education has attracted considerable attention in the education literature. Lindert (2004, 2010) summarizes this work.

Table 2

Computing the HDI for 1929

		Consumption	Life Expectancy	Years of education	HDI
1	U.S (1)	6,892	58.5	7.9	0.597
2	Switzerland (10)	4,204	60.2	7.7	0.576
3	New Zealand (4)	5,100	63.1	6.8	0.576
4	Norway (12)	3,515	62.5	6.9	0.557
5	Australia (5)	5,031	63.1	6.0	0.552
6	Canada (2)	5,445	57.9	6.4	0.542
7	Sweden (7)	4,480	62.3	5.6	0.531
8	UK (3)	5,238	57.6	5.4	0.511
9	Germany (11)	3,515	59.5	5.6	0.505
10	Austria (15)	3,102	56.5	5.6	0.486
11	Denmark (8)	4,411	61.9	4.3	0.481
12	Netherlands (14)	3,377	62.2	4.5	0.479
13	Belgium (6)	4,618	55.0	4.3	0.456
14	Czechoslovakia (19)	2,619	55.6	4.5	0.441
15	Ireland (13)	3,446	58.3	3.8	0.438
16	France (9)	4,204	54.2	3.9	0.436
17	Hungary (24)	2,274	50.2	5.0	0.427
18	Argentina (17)	2,939	52.6	3.7	0.407
19	Japan (28)	1,335	45.7	5.0	0.379
20	Finland (16)	3,033	51.3	3.1	0.378
21	Poland (27)	1,585	49.8	3.9	0.377
22	Italy (22)	2,343	52.3	3.1	0.373
23	Spain (23)	2,343	49.4	3.3	0.370
24	Uruguay (21)	2,365	50.0	3.1	0.365
25	Greece (26)	1,861	50.0	3.0	0.351
26	Bulgaria (33)	949	48.3	3.5	0.333
27	Cuba (20)	2,559	42.0	3.0	0.327
28	Chile (18)	2,824	35.0	4.1	0.323
29	Romania (32)	1,103	42.0	3.5	0.313
30	Portugal (29)	1,333	49.4	1.3	0.256
31	Soviet Union (30)	1,241	37.4	1.9	0.239
32	Turkey (31)	1,241	31.2	0.6	0.139

I order countries by the HDI where the Western Offshoots along with Norway, Sweden and Switzerland lead. Consumption ranking are in parenthesis and here the Western offshoots are ahead too.[13] Cuba (20), Argentina (17) and Chile (18) are in the top twenty economies for consumption while Uruguay is 21st. As with 1910, Cuba and the Southern Cone lead the Spanish speaking Societies in material living standards.

Judged by consumption, Cuba and the Southern Cone are similar to Austria, Hungary and Finland in Europe. The HDI rankings for Argentina and Uruguay are similar to their consumption rankings suggesting that, unlike 1910, their levels of education and life expectancy are now in line with consumption.[14] In contrast, the large differences the HDI and consumption rankings remain for Cuba (-7) and Chile (-10). Life expectancy for Cuba and Chile is twenty years and thirty years respectively behind the leaders, with the caveat that as a tropical society Cuba faced a different disease environment. For education, Cuba lags even the poor Eastern European economies - Romania, Poland and Bulgaria. The only comparable divergence between the HDI and consumption rankings for 1929 is in the opposite direction for Switzerland, Norway, Hungary, and Japan where life expectancy and education raise their HDI standing as compared to consumption.

[13] I measure consumption in 2017 U.S dollars throughout. This is a normalization using the consumption series from the U.S national accounts. The current price measures allow comparisons to be made across space at a point in time but they should not be used for comparisons over time. In other words, we should not calculate growth rates for countries in Tables 1 and Table 2 as, for index number reasons, the resulting growth rates will not equal those in the national accounts except for the U.S.

[14] Lindert (2010) reaches the opposite conclusion but that is because he relies on income from the Maddison dataset which show incomes for Argentina and Uruguay above France and Germany for the first quarter of the twentieth century. The Maddison estimates appear to be in error. Madison uses a 1990 benchmark year. If we use an earlier benchmark year, as do Astorga, Berges and Fitzgerald (2005), we obtain results for income that are close to the consumption rankings in Table 2.

1955 provides the final benchmark covering the Republic.

The 1955 HDI

Table 3 provides the top 30 economies for 1955 ranked by the HDI. The main sources for consumption are Gilbert and Kravis (1954, 1958) for the U.S and Western Europe, Dewhurst et al. (1961) for the smaller European economies, Braithwaite (1967) for Latin America and the CIA (CIA (1963)) for Eastern Europe. I fill gaps for some individual countries from the sources described in the data appendix. The 1955 benchmarks covers all of the rich economies except New Zealand and Japan. But Japanese income is well below Cuba.

By 1955, the U.S had established a large consumption lead. The U.S is followed by the Western Offshoots. By then, consumption for Cuba and the Southern Cone is at the level of Finland or Ireland. The relative position of Cuba did not change much from 1929 as Cuba's slow growth is matched by slow growth elsewhere. Cuban consumption is forty percent of the U.S and it is sixty percent of Europe. Cuba remains above Iberia and, with the exception of Czechoslovakia, the planned economies.

Table 3

Computing the HDI for 1955

HDI Rank		Consumption	Life Expectancy	Years of Education	HDI
1	United States (1)	10,669	69.6	9.1	0.704
2	Switzerland (5)	5,975	70.1	9.1	0.675
3	Canada (2)	8,108	70.0	8.1	0.665
4	Australia (3)	6,798	70.2	8.4	0.664
5	Norway (8)	5,761	73.4	7.5	0.644
6	Sweden (6)	5,868	72.6	7.3	0.636
7	Germany (11)	5,121	68.9	7.5	0.619
8	United Kingdom (4)	6,295	70.1	6.7	0.613
9	Belgium (9)	5,548	68.5	7.2	0.613
10	Netherlands (12)	4,588	72.5	6.2	0.590
11	Ireland (19)	3,734	68.0	6.7	0.578
12	Hungary (22)	2,844	66.9	7.4	0.575
13	Austria (13)	4,481	67.6	5.6	0.552
14	Denmark (7)	5,761	71.9	4.8	0.550
15	France (10)	5,441	68.4	4.6	0.526
16	Poland (23)	2,621	65.9	5.8	0.524
17	Uruguay (14)	4,374	67.1	4.8	0.519
18	Argentina (16)	3,734	64.5	5.2	0.519
19	Italy (20)	3,094	68.2	4.7	0.505
20	Greece (33)	1,600	67.2	5.8	0.500
21	Czechoslovakia (15)	4,363	69.0	4.1	0.499
22	Finland (18)	3,734	67.4	4.1	0.486
23	S. Union/Russia (27)	2,240	64.8	4.6	0.472
24	Romania (28)	2,063	63.3	4.8	0.471
25	Bulgaria (32)	1,780	64.8	4.8	0.468
26	Chile (21)	2,987	56.2	5.0	0.468
27	Spain (25)	2,347	66.7	4.0	0.461
28	Cuba (17)	3,734	62.3	3.7	0.452
29	Panama (30)	1,920	59.5	4.3	0.435
30	Costa Rica (29)	1,920	60.1	3.8	0.421

The HDI rankings for Argentina (18) and Uruguay (17), and to a lesser extent Chile (21), are similar to their consumption rankings. This is not true for Cuba which is 17th for consumption but 28th for the HDI. For education, Cuba scores the lowest of all economies in Table 3 and average years of education are three years behind Ireland and a year and a half behind Argentina. As further evidence of Cuba's education lag, the 1953 census found that 25 percent of Cubans were illiterate. This is shocking by the standards of middle income Europe.[15] Illiteracy for Argentina and Uruguay for this year are 10 percent - also high compared to, say, Ireland.

For life expectancy, Cuba is six years behind Ireland. It is ten years behind the leader Norway, keeping in mind the caveats about the Cuban disease environment. Consequently, Cuba shows lower HDI rankings than its consumption would suggest. As noted above, Cuba shows the largest difference the consumption and HDI rankings in Table 3 reflecting the fact that late Republican Cuba had the material living standards of a middle income economy but the education levels and life expectancy of a poor one.

Summing up for the Republic

The fact that Republican Cuba was a middle income economy with material living standards well above Latin America outside of the Southern Cone might surprise readers of recent academic research on Cuba where the notion of Cuba as a middle income

[15] Moreover, the census definition of literacy for Cuba was a weak one suggesting that illiteracy might be under-stated.

country, common in the 1950's, has vanished.[16] To be sure, it is sometimes acknowledged that Republican Cuba was close to the top of Latin America for some indicators, but this is not the same as saying that material living standards for Cuba and Southern Cone exceeded Italy and Spain, or that Cuban income was closer to Western Europe than to the rest of Latin America.[17] Yet, the point is an important one as situating Cuba in this way changes how we view the historical record. After all, Argentina has long been viewed through the lens of a reversal of fortune. If this is true for Argentina, then it is doubly true for Cuba since Cuba has fallen further in the world income distribution. Once we accept Republican Cuba's middle income status as a fact then the question becomes "what went wrong"? In particular, why did Republican Cuba not converge despite its early start, its stable macroeconomy and its strong entrepreneurial traditions?

On the other hand, the HDI partially undercuts optimistic visions of the Republic by showing that Cuban wellbeing lagged other middle income countries. This is true for the 1900's. It is true for the 1950's too. It marks a crucial difference between Cuba and

[16] Cuba's middle income status was taken for granted by contemporary observers in the 1950's. The World Bank's (1951) Report on Cuba and the U.S Department of Commerce (1956) held this view, see also Oshima (1961). Ward and Devereux (2012) and Locay (2009) provide some quantitative support for such claims. Along similar lines, Speck (2005) shows that the Cubans of the 1920's saw themselves in sight of Western European income levels.

[17] One searches the recent literature on Republican Cuba in vain for the idea that Cuba, outside of the great depression, was a relatively prosperous society in material terms at least. For a recent example consider Bustamante (2021) who discusses the opinions of Cuban exiles without investigating whether their views may have contained some grains of empirical truth where the economy is concerned. Republican Cuba may not have been a rich economy but it was not poor either and the Cuban middle class almost certainly saw their living standards decline after the revolution because of the drop in GDP and because of the redistribution of income towards poorer and more disadvantaged areas and groups.

Argentina/Uruguay where the early deficits in life expectancy and education faded over time.

Education exemplifies the failings of the Republic. Why did the Cuban political system underprovide education given the prominence of education in the 1940 constitution? Was it racial or class divides? Was it an urban bias? Was education less productive in rural areas given the reliance on sugar? Did the prevalence of certain tropical diseases hamper learning? Equally important, how did the deficiency in human capital impact on growth and political stability? Did it contribute to the revolution and the eclipse of political and human rights?

The issues with life expectancy are more complicated because, as a tropical nation, Cuba was subject to a different disease environment than other middle income economies. Given this, life expectancy may not be informative about policy since it is possible that low life expectancy for the early years might be attributed to diseases endemic to tropical societies. In support of this possibility, is the fact that Cuba was always well supplied with doctors, albeit they were concentrated in Havana. In addition, Oshima (1961) shows that by the 1950's Cuban spending on health was high by international standards. The fact that Republican Cuba had a well-developed medical system at least for later years is further supported by infant mortality data. The Cuban rate is 39 per thousand births for 1960.[18] This is the lowest rate in Latin America. Uruguay is next at 48 and Argentina is third with 60, see McGuire and Frankel (2005).[19]

[18] While infant mortality rates for middle income European countries such as Ireland (26) and Finland (17) were lower than Cuba for 1960, this again might well be due to the fact that Cuba faced a more intractable tropical disease environment.

If Republican Cuba underprovided education and, perhaps, healthcare the revolution reversed these patterns.

4. Revolutionary Cuba

To put the revolutionary Cuba in proper context, I provide HDI rankings for five years – 1980, 1996, 2005, 2011 and 2017. I take actual individual consumption from the International Comparison Program (ICP). Where ICP consumption data are missing, I use the Penn World Tables (PWT) – adjusted to actual household consumption. The Cuban estimates pose special difficulties that I describe in the appendix. In total, I have 140 countries. The coverage is less than the U.N HDI which has 189 countries since I exclude countries where population is less than one million and countries where consumption estimates are not available or are clearly deficient. Life expectancy and years of education for 1980 are from Lee and Lee (2016) and Barro and Lee (2010). After 1980, they are from the U.N HDI data base.

To summarize, Figure 1 compares Cuba's consumption and HDI rankings for the benchmark years where, for comparison, I include 1929 and 1955. I compare rankings for each year since the HDI is best suited to comparisons across space at a point in time rather than comparisons over time.

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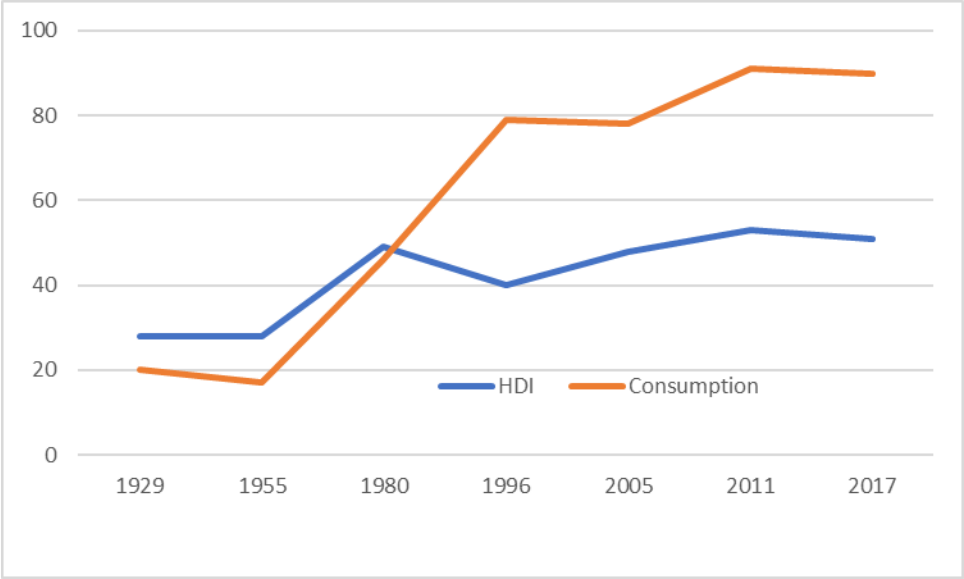
[19] The literature for Cuba, summarized by McGuire and Frankel (2005), shows a remarkable rise in life expectancy over the last years of the Republic. Life expectancy increased by twenty years from 1943 and 1960. Other tropical societies also experienced rapid improvements during this period due to innovations in treatments for tropical diseases suggesting that the disease environment could partly explain low life expectancy for Cuba early on.

Figure 1- Cuba's HDI and Consumption Ranking

1929-2017



The consumption and HDI ranking show different trajectories. Cuba's consumption ranking fell from 17th in 1955 to 46th in 1980, to 90th for 2017. The decline between 1955 and 1980 occurred despite the high levels of aid from the Soviet Union and its satellites. The Southern Cone also fell in the consumption rankings before 1980 but to a lesser extent. Argentina's ranking fell from 16th in 1955 to 41st in 1980 while Chile fell from 21th to 37 th. Given the relative decline of Cuba and the Southern Cone, Spain (22) led the Spanish speaking societies by 1980.

The Cuban HDI ranking for 1980 (49) is close to its consumption ranking (46). As it turned out, 1980 is the crossover year – relative consumption continued to fall for Cuba while the HDI did not. By 1996, Cuba had slipped to 79th in the consumption ranking - now far below the Southern Cone. The decline reflects the "special period"

and Cuba's halting recovery thereafter. Despite this, Cuba's HDI ranking *improved* to 40 in 1996 from 46 in 1980 due to increases in life expectancy and, especially, years of education which increased from 5.7 years in 1980 to 9.3 in 1996. For 2005, the Cuban consumption ranking is 78th while its HDI ranking is 48th. Cuba maintained this HDI ranking for 2011 and 2017 while its consumption rank fell to 90th. Measured by consumption, Cuba is now at the level of Bolivia or Guatemala in Latin America and Vietnam or Pakistan in Asia. For 2017, Cuba had a life expectancy of 79 and average years of education of 12, far above Vietnam or Pakistan. For this year, Cuba ranks 32nd for education and life expectancy out of a sample of 140 countries - compared its consumption ranking of 90.

To sum up, Cuba's reversal of fortune occurs after the revolution. On the other hand, Cuba has fallen less in the HDI rankings than for consumption. The combination of low material living standards and high life expectancy has come to be known as the "Cuban health paradox". Lindert (2010) points to the related anomaly of low Cuban income and high years of education.

How exceptional is revolutionary Cuba? As it turns out, large differences, both positive and negative, between the HDI and consumption rankings are unusual but they are not unique. The largest negative difference in the rankings for 2017 is for oil rich Equatorial Guinea – a difference of - 49 with high consumption accompanied by low education and life expectancy. There are also large negative ranking differences for Middle Eastern countries such as Egypt (-31) and Saudi Arabia (-23). Among developed countries Portugal has a -18 difference due to its education deficit.

Cuba has the largest positive difference between HDI and consumption ranking. Note, however, that five of the six countries with the largest positive differences were planned economies. In addition to Cuba, there is Uzbekistan, Zambia Georgia, Tajikistan, Kirgizstan. Zambia is the only economy without a history of central planning. I will return Cuban exceptionalism later.

We gain further insight into Cuba's reversal of fortune by comparing revolutionary Cuba to Eastern Europe – at the birth of the revolution these planned economies were mostly at somewhat lower income levels but were comparable in most other respects. In particular, they had stable regimes, supported by the red army, that most observers expected to be permanent. These are the classic conditions for Olsen's (1993, 1995) stationary bandit giving the communist elites of Eastern Europe the incentives to stimulate growth and to improve education and healthcare given that they could expect to reap the rewards. Olson (1993, 1995) further argued that communist elites generated their growth primarily through intensive capital accumulation. This is what occurred after 1950 in Eastern Europe and the Soviet Union. By the mid-1960's, the Cuban revolutionary elites had developed formidable institutions of state control and to most observers the revolution seemed permanent. Yet, unlike Eastern Europe, this did not lead to growth. In other words, the Cuban elites did not behave like stationary bandits, at least where growth is concerned.

5. Growth in an Eastern European Mirror

The planned economies of Eastern Europe and the Soviet Union grew at impressive rates before the 1980's largely through factor accumulation. While economic historians agree that growth for Eastern Europe was below Western Europe, see Maddison (1998), their growth rates were above Latin America and most of the developing world.[20] Among the planned economies, revolutionary Cuba is the exception to this statement as it grew at a slower rate than Eastern Europe and other planned economies. To show this, Figure 2 compares GDP per capita from 1960 to 1989 for the planned economies of Eastern Europe (Albania, Bulgaria, Czechoslovakia, Poland, Romania and Yugoslavia aggregated with PPP weights) to Cuba. The data for Eastern Europe are from the 2013 release of Maddison project while Cuba is from Devereux (2020). To allow comparison, I set 1960 equal to 100.

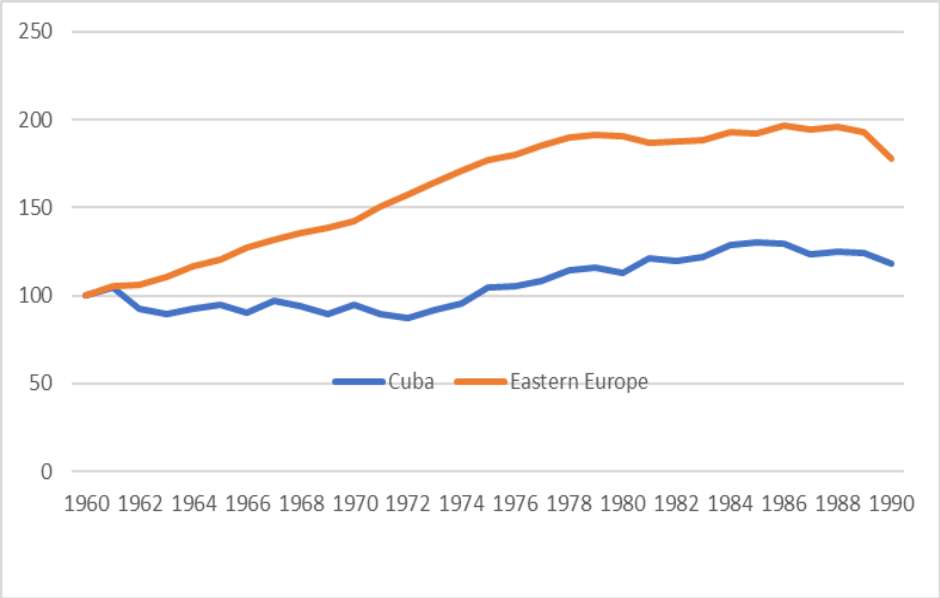
After the revolution, Cuban growth is anemic. Income fell initially and it did not reach its 1960 level again until the mid-1970's. There is some growth from the mid 1970's but this was ended by the political upheavals of the mid 1980's. To put this in perspective, income per capita for Eastern Europe doubled from 1960 to 1990 while Cuba's income increased by only 25 percent. Cuba underperformed the Soviet Union by a similar margin.[21]

[20] Allen (2003) provides an even more optimistic perspective on the Soviet growth.

[21] There are, to be sure, difficulties with the national income accounts for planned economies. Despite this, there is a consensus among economic historians that the GDP estimates for Eastern Europe and the Soviet Union are reliable enough to allow comparisons over the long run see Maddison (1998) or Vonyó (2017.

Figure 2

GDP per capita for Cuba and Eastern Europe, 1960 to 1989



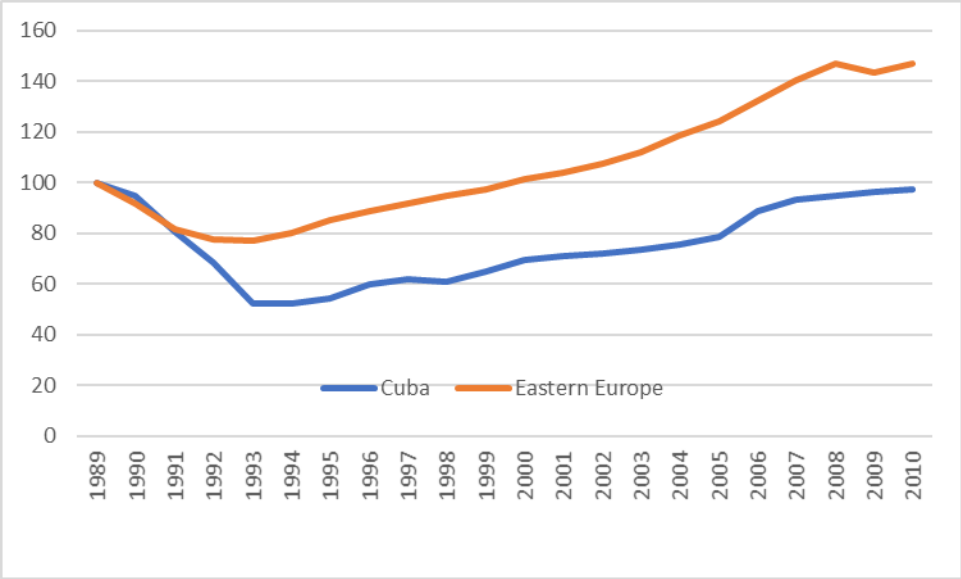
Olsen (1995) argued that growth in communist economies occurred largely through capital accumulation. Did Cuba under-invest in capital accumulation relative to Eastern Europe and the Soviet Union? Unfortunately, the Cuban national accounts begin in 1985 so this cannot be answer definitely. The isolated information that we have before 1985 suggests that Cuban capital accumulation was low by the standards of other planned economies.

The economy worsened after the fall of communism. To show this, Figure 3 tracks GDP per capita for Cuba and Eastern Europe from 1989 to 2010. The demise of communism devastated Cuba. The fall in Cuban income is greater and the recovery is slower than for Eastern Europe. Indeed, Eastern Europe recovered its 1989 income levels by 1999 whereas Cuba recovered them ten years later. By then, income per

capita in Eastern Europe was 40 per cent above its 1989 level. The Cuban economy during this period is characterized by extraordinary low rates of capital accumulation.

Figure 3

GDP per capita from 1989 to 2010



Of course, the comparison is strained since Eastern Europe had abandoned central planning by the early 1990's. It is unfair to Cuba as Eastern Europe had assistance from the European Community and the World Bank and it had access to the world capital markets while Cuba did not. The comparison with Eastern Europe does, however, illustrate the central characteristic of the revolutionary economy –slow growth before 1989 followed by a very large drop in Cuban output and with a sluggish recovery. Cuba now finds itself on the brink of yet another absolute decline suggesting that its downward drift in the world income distribution will continue.

What explains this dismal performance over six decades? The U.S embargo matters, at least early on, but this was compensated for by massive aid from the Soviet

Union. The chaotic economic policy of the first decade of the revolution, described by Mesa Lago (1982, 2000), is also part of the explanation. Yet, there is more to Cuba's malaise as the move to orthodox planning in the 1970's did not spark growth. Nor did the later aid from Venezuela. Nor have the sporadic, half-hearted and often reversed reforms over the last three decades made much of a difference. Put differently, despite being in absolute control for sixty years, the ruling elites of revolutionary Cuba have not acted as a stationary bandit in that they have not adopted the policies that are required to raise investment or to increase living standards. This is where the comparison with Eastern Europe is informative as under communism the ruling elites of Eastern Europe, despite the manifest failings of planned economies, generated significant economic growth through capital accumulation. Cuba did not take this road as Cuba also seems to have slow rates of physical capital accumulation during the planned era.

On the other hand, the Cuba elites have invested heavily in education and healthcare. We see this clearly in the comparisons with Eastern Europe.

Education

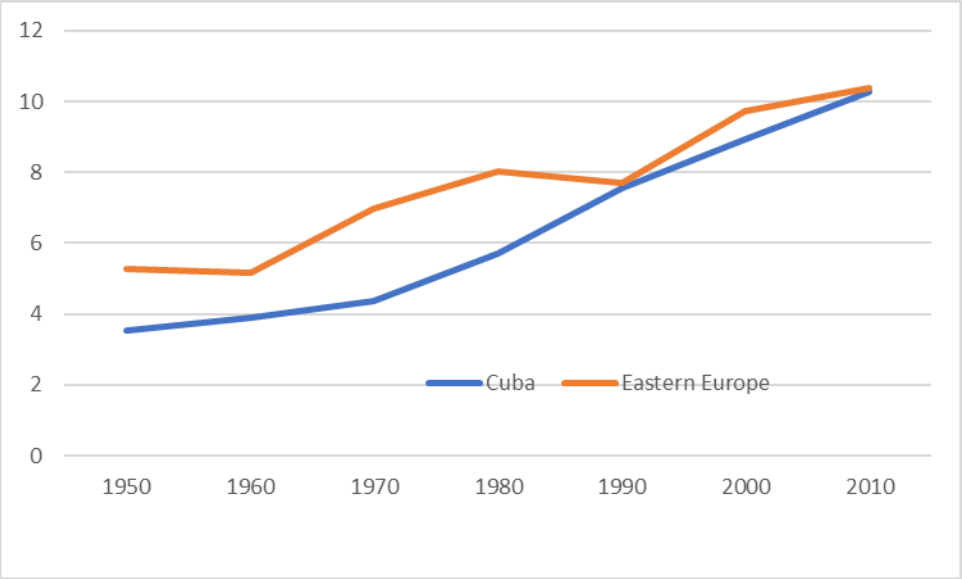
Figure 4 compares Cuban years of education from 1950 to 2010 from Lee and Lee (2016) and Barro and Lee (2013) with a population weighted measure of years of education for Eastern Europe.[22] Eastern Europe starts off with higher education. After a slow start, Cuba catches up by 1990. Since then, Cuba has kept pace. The Cuban

[22] I have no data for Yugoslavia and Albania. But this is unlikely to change the results.

performance is remarkable given that Eastern European incomes are now four or five times higher than Cuba.

Figure 4

Comparing average Years of Education 1950-2010



Do the education results imply, as is often claimed, Cuban exceptionalism? As it turns out, they do not. To see why, Table 4 looks at the other countries with large positive divergences in consumption and HDI rankings for 2017 mentioned earlier (I exclude Zambia). All the economies in Table 4 are poor. They all have a background of central planning. Three of the four economies have lower consumption levels than Cuba but all have similar years of education. Thus, Cuban education is not as unique as is often supposed and other planned economies have invested in education.

Table 4

Countries for 2017 with Large Positive Differences in HDI Rankings

country	Life Expectancy	Years of Education	Consumption rank	HDI rank	Difference in HDI /Consumption Rank
Cuba	78.7	11.8	90	51	39
Uzbekistan	71.4	11.7	98	69	29
Georgia	73.4	12.8	65	41	24
Tajikistan	70.6	10.6	108	85	23
Kyrgyzstan	71.2	10.9	91	71	20

Where Cuba stands out in Table 4 is life expectancy.

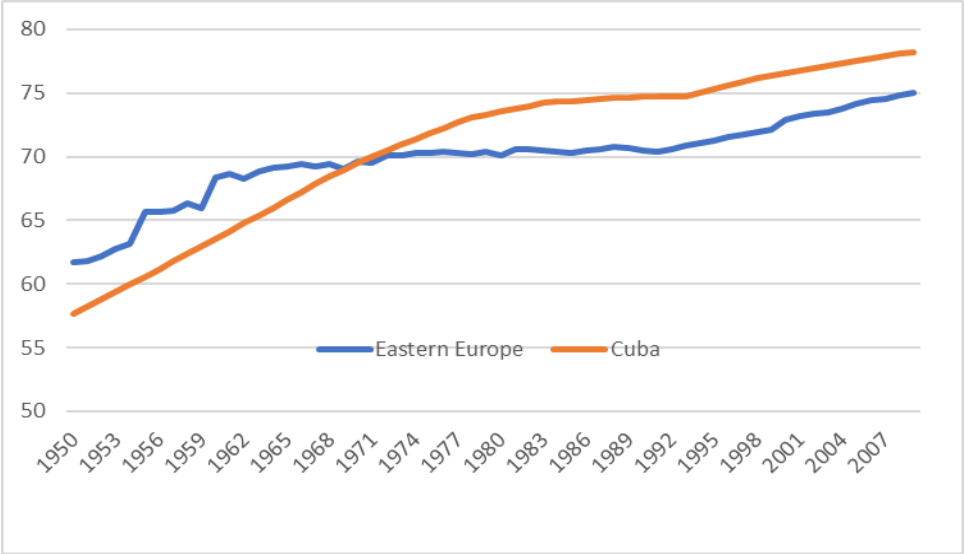
Life Expectancy

Figure 5 compares life expectancy for Cuba with that for Eastern Europe aggregated by population. Early on, Cuba lagged Eastern Europe in life expectancy. The gap was four years in 1955. By 2010, the gap was four years but in favor of Cuba.

There are, to be sure, measurement issues which inflate Cuban life expectancy. In particular, the pressure on Cuban doctors to reduce infant mortality has likely led to a misclassification of infants deaths, see Gonzalez (2015) and Gonzalez and Gilleskie (2017). Other policies may have artificially reduced infant mortality too, see Berdine, Geloso and Powell (2018a, 2018b). Be that as it may, no other poor economy has close to Cuban life expectancy even allowing for some overstatement.

Figure 5

Comparing Life Expectancy



There are two caveats. First, while Cuban life expectancy is impressive, this does not mean that Cuban healthcare compares favorably in other respects to wealthy countries as everything we know about Cuba suggests that that it does not. Consider, for example, the shortages of elementary medicines and the generally dilapidated state of healthcare facilities. Second, it should also be borne in mind that the achievements of the Cuban system arise from unique Cuban circumstances and in particular from Cuba's powerful institutions of state control. Nonetheless Cuba has, and this should be emphasized, given its poor and its disadvantaged access to basic healthcare.

6. Concluding Comments

Over the very long run Cuba provides a remarkable example of a reversal of fortune since it has gone from a middle income economy in 1910 to a poor one now with most of the relative decline occurring after the revolution. There are two paradoxes associated with Cuba's reversal of fortune. The paradox of the Republic is that it underprovided education and perhaps healthcare relative to its income. The paradox of the revolution is that it overprovided education and healthcare relative to its income.

There are many questions to be answered. For the Republic, the issue is why did political elites neglect education and, perhaps, healthcare? The Cuban franchise expanded as the century progressed changing policy in many areas. There is, for example, the increasing regulation of sugar and the industrial sector, the pro-labor legislation of the 1940's and so on. Why then do we see failures for education? For the revolutionary era, the question is why did the revolutionary elites invest in education and healthcare while at the same time failing on the economy in a world where other planned economies grew at fairly high rates?

The answers to these questions must lie in the behavior of the Cuban political elites. By the 1940's Republican Cuba had a reasonably open political system with a strongly liberal constitution. Since then Cuba has moved in the opposite direction, first with the Batista dictatorship and then with institutionalized repression over the six decades of revolutionary rule. The HDI does not consider democracy or human rights. If it did it, this would reinforce the claim that Cubans have experienced a tragic reversal

of fortune over the last century with no end in sight. In sum, the revolutionary elites have controlled Cuban society for six decades. They have invested in people but not in the economy or in participatory democracy. This is the ultimate revolutionary paradox – revolutionary Cuba is the stationary bandit that did not provide growth.

Data Appendix

The appendix discusses the sources for consumption benchmarks.

The sources Tables 1 to 3 are:

1910. Ireland is from Devereux (2021a) while the other countries are from Ward and Devereux (2021). All comparisons are Fisher Ideal estimates with a U.S base except Ireland which is a bilateral British/Irish comparison for 1907 that is assumed to hold for 1910.

1929. All estimates are from Devereux (2021b). The comparisons use data on expenditures and prices provided by Clark (1951) with additional data on quantities and updated data on nominal consumption. The indices are Fisher Ideal indices with a U.S base. The Southern Cone estimates are from 1934 benchmarks projected to 1929 using GDP from the Maddison project.

1955. The consumption estimates are from Gilbert and Kravis (1954, 1958) for the U.S and Western Europe, Dewhurst et al. (1961) for the smaller European economies, Braithwaite (1967) for Latin America and the CIA (CIA (1963)) for Eastern Europe. The CIA estimates are little known as they were classified and released after the end of the Cold War. They appear to be of good quality.

For individual countries:

Australia - Haig (1968). The estimates refer to 1958/1959.

Canada – Kravis (1976), average of 1960 and 1950. These refer to income. I assume the benchmark for consumption equals that for income.

Cuba – Ward and Devereux (2012) slightly updated.

Soviet Union – Bergson (1972).

1980, 1996, 2005, 2011 and 2017. The main source are the benchmark studies of the International Comparison Program (ICP). These provide actual individual consumption. The ICP overage increases over time - from 61 countries in 1980 to 140 in 2017.[23] Where observations are missing, I use consumption data from the Penn World Tables Version 10. For consumption, the PWT provides output-side real GDP at current PPPs (in mil. 2017US$) called CGDPo, it also provides the consumption share in CGDPo. Using these series, I obtain the levels of consumption implied. The PWT data appear to be household consumption rather than actual individual consumption. I adjust the PWT estimates to actual individual consumption using the ratio of actual household consumption to consumption in the 2011 round of the ICP. I have not been able to adjust for the fact that the PWT compares consumption etc. using Geary Khamis measures whereas the ICP numbers use a multilateral generalization of the Fisher Ideal called the Éltetö-Köves-Szulc (EKS) index.

[23] The 1985 ICP round is flawed in some important respect and is omitted.

In addition, I exclude small states with population less than one million. I also exclude Petro-states as their PWT numbers are subject to particularly large margins of error. Finally, I adjust some individual countries, particularly for 1980.

Cuba. The ICP collected Cuban data for the 2005 round but no estimates were provided due to methodological problems with the Cuban national accounts. Cuba is also absent from recent versions of the Penn World Tables. Ward and Devereux (2012) provide a Cuba/U.S comparison for 1953. They also provide a rough Cuba/Costa Rico comparison for 2000 using price data collected by the United Nations.

1980. I project the 1953 Cuba/U.S benchmark to 1980 using U.S consumption from the national accounts and the Cuban consumption series from Devereux (2020).

1996, 2005, 2011. I project the consumption benchmark for 2000 from Ward and Devereux to 1996 and 2011 using the consumption series from Locay and Roberts (2012). I assume that their 2008 estimate holds for 2011. For 2017, I assume that relative Cuba/U.S consumption equals the estimate of relative Cuba/U.S income from the U.N HDI data set. While the Cuban consumption estimates leave a lot to be desired, the errors likely work, however, to understate Cuban living standards.

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