ORIGINAL ARTICLE

Does socialism really lead to economic failure? The USSR and COMECON Eastern Europe before 1989

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Abstract

The introduction of the market system in the COMECON countries of Europe after the end of communist rule is examined for the USSR and five Eastern European countries. The market system only led to improvements in economic performance relative to Western Europe in two out of six countries compared in 1988 and 2016. New figures from the Maddison Project Database are used to illustrate this. Quality of output problems in COMECON countries has probably been exaggerated. Evidence undermines claims that socialism leads to high investment for a low return in terms of economic growth. Investment may have been lower than official figures indicate. Economic growth may have been higher. Socialist countries that want higher growth than capitalist countries should invest more. Socialist societies can be established without necessarily sacrificing economic performance.

1 | INTRODUCTION

Did the market system lead to higher national incomes for the former communist countries of Eastern Europe relative to Western Europe after 1989? Our goal here is to compare the GDP per capita of six countries: the USSR, Bulgaria, Czechoslovakia, Hungary, Poland, and Romania with Western Europe. The comparison years are 1988 and 2016. 1988 is chosen because

comparing 2016 with 1989, a year of regime change in five of the six countries, would be distorting. The Maddison Project Database (MPD 2018) provides the GDP per capita figures (Bolt et al., 2018). The six countries were members of the Committee for Mutual Economic Assistance (COMECON). This was an economic coordinating body for countries allied to the USSR. The six countries are the European COMECON countries, excluding the German Democratic Republic (GDR) as MPD 2018 does not provide figures for it. They will be referred to as the "COMECON countries" for ease of reference although COMECON included some non-European countries.

Evaluating non-COMECON Yugoslavia and Albania (that ended COMECON participation in 1961) would mean considering country-specific issues. Yugoslavia had a system of workers' self-management. Albania was very isolated internationally. Hungary did have a more market-orientated system than the other COMECON countries, but this was only a partial system of market socialism due to the continuing influence of the center over economic decision-making (Kornai, 1986).

If the private enterprise system is superior, then relative performance should have improved after 27 years (or 25 in the case of the USSR). The conclusion is that only two of these six COMECON countries were significantly better off relative to Western Europe in 2016 compared to 1988 and that this is evidence that the private enterprise system is not economically superior to socialism. Higher Western European national incomes might be due to historical or other factors.

MPD 2018 gives historical GDP per capita figures for countries at purchasing power parity (PPP) up to 2016. According to the OECD:

> "Purchasing power parities (PPPs) are the rates of currency conversion that try to equalise the purchasing power of different currencies by eliminating the differences in price levels between countries." (OECD, 2018)

This article will use terms such as communist era or postcommunist era. These phrases only indicate rule by communist parties or parties claiming to be socialist or communist in Eastern Europe up to 1989 and the USSR up to 1991. They do not imply a judgment on whether these countries were actually socialist or communist at this time.

However, this article does intend to assess the potential performance of socialism. The premise is that state ownership is the basis of socialism. If the state-owned economies of COMECON were relatively successful, then this also bolsters the case of those who want "real socialism" on some other basis, for example, democratic socialists or left critics of some or all of the Soviet era.

Earlier versions of the Maddison database created a negative view of the record of the COMECON countries. The last version incorporating all data (including GDP and population) is the Maddison Project Database version 2010 (MPD, 2010). Angus Maddison developed a database for the world economy which eventually gave national GDP, per capita GDP and population figures from 1 AD to 2008, although it first appeared in the 1990s (Maddison, 1995). It gave GDP per capita values for the USSR and Eastern Europe that were very low compared to Western Europe. According to the database, GDP per capita of the USSR in 1988 was 46% of the average figure for Western Europe. The figure for Hungary was also 46%, Czechoslovakia was 57% (see Table 1).

TABLE 1   Per capita GDP Maddison database 2010 and *RGDPnapc*

Country	GDP per capita % of 16 Western Europe Nations MPD 2010			*RGDPnapc* % of Western Europe MPD 2018	
	1988	**1990**	**2000**	**1990**	**2000**
Albania	16%	16%	14%	15%	15%
Bulgaria	41%	35%	28%	34%	25%
Czechoslovakia	57%	53%	46%	55%	48%
Hungary	46%	41%	37%	54%	47%
Poland	38%	32%	38%	34%	40%
Romania	27%	22%	16%	38%	29%
Russia	—	49%	28%	69%	39%
USSR	46%	43%	23%	51%	27%

Data Source: MPD 2010 and Bolt et al., 2018. *RGDPnapc* is a measure of GDP per capita (see below). GDP per capita for 16 Western European nations calculated by author from GDP and population data in MPD 2010. MPD 2018's "Western Europe" figure includes Iceland, Luxembourg, Malta, and Cyprus which are not included in MPD 2010. Their population represents only 0.44% of MPD 2018 Western Europe total in 1990.

Even partly sympathetic historians like R. C. Allen drew negative verdicts about the economic performance of the USSR from the early 1970s on based on Maddison's figures (Allen, 2003, p. 194).

MPD 2018 is calculated with a different method that its authors present as an improvement (Bolt et al., 2018). COMECON performance now looks better. For example, the 1988 figure for Czechoslovakia in MPD 2018 is 78% of the Western European total and Hungary is 56%. If the USSR figure is based on adding together the results for the 15 Soviet republics, it is 64% (see Appendix A).

It is commonly argued that the COMECON countries were inefficient as high rates of investment are believed to have led to low rates of growth, especially in the final years. However, new research exposes the contradictions of this verdict about Eastern Europe. Also, the high rate of investment in the USSR appears to have been partly, at least, an illusion, as hidden defense spending seems to have been included in the investment figures.

Section 2 of this article will examine the original MPD 2010 figures for the GDP per capita of COMECON Eastern Europe. It will argue that they are contradicted by later figures calculated by the same method but with a different benchmark year and have implausible implications. Section 3 will present the MPD 2018 figures for the COMECON countries. Section 4 will illustrate how four out of six COMECON countries were comparatively better off or in the same position in relation to Western Europe in 1988 compared to 2016. Section 5 will briefly examine the case of the GDR. Section 6 will explain why the MPD 2018 COMECON figures are reliable. Traditional criticisms of the overreporting of output value and quality in socialist countries will be examined. Section 7 will examine the economic growth figures for the last years of the COMECON countries calculated by western sources, and consider whether they are underestimates. Section 8 will discuss the criticism that a high rate of investment yields a poor return in output terms in socialist countries. If the COMECON countries were failing to catch up with the countries of Western Europe, it is likely that poor investment was to blame, contradicting the established view.

2 | THE MADDISON 2010 DATABASE FIGURES

Maddison calculated national income figures for each country in dollars at PPP for one base year, 1990. He then calculated GDP figures for all other years with GDP growth figures extrapolated forwards and backwards.

Maddison's figures are difficult to fit in with the latest figures calculated from a 2011 benchmark year. Extrapolating from 1990 leads to implausible results. To understand the problem, it is necessary to see how different sets of GDP figures using the PPP approach are calculated for different benchmark years. PPP conversion ratios are calculated by the World Bank coordinated International Comparison Project (ICP), Eurostat, and the OECD. Up to 1996 the European Comparison Project (ECP), which was under the United Nations Economic Commission for Europe, also made comparisons. The comparison ratios are calculated for benchmark years such as 1975, 1980, 1985, 1996, 2005, and 2011 (ICP, 2019).

The conversion ratios are used to convert national currency prices of products and services into international prices in dollars. It is well known that even taking into account exchange rates many goods and services are cheaper in some countries than others. A westerner who travels to a developing country will often find their money going further if they go shopping or go to restaurants than it would in their home country. PPP conversion ratios should eliminate the effects of different levels of prices between countries for goods and services so output between nations can be compared without distortion. These ratios can then be used to calculate GDP figures at PPP for each country. PPP ratios are applied to the GDP figures in national prices, with GDP broken down by category of expenditure. Each country participating in the program supplies price and output information from its national accounts to facilitate the program.

The 1990 round of comparisons did not involve the ICP, who only resumed comparisons in 1993, although their partner organizations the ECP and the OECD did make comparisons for 30 countries in 1990. Maddison creates his own 1990 benchmark values by using the ECP and OECD figures for that year but also by calculating some benchmark values by updating from earlier benchmark years when the ICP was involved, or by using figures from Penn World Tables or proxies (Maddison, 2006, pp. 171–172).

Maddison's 1990 PPP national income figures for five of the six COMECON countries are derived from the survey by the ECP (Maddison, 2006, p. 190). His figure for Bulgaria was calculated from Penn World Tables (Maddison, 2006, p. 610).

Table 1 gives the MPD 2010 figures for the East European COMECON countries, Russia, the USSR, and Albania in comparison to Western Europe. They are cross-checked with new figures from MPD 2018, the *RGDPnapc* figures to see if these figures confirm or contradict the MPD 2010 figures. This *RGDPnapc* figure is calculated by the same method as the MPD 2010 figure, but with a 2011 benchmark, not a 1990 benchmark. Therefore, with *RGDPnapc*, a 2011 GDP benchmark is calculated for all countries at PPP and GDP growth rates are used to calculate the values for all other years.

The figures are compared for 2000 as this is roughly the midpoint between 1990 and 2011. Using 2000 should give a reasonable basis for comparing the figures. According to the Maddison Project, when a GDP figure is extrapolated from its base year, it will get less accurate, especially over a long period (Bolt et al., 2018). The Maddison Project now states that *RGDPnapc* is not suitable for cross-country comparisons at all for this reason and MPD 2018 uses the new measure of *CGDPpc* to make cross-country comparisons instead. The

RGDPnapc figure, based on the GDP growth figure, is seen as best for comparing the economic growth of the same country over time. Thus, *RGDPnapc* is compared to MPD 2010 here for the midpoint year 2000 only to show that the 1990 MPD 2010 benchmark is problematic in itself. This shows that the problems with the 1990 benchmark compared to the 2011 benchmark do not just happen because the 1990 benchmark is extrapolated too far into the future.

Albania is included here because it illustrates the potential problem with Romania. Russia is included here as well as the USSR as Maddison's figures show an income equality between Russia and the other Soviet republics that MPD 2018 does not reflect. By contrast, MPD 2018 boosts Russian GDP per capita and in so doing boosts Soviet GDP.

Maddison's 2010 figures look unrealistic compared to *RGDPnapc*. In the year 2000, Albania has virtually the same per capita income as Romania according to MPD 2010, not half as the *RGDPnapc* figures show. It is hard to believe that Maddison 2010 is right and MPD 2018 is wrong here. The only reasonable explanation is that MPD 2010 underestimates Romanian GDP in 1990.

Importantly for the Soviet Union, the figure for Russia is very low in MPD 2010. This is important as when we try to construct a realistic picture of Soviet national income from *CGDPpc*, Russian *CGDPpc* is crucial due to the disproportionate size of its population and GDP per capita in the USSR. Maddison's 1990 figure for Russia is not compatible with later national income and PPP calculations and is probably in error. When the MPD 2010 GDP per capita figures are projected forward to 2016 in the MPD 2018, 1990 $ version (Bolt et al. 2018), Russia's GDP per capita is only 28% of the United States'. Russia's *RGDPnapc* is 45% of the United States' in 2016. This is roughly equivalent to the PPP estimate in the CIA factbook where Russia has a PPP GDP per capita income that is 47% of the United States' in 2016. The MPD 2010 figure for Russia would, of course, have major consequences for modern geopolitics if it was true, but the likelihood is that it is not. Of course, 2016 is a long way from the original 1990 benchmark but the disparity between MPD 2010 and MPD 2018 in both 1990 and our midpoint comparison year of 2000 shows that the problem probably starts with an undervaluation of Russian income in 1990.

Hungary is also undervalued by MPD 2010 compared to MPD 2018 when we look at the 2000 midpoint comparison.

We should consider Czechoslovakia here to establish that its GDP per capita must be higher than that of the Soviet Union in any new calculation. Even though the midpoint comparison shows little difference, we cannot imagine a significant increase in Russian and Soviet figures without an increase in Czechoslovakia's GDP per capita too. GDP per capita under communism in Czechoslovakia was somewhat higher than that of the Soviet Union. Czechoslovakia along with the GDR was usually acknowledged to have the highest living standards among the COMECON countries. An estimate for 1985 based on the Penn World Tables indicated that per capita GDP in Czechoslovakia was 1.18 times that of the Soviet Union (Summers & Heston, 1988, p. 22).

The MPD 2010 figures for COMECON countries do not correlate with *RGDPnapc*. Maddison's 1990 benchmark leads to implausible results for some countries. However, we cannot just substitute *RGDPnapc* figures and use them to calculate the GDP values for 1990. Extrapolating all the way back from 2011 like this is likely to lead to error, as we have seen. Thus, it is reasonable to investigate whether *CGDPpc* is a better alternative measure of the GDP per capita in the COMECON countries.

In conclusion, there is a prima facie case, therefore, that the 1990 MPD 2010 benchmark is unrealistic for the COMECON countries and it is correct to try and find better figures.

3 | THE NEW FIGURES-MADDISON DATABASE 2018

The new figures of the Maddison Project supersede the earlier versions of the Maddison Database. MPD 2018 has a very different method to MPD 2010. It uses different benchmark years to calculate GDP per capita but the 1990 benchmark year is not used.

In MPD 2010, the 1990 benchmark year is calculated at PPP, but no PPP adjustment is made to the GDP growth rate figure when calculating the GDP for other years. The further this index gets from the base year, the less it reflects actual international PPP as the relative prices of goods between countries will change over time. The national income series for different countries will no longer relate to each other as well.

This means there could be a difference between the new figure for a given benchmark year and the figure for the same year that is calculated by extrapolating to it from a previous benchmark year (Bolt et al., 2018). For example, there may be one GDP figure for 2011 that can be calculated by extrapolation from 2005. But when a new benchmark is estimated for 2011, using new data on international prices for that year, it is different from the figure that was calculated by extrapolating from 2005.

MPD 2018's new *CGDPpc* figures are meant to solve such problems. *CGDPpc* is a real GDP per capita figure calculated in a different way. It is calculated on a multibenchmark basis rather than just extrapolating from one benchmark year. It is intended for use in cross-country comparisons in a single year.

The *CGDPpc* figures incorporate the different PPP values for each benchmark year, not just one base year. So instead of extrapolating from 1990 to calculate the GDP per capita for 1985, 1996, 2005, and 2011 with GDP growth rates, the different PPP ratios for these years are all used in the new database. The *CGDPpc* figures incorporate changing relative prices of goods between countries as the *CGDPpc* series passes over different benchmark years in which new PPP ratios are calculated.

PPP price information is then used to calculate the *CGDPpc* figures for the years between the benchmarks. The MPD interpolates between the PPP price indices of the benchmark years, adjusting for inflation in the country concerned, to calculate the prices and hence real GDP for each of the other years. Growth in the quantity of output in national prices is, therefore, adjusted for PPP to arrive at a PPP national income figure for each year.

Sometimes interpolation is not possible because of no previous benchmarks. For example, the only benchmark for 12 of the Soviet Republics is 1996, with none before. Here, the GDP growth rate is extrapolated backwards to calculate national incomes for the years before 1996. In principle, the amount of growth in each year is adjusted for PPP (Bolt et al., 2018). PPP adjustments to economic growth figures do not always appear to be made for the communist era though. For example, the growth figures for the Soviet Repubics are actually CIA figures not PPP adjusted figures (see Appendix B).

The MPD 2018 figures give us a fresh look at the per capita GDP levels of the COMECON countries without the 1990 benchmark. The nearest benchmarks are from 1985 or 1996 (1999 in the case of the Baltic States and Bulgaria) and interpolations or extrapolations from these benchmark years can provide us with new GDP figures for the last years of the communist era. They show that Maddison's low estimates for the COMECON nations in 1988 are not corroborated by figures extrapolated or interpolated from other benchmark years.

TABLE 2 *CGDPpc* figures MPD 2018

Country	1988 CGDPpc	1988 Percentage of W. European CGDPpc	2016 CGDPpc	2016 Percentage of W. European CGDPpc
Bulgaria	11,344	51%	17,953	44%
Czechoslovakia	17,361	78%	30,118	75%
Hungary	12,486	56%	24,047	60%
Poland	8,187	37%	26,002	64%
Romania	7,223	32%	20,549[a]	51%[a]
USSR	14,367	64%	17,903	44%
Western Europe	22,318		40,364	

Data Source: Bolt et al., 2018, authors own calculations. The USSR figure is the author's calculation. *CGDPpc* values for the 15 Soviet republics are multiplied by their population and then added. It is not the "former USSR" figure from the MPD 2018 database, see Appendix A. See Appendix A for details on the calculation of national income for each country.

[a]The 2015 *CGDPpc* is given for Romania because of an error on the MPD 2018 database with the 2016 figure.

3.1 | New GDP per capita values for the COMECON countries

Table 2 gives *CGDPpc* values for the COMECON countries for 1988 and 2016 from MPD 2018 as a percentage of the West European *CGDPpc* that is from the MPD 2018 regional database.

The 1988 figures give an uplift from MPD 2010 for all the COMECON countries in relation to Western Europe except Poland. The *CGDPpc* for Czechoslovakia should be noted. As we saw, this figure should be above the Soviet *CGDPpc*. The Soviet figure is 64% of the West European level, and the *CGDPpc* for Czechoslovakia is about 21% above the Soviet figure. The *CGDPpc* for Romania is low but more realistic than before.

4 | WHAT THE NEW FIGURES SHOW

In the 1990s, economic dislocation in the former COMECON countries could be blamed on the legacy of communism. However, by 2016, 27 years after the fall of the Berlin Wall, it would be hard to argue that the legacy of communism would have stopped these countries improving their relative position with Western Europe.

The figures in Table 2 do not show the superiority of a system based on private ownership. Western Europe is obviously the nearest comparator and the former COMECON countries largely adopted the Western European system of the market and private ownership after 1989 or 1991 in the case of the USSR. Relative performance with Western Europe is the most relevant test for assessing the performance of the East European countries and the USSR under two systems.

In two out of six COMECON countries, the USSR and Bulgaria, the state-owned system performed better than the market system, comparing 1988 to 2016. In another two out of six, Czechoslovakia and Hungary, the state-owned system performed at roughly the same level. In only two countries, Poland and Romania, we can see that the state-owned system did worse than the private ownership market system.

Poland had persistent economic problems leading to outbreaks of worker's unrest. Tittenbrun argues (Tittenbrun, 1993) that such was the level of Polish debt to international capitalist lenders by the 1980s, that western capital exploited the Polish workers as a whole. The transfer of value to the west this entailed prevented the growth and development of the Polish economy taking place.

Romania also struggled with a massive international debt to western lenders in the 1980s. As in Poland, the burden was made much worse by the hike in global interest rates from the late 1970s. In the 1980s Ceausescu, the leader of Romania, responded in a radically different way to the Polish government. He appeared to be trying to pay off all of Romania's debts as rapidly as possible to end his entanglement with the western financial system (Crowther, 1988). Given the need to use exports to pay back international debt, the standard of living is likely to have lagged behind production. The Penn World Tables (Feenstra et al., 2015) indicate that exports were far higher than imports for most of the 1980s.

5 | THE GERMAN DEMOCRATIC REPUBLIC

The Maddison Database does not offer separate figures for the GDR. Angus Maddison gives some indication that the GDR's GDP per capita was likely to be about the same as Czechoslovakia's, given its level of development (Maddison, 1995, p. 133). Clearly, the GDR's GDP per capita was below the GDP per capita of West Germany.

Part of the reason why lies in the division of Germany. Intuitively it would seem that as the larger entity, West Germany naturally suffered less as a result of the split. Ritschl and Vonyo confirm this, for the early years at least (Ritschal & Vonyo, 2014). GDR companies were cut off from their primary source of raw materials and their main market. West Germany also had a vast advantage in terms of raw materials, coal and metal mining, and in heavy industries like iron and steel production.

The government of the GDR did not seem to do enough to help their country get over this poor start. Investment appeared to be a problem. There is evidence that the GDR invested a smaller proportion of its GDP than West Germany until 1970 (Sleifer, 2006, p. 57).

A comparison of the GDR before 1989 with the eastern states of united Germany after 1989 is probably going to mislead. There is no free market GDR, split away from the rest of Germany, to compare to COMECON GDR.

In 2016, per capita GDP in the former GDR states was only 73% of the average of West Germany. The official line of the German government would be that East Germany had a much lower per capita income than West Germany to begin with. They claim GDR GDP per capita was about 40% of West Germany's in 1990 (Federal Government Commissioner for the New Federal States, 2017, p. 18). In the context of MPD 2018, this would imply that East German per capita GDP was well below Czechoslovakia and even Hungary, which seems unrealistic. 40% would probably be well below the comparable MPD 2010 figure for Czechoslovakia.

Given the lack of comparable statistics, judgment is reserved on how much the reunification improved the economic potential of the region.

6 | HOW RELIABLE ARE THE MPD 2018 FIGURES?

MPD 2018 benchmark year GDP figures for the COMECON countries are calculated with physical output data and PPP price ratio data. This is broadly the same method as used in MPD 2010. However, MPD 2018 makes the calculations for multiple benchmark years, not just one.

MPD 2018 uses figures for the output of all the various categories of products that make up GDP. The figures for each category were provided by the statistical agencies of the COMECON countries to the ICP. MPD 2018 also uses the PPP international price ratios for these products provided by the ICP. When combined, according to the formulas used by MPD 2018, the quantities and the price ratios are used to calculate the *CGDPpc*.

The obvious question is, how reliable are these data sources? First, we will look at the output figures in physical terms for the various categories of products. Afterward, we will look at the reliability of the price information.

6.1 | The reliability of physical output data

Maddison talks of the incentive Soviet enterprises had to exaggerate the value of their production to meet plan targets (Maddison, 1998, p. 308). However, we must distinguish between physical volume indicators of output (e.g., how many tonnes of steel, how many pairs of shoes), and value indicators (e.g., how many rubles worth of clothing, the total ruble value of industrial production). The usually accepted problem with the Soviet figures is not with the overreporting of output in physical quantity terms, but with the calculation of price series and how this affects GDP figures. Maddison specifically mentions here how he believes enterprises boosted the value of their product mix by making false claims about the qualitative characteristics of their output.

As Alec Nove points out, enterprises that overstated output in physical quantity terms would have caused problems for enterprises they were meant to supply with the fictional output. Complaints and disruption to the plan would have come to the notice of the central authorities and would probably have been addressed (Nove, 1992, p. 430). Elsewhere he also states his view that western scholars accepted the physical output data, albeit with some reservations, as opposed to other statistics like Soviet price information that was found to be very unreliable (Nove, 1989, p. 214).

R. C. Allen finds that industrial production figures in the Stalin era were not exaggerated in terms of physical quantities of individual items produced (He does, however, cite evidence of the distortion of grain production figures). Archival research discovered no hidden set of industrial statistics contradicting published statistics. Also, the production of industrial goods showed internal consistency-input and output tables showed that outputs reported as being produced in one branch would reappear as the inputs of another branch (Allen, 2003, pp. 212–213).

6.2 | The reliability of MPD 2018 price data—Product quality issues

Despite generally accepting the output figures for individual products, Allen notes, as Nove does, that western scholars tend to reject the aggregate statistics for the whole economy. These are statistics like industrial output or "Net Material Product" (NMP), the Soviet measure of national income (Allen, 2003, pp. 212–213). This, again, suggests that the price data used by the statistical agencies of the COMECON countries to calculate aggregates like NMP were unreliable.

MPD 2018, however, uses PPP prices to calculate the value of GDP, it does not simply value it at national currency prices. The ICP obtains physical product information for a sample of products in each output category. They then determine what similar products would cost in the international comparator country that they (or their partner organization) are using. The

comparator country was generally the United States but it was Austria for the COMECON countries in some years. The comparator prices allow the calculation of price ratios for the different categories of output. These price ratios convert the value of goods in national currencies into their value at PPP priced in US dollars (or Austrian currency). MPD 2018 then use this information to determine the total value of output at PPP and the *CGDPpc* in dollars.

It is not the case, therefore, that MPD 2018 used unreliable COMECON price data. The real question is how far this procedure allowed for differences in quality between COMECON goods and goods produced in international markets. Did the procedure used by the ICP really reflect the quality problems that are frequently alleged to have existed with COMECON products? For example, did the prices really reflect the quality differences between a car produced in the USSR and a car produced in Austria?

Enterprise managers in the Soviet Union, for example, could distort aggregate data about the value of production by pretending simple price increases of some items in a given product mix were actually due to increases in quality. It is believed this often took the form of exaggerating the qualitative characteristics of a "new" product (Nove, 1992, pp. 434–435). Some "new products" might not have been much different from the old products they were replacing for this reason. Thus, the aggregate value of production could be artificially boosted, even if the physical volumes had been truthfully reported. Nove did not believe this led to a huge distortion in the figures (Nove, 1980, pp. 374–375). However, the CIA thought the issue was more serious. They mainly analyzed its effect in the machinery sector, but they seemed to believe it was a general problem in the Soviet economy (CIA, 1979, p. 8).

Some writers use the perceived poor quality of Soviet goods as way of reducing GDP estimates very substantially. Igor Birman uses his own quality estimates to calculate a very low consumption figure for the USSR of 22.4% of per capita U.S. consumption in 1976 (Birman, 1989, p. 155). However, as he admits himself, (e.g., Birman, 1989, p. 77) his approach is very subjective.

Do the *CGDPpc* figures for the COMECON countries take into account quality differences, or should *CGDPpc* figures be reduced in the same way as Birman does for Soviet consumption?

First, we should look at the benchmark years. *CGDPpc* figures rely on information gathered by the ICP. The ICP generally tries to find items with similar qualitative characteristics that are available in all countries they are comparing. The ICP compares countries at different levels of development. Purely from the point of view of the relative level of development, a reasonable comparison of a country with Romania's income in 1988 and Western European countries should not be impossible using different ICP benchmarks.

It might be argued that there were issues of reliability or compatibility of data between the COMECON countries and West European countries. This should not be exaggerated. An ICP benchmark is calculated by a team working with the co-operation of the government of the country being surveyed to obtain the required price and output information from the relevant statistical agencies. Even with communist countries, the ICP used the international standard *System of National Accounts* methodology to collect output data for different types of product and service and to aggregate them into a GDP figure (UN, 1994).

ICP benchmarks are meant to calculate price ratios with the key characteristics of commodities to ensure a proper objective valuation. The ICP calculates these ratios using detailed product specifications which should give them a reasonably accurate picture of the genuine characteristics of a product. For example, in 1975, the category of eggs contained a specification detailing a specific size and even the firmness of the yolk (Kravis, Heston, & Summers, 1982, p. 38). In 1975, the ICP also asked countries for information about the maximum speed and size

of cars as well as the number of cylinders (Kravis et al., 1982, pp. 50–51). With housing the ICP asked about the year the house was built, its size, and the presence of facilities like electricity, bath, toilet, and central heating (Kravis et al., 1982, p. 55).

Let us say a Soviet car manufacturer tried to increase the price of its cars disproportionately by including some minor improvement. Even if this trick worked with the Soviet authorities, when the ICP came to value the car it would just value it with an international price that reflected how much a car with its maximum speed or number of cylinders and so on would sell for in other countries.

Second, we shall look at the calculation of national income in the non-benchmark years. Could these figures be distorted by false claims about the quality of goods and services? In the case of the COMECON countries, MPD 2018 uses western estimates of economic growth for 1950–1990. It does not use official GDP figures as the basis for calculating *CGDPpc* for the years between the benchmarks for the communist era. A ratio calculated by the CIA is used to calculate growth rates for the 15 Soviet republics for these years. Figures for Bulgaria, Czechoslovakia, Poland, and Hungary are calculated by the Research Project on National Income in East Central Europe. The growth figures used for Romania were calculated after communism by a Romanian academic (see Appendix B for the calculation of GDP growth figures in the COMECON countries).

The method of calculating growth used by the Research Project and the CIA was to calculate growth in physical output terms. This means that there will be a tendency to exclude quality from the growth rate figures. The usual practice is to deflate the GDP of different years by the price index to get a GDP growth series in constant prices. Inflation indices are not meant to reflect price changes due to improvements in quality. In theory, a constant price GDP growth series should, therefore, reflect changes in quality as reflected in price increases. The debate over how successful GDP growth series are at doing this cannot be pursued here, but problems with comprehensively reflecting quality change in GDP are not just an issue for postcommunist countries.

Using physical volume series growth rates is controversial, as we shall see, because they may underestimate economic growth in the COMECON countries. However, it should also mean that the growth figures used to calculate national income figures between the benchmarks should not be affected by distortions due to any false increases in quality.

In principle MPD 2018 *CGDPpc* should reflect quality but there is a particular issue due to the quality adjustments in the 1990 benchmark which are not included in MPD 2018. The ECP made extensive quality adjustments to the prices of goods and services in COMECON countries for the 1990 benchmark that Maddison uses for MPD 2010. However, as we have seen the 1990 benchmark is not used for MPD 2018. The nearest benchmarks to 1990 are 1985 and 1996.

The ECP makes quality adjustments for the prices of goods for the "Group 2" of former East European communist countries and the USSR (except Bulgaria that was not included in the 1990 comparison). It does not quality adjust the prices of the "Group 1" Western European market economies (ECE, 1994).

The quality adjustments for 1990 are a lot more numerous than those for the 1985 benchmark. For example, in 1985, there are 264 quality adjustments out of 864 comparisons for Hungary. In 1990, there are 453 out of 910. The Soviet Union is only included in the 1990 exercise. Six hundred one items are quality-adjusted out of 842 items compared (Franz, 1999, pp. 247–249).

As the ECP admits each quality adjustment involves a "certain element of subjective appreciation" (ECE, 1994, p. 21). This must have created the possibility of distortions.

We need to look at whether missing out on the quality adjustments of the 1990 benchmark may bias the *CGDPpc* of COMECON countries upward in MPD 2018.

A comparison of Poland and Hungary in Table 3 gives some indication that quality adjustment may not be the reason for the difference between the MPD 2010 figures and the MPD 2018 figures. Both Hungary and Poland participated in the 1985 and 1990 benchmarks. In MPD 2018, their national incomes at PPP are the result of interpolations between 1985 and 1996 benchmarks with the 1990 benchmark excluded.

Here, we see that 31% of Hungary's items were quantity-adjusted in 1985 against 50% in 1990. In the case of Poland, 42% of items were quality-adjusted in 1985 as opposed to 62% in 1990.

Both Hungary and Poland receive more quality adjustments in the 1990 benchmark. When MPD 2010 is compared to *CGDPpc*, this only leads to a lower GDP per capita for Hungary. Poland stays the same. Table 3 may mean that the lower MPD 2010 figures compared to MPD 2018 *CGDPpc* figures are not only due to quality adjustment. Therefore, COMECON nation *CGDPpc* figures that leave out the 1990 benchmark may not be underestimated due to the lack of "extra" quality adjustment. The differences may be for other reasons.

Bulgaria and Czechoslovakia also show that the quality adjustments of the ECP for 1990 may not be needed for realistic *CGDPpc* values. If 1990 is missed out, then it should still be possible to calculate an accurate series of per capita GDP figures from the other benchmarks. In particular, *CGDPpc* values extrapolated back from 1996 or 1999 should be reasonably reliable.

After 1990, GDP growth rates are the official rates provided by the new postcommunist governments. This fact can be used to confirm that the *CGDPpc* figures for 1990 are not massively distorted by false quality claims. If the 1990 *CGDPpc* value is the result of an extrapolation from 1996 or 1999 using GDP growth rates, then these growth rates should reflect the quality improvement that occurred in this time. In theory, the 1990 *CGDPpc* figure should reflect any lower quality in the communist era.

We can look at three of these countries, Bulgaria, the Czech Republic, and Slovakia. In these countries, the *CGDPpc* figures for 1990 are the result of extrapolating back with the GDP growth figures, adjusted for PPP. The extrapolations are from 1999 in the case of Bulgaria and 1996 in the case of the Czech Republic and Slovakia. After 1990, GDP growth rates for these countries are the rates released by the postcommunist governments and are no longer a physical volume series. These extrapolations should provide some indication of the relative quality of products in 1990 compared to 1996.

As the *CGDPpc* values for the Czech and Slovak republics broadly reflect the *CGDPpc* value for Czechoslovakia (see Appendix A), they should give some confirmation of the 1990 *CGDPpc* value for Czechoslovakia.

TABLE 3 Comparison of quality adjustments Hungary and Poland

	Items compared 1985	Items quality-adjusted 1985	Items compared 1990	Items quality adjusted 1990	1990 GDP % W. Europe MPD 2010	1990 *CGDPpc* % W. Europe
Hungary	864	267	910	453	41%	51%
Poland	776	328	847	529	32%	32%

Data Source: Franz (1999), pp. 247–248), MPD 2010, and Bolt et al. (2018).

This cannot be done for the Soviet Union because the figures for Russia for 1991–1994 are an index calculated from physical volumes and may not include quality improvements reflected in prices (see Appendix A). This does, of course, create the possibility that the growth decline in Russia in these years was less than the official figures indicate if it is believed there was a substantial quality improvement in Russian goods and services in these years. However, this is not certain. For example, if Russian weapons were of higher quality than Russian consumer goods, then the collapse in military production may have offset any improvements in the quality of consumer goods in this period.

Thus, the extrapolation back from 1999 or 1996 to 1990 should, in theory, give us a "quality adjusted" picture of national income in 1990 for Bulgaria and Czechoslovakia. Extrapolated back only another 2 years with western estimated growth rate figures, and we arrive at the values for 1988. This should mean that the *CGDPpc* values for 1990 or indeed 1988 should not need further quality adjustment and can stand on their own. It should be mentioned here that Zsolt Darvas (Darvas, 2015) suggests the general method of extrapolating back with growth rates from the capitalist era as a way of confirming the national incomes of communist countries.

The idea that GDP growth rates in the postcommunist era reflect quality increases has been challenged. Filer and Hanousek argue that Czech government efforts to deduct price increases due to quality improvements from inflation were inadequate in the postcommunist era. They believe that because of this, inflation is overstated by over 4% per year during the 1990s. They think that GDP growth in the Czech Republic in the 1990s was 3.6% a year in the 1990s, not the official figure of −0.7% (Filer & Hanousek, 2003, p. 375). They mainly calculate their estimate of inflation by asking focus groups how much they would pay in 2001 for a given item produced in 1990. The focus groups were asked to do this by making a comparison with how much the 2001 version of the item cost when quality had improved (Hanousek & Filer, 2004, p. 240). The idea was that the difference between the price of the focus group said they would pay for the 1990 item in 2001 and the price of the quality improved brand in 2001 represented the amount of quality improvement. Then they analyzed price indices to see how far their own "quality improvement price increases" had been deducted from the index of price inflation for the products concerned and found that the official quality adjustments were a lot smaller.

However, there is generally significant bias upward in the amount focus groups say they will pay for new products compared to actual purchasing decisions (Schmidt & Bijmolt, 2019). Filer and Hanousek did not have any way of calculating bias in their focus groups where they are asking about old brands that are no longer produced. We cannot tell from their work if in real life people would pay less, more or the same for the old brands than they stated in the focus groups. Also, not all preferences for new goods may be due to physical quality. It is true that the focus groups discussed the characteristics of the items. However, this hardly rules out the possible bias from peer pressure to buy branded, fashionable goods that is substantial in capitalism. As socialist countries put much less effort into branding and marketing, it is reasonable to believe that much of the preference for the newer goods may be for reasons other than physical quality characteristics.

Also, one of the articles the authors cite in support of their case actually undermines it. They cite an article that examined focus group evidence about consumer attitudes to charging for ATM use. This was meant to support Filer and Hanousek's premise that focus groups are a good means of determining what consumers will pay for products (Hanousek & Filer, 2004, p. 240, n. 5). But this article says:

"It cannot be stressed enough that focus group results are not conclusive. The small sample sizes and group homogeneity help in bringing about group discussions but render any generalizations of limited value."

(Samel, Henthorne, & Warren, 1993, p. 28)

Filer and Hanousek state that their focus groups were not homogenous in terms of socioeconomic group (Hanousek & Filer, 2004, p. 241, n. 7). Samel and his coauthors argue that this kind of heterogeneity actually prevents people in focus groups expressing their true feelings as conflicts between people of different backgrounds may cause controversy which will distort the results (Samel et al., 1993, p. 27). Also, Filer and Hanousek's sample size might be described as small as their 15 focus groups only amounted to 90 people in total (Hanousek & Filer, 2004, p. 241).

Overall, we can say that it is doubtful if focus groups can provide evidence for definitive statements about the economic growth of a country.

Really to assess the quality of Soviet and other COMECON goods, some objective analysis is needed, rather than subjective adjustments of one kind or another or the impressions of a single writer like Birman.

In the Soviet Union, the state laid down standard quality standards for products—"type standards" and had mechanisms to enforce them through inspections by the State Committee on Standards (Hill & McKay, 1988, pp. 10–11). Enterprises producing higher-quality items could be given a "Mark of Quality" and could indeed be allowed to charge a higher price. To achieve this, they had to appear before a Ministry "attestation committee" approved by the State Committee on Standards. Generally, products awarded a "Mark of Quality" were expected to meet world market standards. (Hill & McKay, 1988, pp. 10–13). In 1981, 15.7% of total Soviet sales turnover was from these highest category products (Hill & McKay, 1988, p. 35).

The authors found that the Soviet standards laid down for the machine tool types they studied provided "strong evidence" that Soviet standards matched U.K. standards (Hill & McKay, 1988, p. 30).

Based on reviews in the United Kingdom quoted by the authors, Soviet cars were of below-average quality but did improve over time. However, the authors found that none of them had been awarded the Mark of Quality (Hill & McKay, 1988, p. 91). This provides one piece of evidence contradicting the thesis that Soviet GDP was boosted by false quality claims. The Biryusa fridge did get a Mark of Quality award, and 63,100 were exported in 1977 out of 700,000 produced each year in the late 1970s (Hill & McKay, 1988, p. 95, 109). In the United Kingdom, it does seem to have been for the lower-income market but it appeared to be of reasonable quality. The quality standards laid down for Soviet cameras matched equivalent British standards in 75% of cases (Hill & McKay, 1988, p. 114). Cameras were found to be of "adequate" quality, on the whole, based on reviews in the western press, and suitable for the budget, beginners end of the U.K. market (Hill & McKay, 1988, pp. 123–125).

It is likely that Soviet quality was highest in the area of weapons production. The US Department of Defense used a sophisticated methodology to assess the quality and quantity of the Soviet and Warsaw Pact military. This was the Technique for Assessing Comparative Force Modernization (TACSFORM) to assess conventional weapons. This produced quantity/quality indexes of the performance of Warsaw Pact weaponry based on measurable performance characteristics, and the opinions of experts. For example, it indicated a near Soviet technological equivalence in main battle tanks. It did state that NATO had a qualitative advantage in tactical aircraft, however (Vogt, 1989, pp. 274–275). The US Department of Defense found that the

Soviet made BMP-2 infantry fighting vehicle was one of the best in the world and that Soviet made self-propelled artillery like the 2S1 and 2S3 had contributed to the end of NATO's qualitative supremacy in artillery (Department of Defense, 1989, pp. 110–111).

An objective investigation of Soviet quality standards backed up by western press reviews and analysis of products shows that outside military production, their quality did not usually match the cutting edge of western products, but they did produce goods that they could sell in countries like the United Kingdom. The assertions of authors like Birman that everything produced in the USSR was catastrophically bad are not borne out. Soviet standards were not up to western levels, but the *CGDPpc* figure given here for the Soviet Union is not at western levels either, it is 64% of the West European average.

Could it not be that Soviet quality levels more or less matched this level of GDP per capita? The ECP argued that there was a need for extra quality adjustments for the Group 2 COMECON countries because many of the goods were not competitive in Austrian markets (ECE, 1994, p. 19). Purely in terms of the 1990 benchmark, this statement is hard to assess without more data than is publicly available. But should it be taken to mean that the *CGDPpc* figures from MPD 2018 for the COMECON countries need to be significantly reduced by quality adjustment? Why do middle income communist countries like Bulgaria, Hungary, and the USSR need this to a greater extent than other middle-income countries to make their GDP figures realistic? For 1988 MPD 2018 gives a *CGDPpc* of 12,897 for Argentina which is a little above Hungary but a little below the Soviet Union. The figure is calculated from a 1996 benchmark and a historical benchmark from 1960 (Bolt et al., 2018).

Would there need to be a significant quality adjustment, to create a reasonable comparison between Argentina in 1988 and the USSR? In the 1980s, many developing world countries like Argentina were emerging from a long period of statist economic policies with protectionism and a high level of government involvement in the economy. In an overview of Latin American economic performance in the 1980s, Bifani states that the global competitiveness of Latin American industry in the 1980s was poor leading to deindustrialization in Argentina and other Latin American countries. He writes:

> "Excessive protection also marginalised industry from global levels of technological progress and quality."
>   (Bifani, 1990, p. 82)

There is no real reason for believing that the methods of MPD 2018 overstate the GDPs of the COMECON countries by ignoring quality. The PPP benchmarks used seem to be enough to measure real income correctly. A PPP price series combined with western or postcommunist calculated growth rates is likely to give us a relatively conservative view of the relative income of socialist countries, not an exaggerated one. Given the problems with the 1990 benchmark stated in Section 2, adopting MPD 2018 figures for the COMECON countries seems reasonable. MPD 2018 uses later benchmarks with more countries included in the comparisons and a different technique to MPD 2010 which the Maddison Project believes is superior (Bolt et al., 2018).

6.3 | Queues and shortages

Long queues and waiting lists led to the COMECON countries looking "inefficient" on the surface, which may lead some to question the MPD 2018 GDP figures. It might be asked how the

figures could be relatively good for most countries when there seemed to be so many shortages. Queues for goods at low, fixed prices did not necessarily mean that output was too low. If the prices had been market prices, it might have been that production remained the same, but prices were higher. There would have been price rationing rather than the goods going to those who were early or lucky enough to be at the front of the queue.

The COMECON system of fixed prices and queuing left a lot to be desired. Waiting lists for big purchases like cars could be justified but not routine queuing for everyday items. Given that market pricing goes against the values of most socialists, it might be that an electronic credit card type system that tracks the purchase of a fixed quantity of goods at low prices for a household would be better. Quantity allowances for each household would make sure that everyone had access to essential products and a reasonable quantity of luxuries. Households that wanted to go over the allowance could be charged a schedule of fixed, higher prices for the additional items. Consumers could reserve temporarily unavailable items of nonbasic items over the internet.

7 | WERE THE ECONOMIES OF THE COMECON COUNTRIES DOOMED?

7.1 | Economic growth figures

It has been the conventional wisdom that an economic crisis led to the collapse of the COMECON countries. Yet even the western estimated economic growth rates for the final years of these countries, do not indicate an impending disaster, just a disappointing lack of progress.

Table 4 gives the *RGDPnapc* growth figures for 1980–1988. As stated, these are based on recalculations of per capita GDP growth in Eastern Europe and the USSR which are generally lower than official statistics (see Appendix B).

Kornai provides figures for GDP growth in the COMECON countries converted from official Net Material Product (NMP) figures without taking into account the alleged distortions that western figures are meant to eliminate (NMP figures exclude some things that GDP or GNP figures include such as many services and are therefore not comparable to GDP or GNP figures without adjustment). The figures are not adjusted for population, but it can still be seen that they would indicate a higher GDP growth per capita than Western estimates. For Bulgaria and the USSR, they indicate growth that is a lot higher. In Bulgaria's case, GDP growth is 3.4% in

Country	*RGDPnapc* growth
Bulgaria	0.59%
Czechoslovakia	1.09%
Hungary	1.36%
Poland	0.11%
Romania	1.82%
USSR	1.14%
Western Europe	1.93%

TABLE 4 Annual compound growth rate of *RGDPnapc* COMECON countries and Western Europe for 1980–1988

Data Source: Bolt et al., 2018, author's calculations. See Appendix B for calculation *RGDPnapc* rates.

1981–1985 with a high of 6% in 1987. For the Soviet Union, GNP growth is 3.7% for 1981–1985 with a high of 5.5% in 1988. The official figures show slower growth in the other countries but generally a little higher than growth indicated by *RGDPnapc*. For example, growth in Czechoslovakia in 1981–1985 is 1.7% but is around 2–3% for 1986–1988 (Kornai, 1992, pp. 194–195).

Table 4 estimates are from the western Research Project on East Central Europe for the East European countries except Romania, and from the CIA for Soviet growth. The MPD 2010 figure used the Research Project estimate for Romania and it showed −0.15 growth for 1980–1988. The Romanian figure in Table 4 used in MPD 2018 is from 2012 and was calculated by a Romanian academic and is 1.82%. Therefore, the only growth rate figure not calculated by the Research Project or the CIA shows the highest growth in COMECON.

It may be that if the Research Project underestimate the Romanian figure, it underestimates others too. The World Bank country expert for Hungary, Ed Hewett argues that the Research Project on National Income underestimates Hungarian growth.

He points out that, as we have seen in Section 6.1, the Research Project on National Income calculates GDP growth in quantitative terms, not value terms. They calculate economic growth by estimating the growth of products in physical output valued at the factor costs of the base year. This is opposed to the usual method that deflates current price GDP for each year to create a constant price GDP growth series. The usual method should take into account price increases that reflect quality, rather than inflation. The usual method should give a higher GDP growth figure if quality is improving.

According to Hewett, the Hungarian statistical agency was careful not to allow price increases to appear as increases in GDP because of falsely claimed quality improvements and he doubted that where this did occur it would have radically changed GDP (Hewett, 1985, pp. 27–30). He believes that Hungary's Central Statistical Office produced high-quality data (Hewett, 1985, p. 32).

The Research Project on National Income responded to this criticism by arguing that it revalued the relative factor cost weights of the economic sectors used to calculate growth rates every 10 years. It claimed this should reduce the impact that the quality problem has on growth rates (Alton et al., 1992, p. 10). However, revaluing the weights every 10 years probably does not entirely end the quality problem.

What is a problem for the Research Project's Hungarian statistics would also be a problem for the statistics calculated for other countries. Boretsky criticized the CIA's Soviet GDP growth series on the same lines as Hewett (Boretsky, 1987, pp. 518–519). It is a quantitative measure that does not take account of quality changes in the period they are measuring.

The CIA did respond to Boretsky's criticism and concluded that they had only been underestimating GDP growth by between −0.1% and −0.3% a year (JEC, 1990, p. 48). This reply was based on some fairly arbitrary estimates by CIA analyst James Noren (JEC, 1990 p. 47). For example, he just dealt with the possibility of bias in the CIA's estimate of the growth of the chemical sector by assuming a small overstatement in some areas and a small understatement in others without clear justification. Noren admits himself that his sensitivity testing is "primitive" (CIA, 1988, p. 76).

It may well be true that most of the COMECON countries were enjoying economic growth reasonably close to the West European average between 1980 and 1988. However, even if we accept the *RGDPnapc* figures as correct, they show an average annual growth of 1.02% for Eastern Europe from 1980 to 1988 (the MPD 2018 definition of Eastern Europe includes the Soviet Union). Economic growth in both Western and Eastern Europe from 1989 to 2016 was on average 1.1% per year. The West European figure for 1980–1988 is flattered by a spurt in the mid to

later part of the 1980s that was generally not sustained (Bolt et al., 2018). Looking at things very broadly, there was no economic reason for the COMECON countries to abandon their system and choose another one purely based on economic growth considerations.

7.2 | The failure of investment in the late communist era

The orthodox explanation for the failure of communism has been the "extensive growth" theory. Critics argue that communist regimes were only effective economically when they were transferring large numbers of workers from low productivity peasant agriculture to higher productivity industry. This is seen as a one-off gain in productivity. Once this takes place it is believed increasing capital investment in industry does not increase growth because critics claim there is less incentive for enterprises to adopt innovations in state-owned economies. Thus, it is thought that socialist economies invest a great deal to try and achieve growth, but productivity is poor, and output is much less per unit of investment than is the case in market economies (Allen, 2003, pp. 190–191).

7.3 | Investment in Eastern Europe

In a recent study, Vonyo and Klein point out that it makes little sense to use adjusted figures for GDP growth from the Research Project on National Income but use official data for investment levels, which is generally what western writers on the subject have done. They develop a new series for investment levels as a percentage of GDP for Czechoslovakia, Hungary, and Poland. Vonyo and Klein's approach is to use the Research Project on National Incomes figures to calculate investment levels in these countries while accepting the Project's GDP growth figures.

The Research Project calculates an index of domestic use that includes consumption, government spending, and a residual. Vonyo and Klein analyze the contents of the residual to isolate the equipment component and use the Research Project's index on construction investment. They use this to construct a post-1965 investment index. The Research Project links this index to pre-1965 figures they calculate for production of investment goods and construction (Vonyo & Klein, 2019, pp. 325–326). They admit their approach may contain hidden inflation and thus overestimate investment (Vonyo & Klein, 2019, p. 326). However, they think it eliminates the other causes of investment overestimation. The authors argue that official figures contained more or less deliberate distortions of investment levels such as adding invented figures for research and development (R&D) to the investment total (Vonyo & Klein, 2019, p. 322).

Vonyo and Klein find that official figures for investment from 1970 in Czechoslovakia and Hungary were a significant overstatement, and Poland was always overstated under communism. Actual investment as a proportion of GDP was rarely above 25% (except for a few years in Poland in the 1970s) and started to fall in these countries, from the late 1970s. For most of the period, these rates were significantly below investment rates in Southern Europe (Vonyo & Klein, 2019, pp. 330–331).

Vonyo and Klein use their investment series and employment data to calculate total factor productivity (TFP) growth or the part of GDP growth attributable to increases in productivity rather than increases in employment, capital, and land. They find it was positive in all three countries in the 1970s and 1980s. TFP growth was higher in all countries in the 1950s and

1960s than afterwards but looked at together the three countries do not show a clear pattern of linear decline (Vonyo & Klein, 2019, p. 335).

Falls in investment were, the authors believe, due to austerity caused by higher oil prices in the 1970s and the increase in world interest rates which increased the burden of debt repayment (Vonyo & Klein, 2019, p. 339).

Accepting Vonyo and Klein's account might seem to undermine Hewett's endorsement of official Hungarian figures. However, Vonyo and Klein argue that capital formation totals often bore no relation to machinery and construction totals in the national accounts (Vonyo & Klein, 2019, p. 322). It may be that some figures in the national accounts were indeed reliable, but there was also a propagandistic attempt to issue high investment figures for public consumption that did not necessarily affect the other figures.

Vonyo and Klein show how accepting western estimates of COMECON GDP figures has to mean using data from the same sources to calculate investment as a percentage of GDP for consistency. This makes the extensive growth theory dubious. If their account of East European growth is correct, then there is no evidence to disprove the common sense idea that the East European economies would have been able to grow faster by investing more. This would have meant an initial diversion of resources from consumption which may have dissuaded the COMECON governments from taking such a course at a time of austerity. However, it might have been more sensible after the harsh international conditions of the 1980s passed if the regimes had survived.

8 | SOVIET INVESTMENT AND DEFENSE SPENDING

R. C. Allen argues that Soviet inefficiency, in terms of investment levels compared to GDP growth, becomes a major problem from the early 1970s. He believes this was due to a combination of poor investment decisions and the need to find new energy sources (Allen, 2003).

Version 9.0 of the Penn World Table (PWT), which was current at the time of MPD 2018, shows investment as a proportion of GDP rates for the former republics of the USSR for 1990 (Feenstra et al., 2015). Some like the figures for Uzbekistan at 11% or Lithuania at 17% are low. Russia and Kazakhstan are much higher at 42% and 43%. The PWT 5.6 Soviet figure for 1989 (the last time a Soviet figure was released) is 34.9% (Heston et al., 1994).

It may be that R. C. Allen is assuming that Soviet investment was greater than it actually was. Hidden defense spending at least partly explains the apparently large Soviet investment burden. Soviet investment figures included concealed weapons expenditure. John Pitzer of the CIA stated when analyzing Soviet economic data that:

> "Defense expenditures will continue to be a problem because of our belief that many of the other product components of GNP, such as investment in machinery and equipment, contain portions of defense expenditures."
>   (CIA, 1990, p. 24)

Maddison also states that CIA estimates of Soviet investment figures contain military expenditures that would be included as current military spending in western national accounts. According to Maddison, the CIA did this because they had trouble identifying the output of military equipment in the Soviet investment figures they were analyzing. Maddison, therefore, suggests reducing the CIA's 1982 estimate of Soviet fixed investment from 28% to 22.1% of GDP as

a result of adjusting for defense as well as adjusting for the way the CIA estimated capital repairs (Maddison, 1998, p. 314).

However, we are talking about GDP measured in roubles here, not an international dollar figure. Maddison's estimate of investment as a percentage of GDP makes Soviet investment levels similar to western levels. This is not the same as a PWT calculation of investment share based on what Soviet investment would have cost at international prices. PWT boosts the investment share significantly for the USSR by applying international prices. But we do not know what would happen if it used an accurate picture of investment, and deducted weapons valued at international prices from the investment share. Given these uncertainties, it may be best not to assume that the Soviet investment share was as vast as the PWT suggests and that a proportion of PWT Soviet "investment" should be included in government spending for defense. In the case of the USSR, evidence for the "extensive growth theory" is again lacking.

9 | CONCLUSION

Evidence from the GDR, three Eastern European countries and the USSR suggests poor investment may have prevented the COMECON countries catching up with the West. Alternatively, COMECON economic growth was underestimated by western analysts, and the COMECON countries could have gradually converged with the West if the regimes had survived. Romania's economic growth is interesting in this context.

If higher economic growth is required as well as equity, then the right policies must be put in place. Growth can come from improvements in labor productivity which come from improved training and education. It can also come from increased funding for R&D to boost the potential technological level of the economy. Finally, it can come from increased investment. The advantage of socialism is that the government has a greater ability to take direct control of these efforts. They do not have to hope that private companies will have the necessary confidence in the future state of the market to invest in research or capital. The government can do the investment themselves and match customers to suppliers in the central plan.

In developing countries, socialism could facilitate the type of high investment levels necessary for growth. In the developed world, socialism may be more about promoting equality than maximizing future growth.

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REFERENCES

Allen, R. C. (2003). *Farm to factory: A reinterpretation of the Soviet industrial revolution*. Princeton and Oxford: Princeton University Press.

Alton, T., Badach, K., Bakondi, R., Bass, E., Brumaru, A., Bombelles J., Lazarcik, G., and Staller, G. (1992) *Economic growth in Eastern Europe 1975–1991*. Research Project on National Income in East-Central Europe, OP-120. L.W. International Financial Research.

Axenciuc, V., & Georgescu, G. (2017). *Gross domestic product – National income of Romania 1862 – 2010*. Secular statistical series and methodological foundations. MPRA Paper. University Library of Munich.

Bifani, P. (1990). International trade from the 1980s to the 1990s: The Latin American perspective. *IDS Bulletin*, *21*(1), 79–78. https://doi.org/10.1111/j.1759-5436.1990.mp21001011.x

Birman, I. (1989). *Personal consumption in the USSR and the USA*. New York: Macmillan.

Bolt, J., Inklaar, R., de Jong, H., & van Zanden, J. L. (2018). *Rebasing 'Maddison': New income comparisons and the shape of long-run economic development*. Maddison Project Working paper 10. Maddison Project Database version 2018. Retrieved from https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2018

Boretsky, M. (1987). The tenability of CIA estimates of Soviet economic growth. *Journal of Comparative Economics*, *11*(4), 517–542.

CIA. (1979). *An analysis of the behavior of Soviet machinery prices 1960–73*. Washington, DC: Central Intelligence Agency.

CIA. (1988). *The impact of Gorbachev's policies on Soviet economic statistics*: *A conference report*.

CIA. (1990) *Measuring Soviet GNP: Problems and solutions*. A conference report.

Crowther, W. (1988). *The political economy of Romanian socialism*. New York/Westport, Connecticut/London: Praeger.

Darvas. (2015). *The convergence dream 25 years on*. Retrieved from https://bruegel.org/2015/01/the-convergence-dream-25-years-on/

Department of Defense. (1989) *Soviet military power*: *Prospects for change*. Virginia: Department of Defense.

ECE (Economic Commission for Europe), & UN. (1994). *International comparison of gross domestic product in Europe 1990*. New York and Geneva: United Nations.

Federal Government Commissioner for the New Federal States. (2017). *Annual report on the status of German unity*. Federal Ministry for Economic Affairs and Energy.

Feenstra, R. C., Inklaar, R., & Timmer, M. P. (2015). The next generation of the Penn World Table. *American Economic Review*, *105*(10), 3150–3182.

Filer, R., & Hanousek, J. (2003). Inflationary bias in mid to late transition Czech Republic. *Economic Systems*, *27*(4), 367–376. https://doi.org/10.1016/j.ecosys.2003.10.002

Franz, A. (1999). Comparisons for countries of Central and Eastern Europe: An informal report. In A. Heston & R. Lipsey (Eds.), *International and interarea comparisons of income, output, and prices (pp. 239–250)*. Chicago and London: The University of Chicago Press.

Hanousek, J., & Filer, R. K. (2004). Consumers' opinion of inflation bias due to quality improvements. *Economic Development and Cultural Change*, *53*(1), 235–254.

Heston, A., Summers, R., & Aten, B. (1994). *Penn World Table*. Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania. Retrieved from https://www.rug.nl/ggdc/productivity/pwt/pwt-releases/pwt-5.6

Hewett, E. (1985). *The gross national product of Hungary*: *Important issues for comparative research*. World Bank Staff Working Papers 775.

Hill, M., & McKay, R. (1988). *Soviet product quality*. Houndmills, Basingstoke and London: Macmillan Press.

ICP. (2019). *International Comparison Program (ICP)*. Retrieved from https://www.worldbank.org/en/programs/icp

JEC. (1990). *Measures of Soviet gross national product in 1982 prices*. US Government Printing Office.

Kornai, J. (1986). The Hungarian reform process: Visions, hopes and reality. *Journal of Economic Literature*, *24*(4), 1687–1737.

Kornai, J. (1992). *The socialist system: The political economy of communism*. Oxford: Princeton University Press.

Kravis, I., Heston, A., & Summers, R. (1982). *World product and income. International comparisons of real gross product*. World Bank, John Hopkins University Press.

Maddison, A. (1995). *Monitoring the world economy 1820–1992. Development centre studies*. OECD.

Maddison, A. (1998). Measuring the performance of a communist command economy: An assessment of the CIA estimates for the USSR. *Review of Income and Wealth*, *44*(3), 307–323. https://doi.org/10.1111/j.1475-4991.1998.tb00284.x

Maddison, A. (2006). *The world economy volume 1*: *A millennial perspective and volume 2*: *Historical statistics*. Retrieved from https://dx.doi.org/10.1787/9789264022621-en

Maddison Project Database, version 2010. Retrieved from https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-database-2010

Nove, A. (1980). *The Soviet economic system* (3rd ed.). Boston, London, Sydney: Allen & Unwin.

Nove, A. (1989). *Glasnost' in action: Cultural renaissance in Russia*. Boston, London, Sydney, Wellington: Unwin Hyman.

Nove, A. (1992). *An economic history of the USSR 1917–1991* (3rd ed.). London: Penguin.

OECD. (2018). *Purchasing power parities*. Retrieved from https://data.oecd.org/conversion/purchasing-power-parities-ppp.htm

Ritschal, A., & Vonyo, T. (2014). The roots of economic failure: What explains East Germany's falling behind between 1945 and 1950? *European Review of Economic History*, *18*(2), 166–184.

Samel, B. R., Henthorne, T. L., & Warren, T. C. (1993). A process for determining an ATM pricing strategy. *Journal of Retail Banking*, *15*(2), 25–29.

Schmidt, J., & Bijmolt, T. H. A. (2019). Accurately measuring willingness to pay for consumer goods: A meta-analysis of the hypothetical bias. *Journal of the Academy of Marketing Science*. https://doi.org/10.1007/s11747-019-00666-6

Sleifer, J. (2006). *Planning ahead and falling behind: The East German economy in comparison with West Germany 1936–2002*. Berlin: Akademie Verlag.

Summers, R., & Heston, A. (1988). A new set of international comparisons of real product and price levels estimates for 130 countries, 1950-1985. *Review of Income and Wealth*, *34*(1), 1–25.

Tittenbrun, J. (1993). *The collapse of "real socialism" in Poland*. London: Janus Publishing.

UN. (1994). *World comparison of real gross domestic product and purchasing power, 1985, phase V of the International Comparison Programme, United Nations, New York 1994*. Retrieved from https://unstats.un.org/unsd/methods/icp/gdp/gdp01_htm.htm

UN. (2019). *National accounts-analysis of main aggregates*. Retrieved from https://unstats.un.org/unsd/snaama/index

Vogt, W. (1989). Beyond the bean count. Quality/quantity assessment of conventional forces. *International Defense Review*, *22*(3), 273–277.

Vonyo, T., & Klein, A. (2019). Why did socialist economies fail? The role of factor inputs reconsidered. *Economic History Review*, *72*(1), 317–345.

World Bank/Goskomstat (1995) *Russian Federation: Report on the national accounts*. Washington, DC: World Bank/Government of the Russian Federation.

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APPENDIX A: CALCULATION OF *CGDPPC* FIGURES FOR EASTERN EUROPE AND USSR IN TABLE 2

USSR

The figure in Table 2 for the USSR is not the figure provided by MPD 2018 for the "Former Soviet Union."

The Table 2 USSR figure is calculated by the author by adding separate *CGDPpc* figures multiplied by population for all 15 republics and then dividing by total population of the Soviet

Union. The result is a figure that is 64% of the Western European figure, as Table 2 shows. MPD 2018 calculates regional figures for *CGDPpc* in the same way, for example, its regional figure for Western Europe (Bolt et al., 2018).

The *CGDPpc* figures to 1990 for the 15 Soviet republics are calculated by extrapolating back from the 1996 benchmarks (1999 for the Baltic States) to 1990 for each republic using national account figures from the postcommunist era. They are calculated for 1973–1990 by using CIA derived GDP growth rate figures to extrapolate back from 1990 (see Appendix B).

The MPD 2018 "Former Soviet Union" *CGDPpc* figures are much higher than the figures used to calculate the USSR *CGDPpc* in Table 2. From 1950 to 1989, they are consistently at around 85–90% of the Western European average.

The "Former Soviet Union" figure is interpolated between a 1955 benchmark, based on Soviet data, that Abram Bergson calculated (Bolt et al., 2018) and a 1996 benchmark using ICP data.

The 1996 "Former Soviet Union" *CGDPpc* benchmark is almost the same as the 1996 benchmark for Russia when the *CGDPpc* figures for the 15 Republics would indicate the Soviet figure should be significantly lower than the Russian figure. The author enquired with the Maddison Project Database team concerning this disparity. They acknowledged the apparent anomaly but were unable to provide a reason before the completion date of this article.

Due to uncertainties about the "Former Soviet Union" figure, it is best to use the 15 Soviet Republic figures that rely only on 1996 or 1999 benchmarks for each republic and the western calculated GDP growth rates for 1973–1990. This method also appears to give a more realistic figure.

The World Bank made a very extensive enquiry into the Russian GDP figures for 1990–1994 and recommended revisions to the economic growth figures for each year. These figures are included in the current UN national accounts figures for Russia (UN, 2019). The World Bank stated that the decline in growth had been overestimated, one reason being that the method of calculating producer price indexes had not entirely changed from the old system to a system suitable for a market economy. For example, they stated that the 1991 growth rate decline should be reduced from −12.8 in the official figures to −5, and the 1992 growth rate decline reduced from −19.0 to −14.5 (World Bank/Goskomstat, 1995, pp. 81–82, 89–90). To calculate these rates, the World Bank used physical indicators of production for growth rather than using the conventional method of trying to deflate current price values with the producer price index.

Bulgaria

The *CGDPpc* figures are calculated by MPD 2018 by interpolation for all years after 1999. The figures before that are calculated by extrapolation back from 1999.

Czechoslovakia

MPD 2018 derives the figures for Czechoslovakia through interpolation. In 1988, it is 17,361. Unlike the Soviet Union, the *CGDPpc* for the whole of Czechoslovakia in 1988 does not hugely diverge from the separate *CGDPpc* figures for the Czech and Slovak Republics. These can be multiplied by population, added, and divided by the whole population of Czechoslovakia. This gives a 1988 *CGDPpc* of 18,284. As the figures are calculated by different methods, there will be some disparity, but it is not unrealistic. The *CGDPpc* figure for Czechoslovakia is therefore accepted.

Hungary

The figures are calculated by MPD 2018 by interpolation. The ICP calculated the 1988 figure with a benchmark year of 1985 ICP benchmark and a 1996 benchmark.

Poland

Figures are calculated by MPD 2018 by interpolation. Poland has an ICP benchmark year of 1985 and a 1996 ICP benchmark

Romania

Calculated by interpolation. Romania has an ICP benchmark in 1975 and another ICP benchmark in 1999.

APPENDIX B: THE CALCULATION OF GROWTH RATES

MPD 2018 uses western or postcommunist calculated GDP growth data to calculate the *CGDPpc* figures for the communist era. The same sources are used to calculate the *RGDPnapc* figures. The sources are below.

USSR

The GDP growth rates for 1973–1990 were calculated by Angus Maddison. He took the Net Material Product (NMP) figures for each of the republics from the Soviet national accounts and then applied a ratio of 0.49075 which reduces the NMP figure to arrive at the GDP figure. The CIA calculated the ratio for the purpose of estimating Soviet GDP figures (see Maddison, 1995, p. 141; Maddison, 2006, p. 182; Maddison, 1998, p. 313). Maddison then calculated a separate economic growth rate for each of the 15 Republics using this ratio (Maddison, 2006, p. 156). The CIA figures quoted here are intended to take into account alleged distortions in Soviet growth (see above).

Bulgaria, Czechoslovakia, Hungary, and Poland

The MPD 2018 uses the same GDP data as Angus Maddison to compile its *RGDPnapc* figures for 1975–1990 Bulgaria, Czechoslovakia, Hungary, and Poland. The New York based Research Project on National Income in East Central Europe compiled the growth rate figures for these countries (Maddison, 1995, pp. 140–141; Maddison, 2006, pp. 469–470, p. 156).

Romania

Time series figures for Romania were recalculated after the communist era (see Bolt et al., 2018) by Victor Axecunic. For an English language version of Axecunic's work, see Axenciuc and Georgescu (2017). The time series in MPD 2010 is different and used figures from the Research Project on National Income in East Central Europe (Maddison, 1995, p. 141, 470).