U.S. Infrastructure: 1929-2023

Ray C. Fair*

February 2025

Abstract

This paper examines the history of U.S. infrastructure since 1929 and in the process reports an interesting fact about the U.S. economy. Infrastructure stock as a percent of GDP began a steady decline around 1970, and the government budget deficit became positive and large at roughly the same time. The infrastructure pattern in other countries does not mirror that in the United States, so the United States appears to be a special case. The overall results suggest that the United States became less future oriented beginning around 1970, an increase in the social discount rate. This change has persisted. This is the interesting fact. The paper contains speculation on possible causes.

1 Introduction

This paper examines the history of U.S. infrastructure since 1929 and in the process reports an interesting fact about the U.S. economy. Annual U.S. data for the 1929–2023 period on government fixed assets from the Bureau of Economic Analysis (BEA) show a large and close-to-monotonic decline in the size of infrastructure stock as a percent of GDP beginning around 1970 for most categories of infrastructure, both defense and nondefense. It is also the case, as will be seen, that the government budget deficit as a percent of GDP changed around 1970 from

*Cowles Foundation, Department of Economics, Yale University, New Haven, CT 06520-8281. e-mail: ray.fair@yale.edu; website: *fairmodel.econ.yale.edu*. I would like to thank Leah Brooks, Edward Glaeser, Jesse Shapiro, and Robin Westen for helpful comments.

being close to zero to being large and positive.[1] This change in the deficit has been sustained except for a brief period in the late 1990's. The deficit data thus show that the government began consuming more relative to its income around 1970, and the infrastructure data show that the government began investing less as a fraction of GDP around the same time.

This paper also examines the history of infrastructure for other countries using annual data for the 1960–2019 period from the International Monetary Fund (IMF). It will be seen that no other country has a pattern similar to that of the United States, namely a roughly monotonic decline in the ratio of infrastructure to GDP beginning around 1970. The United States appears to be a special case in this regard, although some countries have seen large declines beginning somewhat later.

The overall results thus suggest that the United States became less future oriented, less concerned with future generations, beginning around 1970, an increase in the social discount rate. This change has persisted. This is the interesting fact. Whether it can be explained is unclear. Section 4 contains speculation about possible causes. An explanation consistent with the fact is that it was triggered in part by a change in tastes beginning with the Woodstock generation and in part by a reaction to the environmental costs of the urban renewal projects of the 1950's and 1960's.

Most of the work using the BEA and IMF data has been concerned with estimating the effects of infrastructure on aggregate output. Aschauer (1989) used an early version of the BEA data to examine whether private sector total factor productivity was affected by public sector infrastructure. Ford and Foret (1991) examined this question for other countries using the IMF data. Munnell (1992) is an early review article. A large literature followed Aschauer (1989), and much of this literature has been summarized in a meta study by Bom and Ligthart (2015). They reviewed 68 studies for the 1983–2008 period. A later study using panel time

[1] "Government" here means both the federal government and state and local governments. More will be said about this below.

series data is Calderón, Moral-Benito, and Servén (2015). This question, while interesting, is not of concern here. Rather, the focus is on the historical patterns of infrastructure—category by category for the United States and country by country for the other countries. It does not appear that this type of examination has been done before. There has been, of course, much discussion about the sad state of U.S. infrastructure, with many examples, but now systematic examinations.

Section 2 discusses the BEA fixed asset data and presents the U.S. graphs. It also examines the data on the government budget deficit. Section 3 discusses the IMF data and presents the international graphs. Section 4 contains speculation.

2 U.S. Data

Infrastructure

The BEA data are taken from Table 7.2 from the Fixed Assets Accounts (FAA) tables, dated October 2, 2024. These data are index numbers, and they were converted to 2017 dollars by using the nominal values for 2017 from Table 7.1. The two main categories in the BEA data are defense and nondefense. Nondefense includes both the federal government and state and local governments. Within defense are structures, and intellectual property products (IPP), and equipment. Defense equipment includes aircraft, missiles, ships, vehicles, and electronics. Within nondefense there are also equipment, IPP, and structures. The two largest categories within nondefense structures are educational and highways and streets. Other categories are transportation, power, sewer systems, and water systems. The transportation category does not include highways and streets in the FAA. Highways and streets is a much larger category. Transportation includes air passenger terminals, runways, land passenger terminals, mass transit, docks, and marinas.

In terms of notation, let D denote defense. The three subcategories are structures (S), IPP (I), and equipment (E). So three variables are DS, DI, and DE.

Let N denote nondefense. In BEA Table 7.2 nondefense is disaggregated into federal and state and local, and for present purposes these have been aggregated. The three subcategories are the same as for defense, so three variables are NE, NI, and NS. Under NS, two subcategories mentioned above are examined, educational and highways and streets, denoted $NS1$ and $NS2$ respectively. The fixed asset data are constructed using the perpetual inventory method—see U.S. Department of Commerce (2003) plus discussion on the BEA website: $www.bea.gov$. The value of total government defense assets is $DS + DI + DE$, and the value of total government nondefense assets is $NE + NI + NS$. The value of total government assets is $D + N$. For reference, this notation is listed in Table 1.

The reason that the federal government and state and local governments have not been treated separately is that much of the infrastructure investment done by state and local governments is financed by the federal government through grants in aid. The interest here is on total government infrastructure.

As noted in the Introduction, the infrastructure data have been divided by GDP for the analysis. Real GDP data were obtained from the BEA National Income and Product Accounts (NIPA), Table 1.1.6, dated December 19, 2024. The data are in billions of 2017 dollars. They are available on an annual basis back to 1929. Let Y^a denote real GDP. Y^a is cyclical, and to avoid having the ratio of assets to GDP be cyclical because of this, a non-cyclical measure of GDP was constructed. $\log Y^a$ was plotted for the 1929–2023 period, and a peak-to-peak interpolation was done. The peaks were 1929, 1968, 2005, and 2023. In a few years, like 1943, 1944, and 1945, the actual value was above the line. The three annual growth rates between the peaks are 3.8, 3.1, and 1.9 percent. The non-cyclical measure of GDP was taken to be the exponential of the points on the interpolation lines. The results in this paper are unlikely to be sensitive to other measures of non-cyclical output. Y will be used to denote this non-cyclical measure of GDP, and it will simply be called GDP. Although the asset data are available back to 1925, only data since 1929 have been used because this is where the data on Y^a begin.

Table 1
Variable Notation

DS	Defense Structures.
DI	Defense Intellectual Property Products.
DE	Defense Equipment.
NE	Nondefense Equipment.
NI	Nondefense Intellectual Property Products.
NS	Nondefense Structures.
$NS1$	Educational.
$NS2$	Highways and Streets.
D	Total Defense. $DS + DI + DE$.
N	Total Nondefense. $NE + NI + NS$.
T	Total Infrastructure. $D + N$.

- Nondefense includes federal and state and local.
- Units are billions of 2017 dollars.

Figure 1 plots T/Y for the 1929–2023 period along with its mean over this period. The World War II years and the four years following clearly stand out, as expected. More interesting is the period after the war, say beginning in 1950. Figure 2 plots T/Y for the 1950–2023 period and the mean for this period. The figure shows that between 1950 and 1969 the ratio is fairly flat, and then from 1970 on there is close to a monotonic decline.[2]

Figures 3 and 4 plot defense and nondefense separately. The decline in nondefense began around 1970, but the decline in defense began earlier, in the mid 1950's. The decline in defense infrastructure as a percent of GDP in Figure 3 is large, from 0.45 in 1950 to 0.08 in 2023. Figures 5–7 plot the three subcategories of defense. There is roughly a monotonic decline in structures and equipment. The plot is more erratic for IPP, with decline beginning in the late 1980's. IPP infrastructure is a very small fraction of GDP.

[2]For reference purposes a vertical line has been placed at 1969 in the plots.

Figure 1

Total Infrastructure/GDP (T/Y)

1929--2023

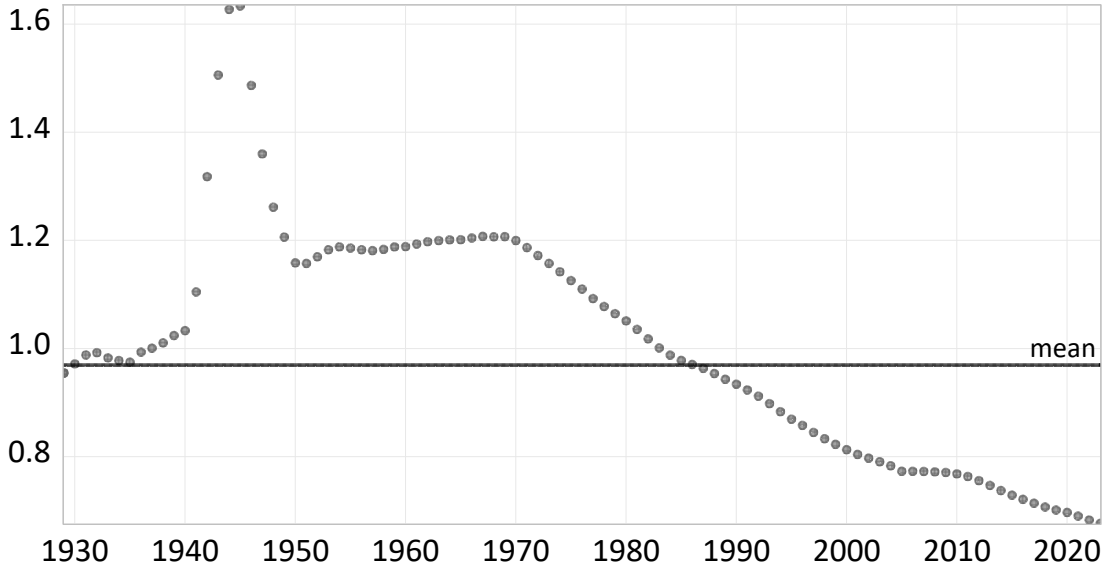


Figure 2

Total Infrastructure/GDP (T/Y)

1950--2023

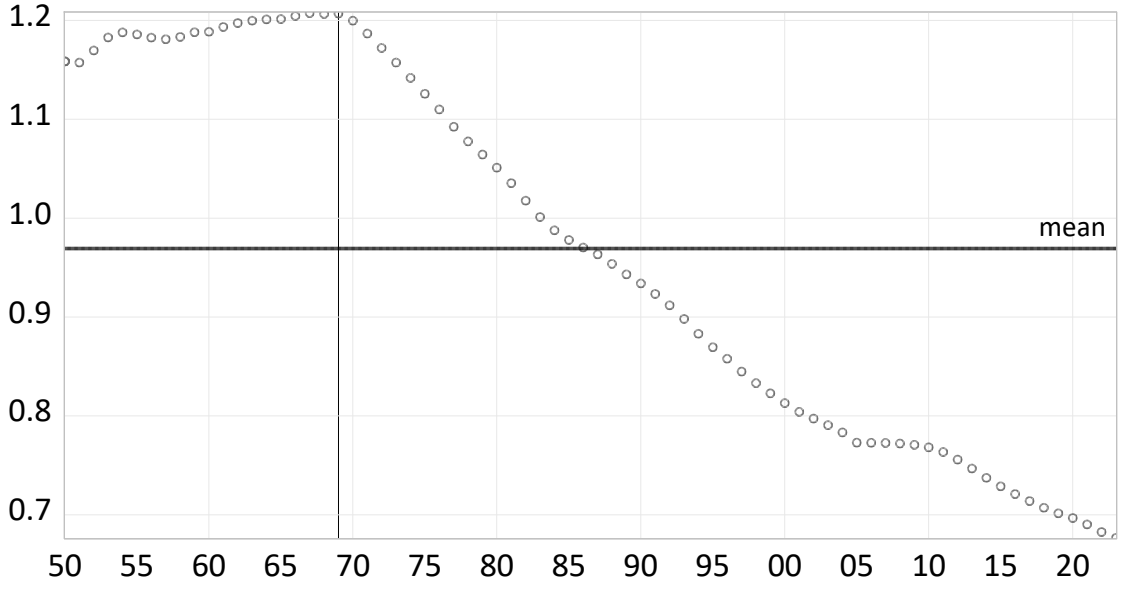


Figure 3

Defense/GDP (D/Y)

1950--2023

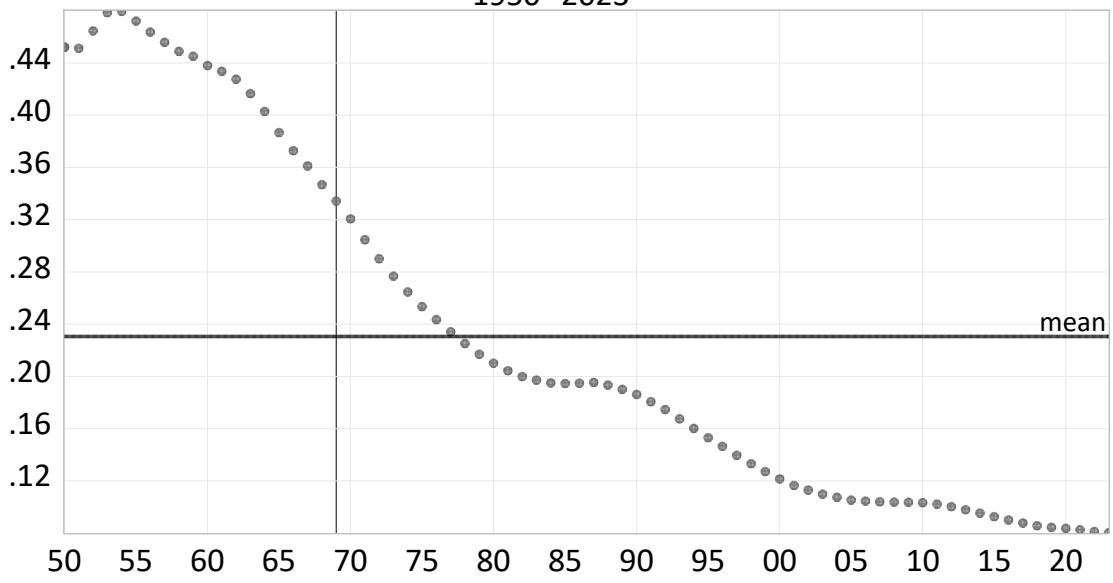


Figure 4

Nondefense/GDP (N/Y)

1950--2023

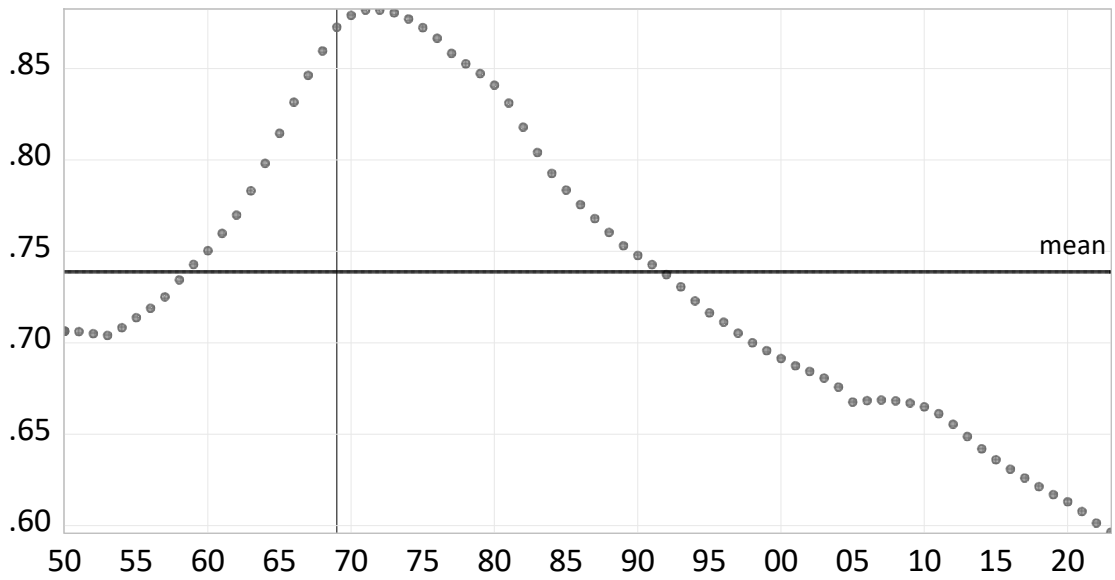


Figure 5
Defense Structures/GDP (DS/Y)
1950--2023

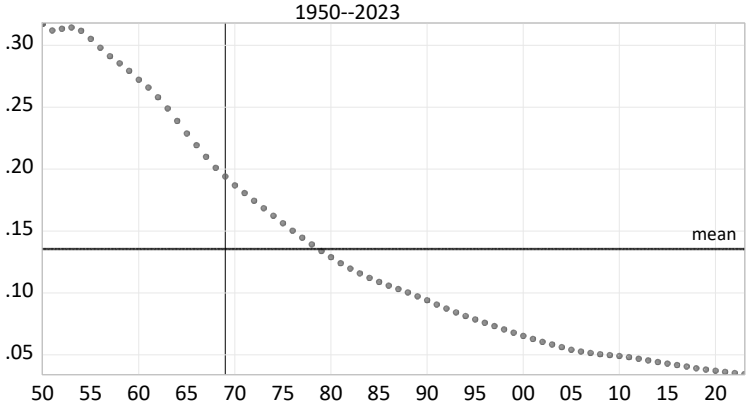


Figure 6
Defense IPP/GDP (DI/Y)
1950--2023

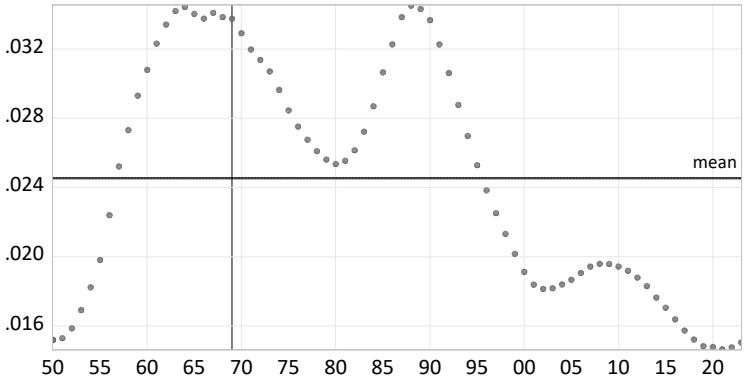
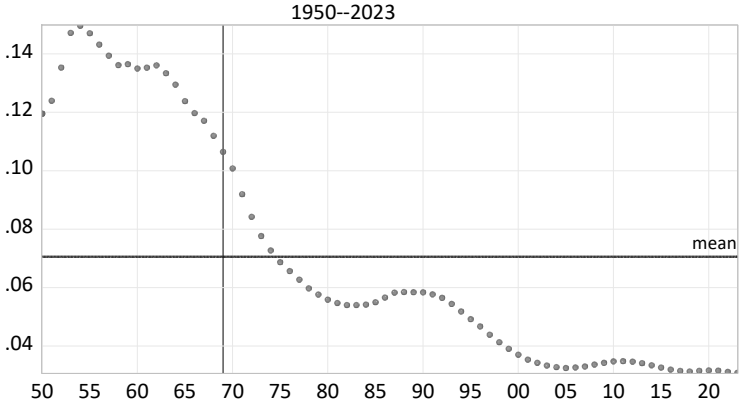


Figure 7
Defense Equipment/GDP (DE/Y)
1950--2023



The large decline in defense infrastructure may seem surprising, since many are of the view that the Unites States is spending too much on the military. The ratio D/Y in Figure 3 does level off in the 1980's before continuing to fall, which reflects the increased spending of the Reagan administration, but the overall trend is clearly downward. One might think that the downward trend is true of defense investment but not defense consumption, but this is not the case. The ratio of defense consumption to GDP has fallen from 0.1499 in 1951 to 0.0280 in 2023. (In this same period the ratio of defense gross investment to GDP fell from 0.0197 to 0.0085.)[3] The overall picture is thus of a substantial decline in defense spending as a percent of GDP since the 1950's.

For nondefense, Figure 4 shows a sharp rise from the 1950's to the early 1970's, where the decline begins. The early rise reflects in part the construction of the interstate highway system and the increase in educational infrastructure driven by the baby boom. The peak ratio was 0.882 in 1971. In 2023 it was 0.596, a large decline.

Figures 8-10 plot the three subcategories of nondefense infrastructure. Both equipment and IPP rise or are flat from 1970, but these are a very small fraction of nondefense infrastructure. Structures dominate, which shows the decline since 1970. Figures 11 and 12 plot the two largest subcategories of nondefense structures, educational and highways and streets.[4] Both show a decline since 1970, although educational levels off in the mid 1990's and then slightly rises.

[3]Defense consumption and defense gross investment are taken from BEA Table 3.9.3, lines 18 and 19. These data are index numbers, and they were converted to 2017 dollars using the dollar values in 2017 in Table 3.9.5. They were then divided by Y.

[4]Fraumeni and Kornfeld (2024) argue that the depreciation rate for highways and streets used by the BEA may be too low, which if so means that the estimates of capital stocks of highways and streets are too high.

Figure 8
Nondefense Equipment/GDP (NE/Y)
1950--2023

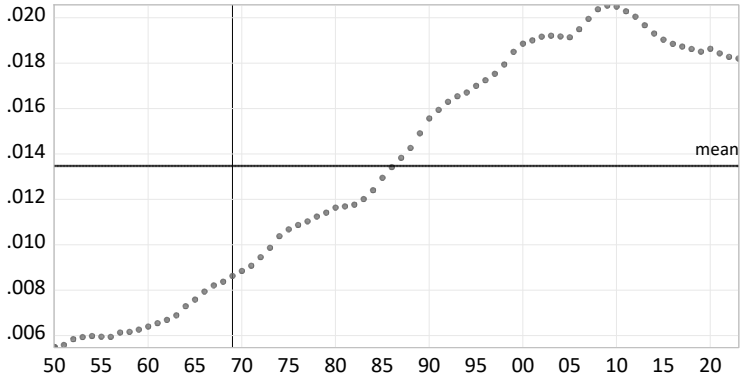


Figure 9
Nondefense IPP/GDP (NI/Y)
1950--2023

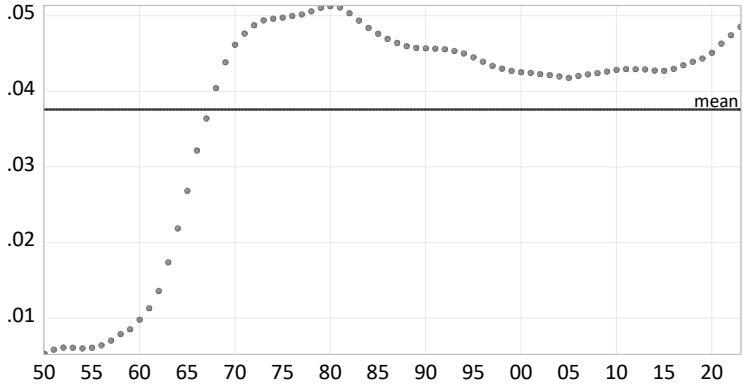


Figure 10
Nondefense Structures/GDP (NS/Y)
1950--2023

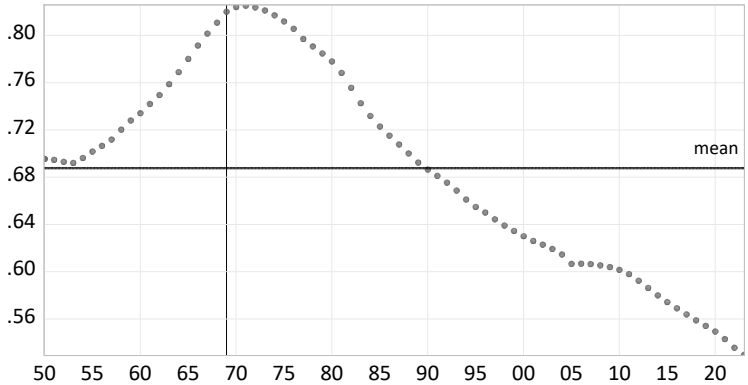


Figure 11

Nondefense Educational/GDP (NS1/Y)

1950--2023

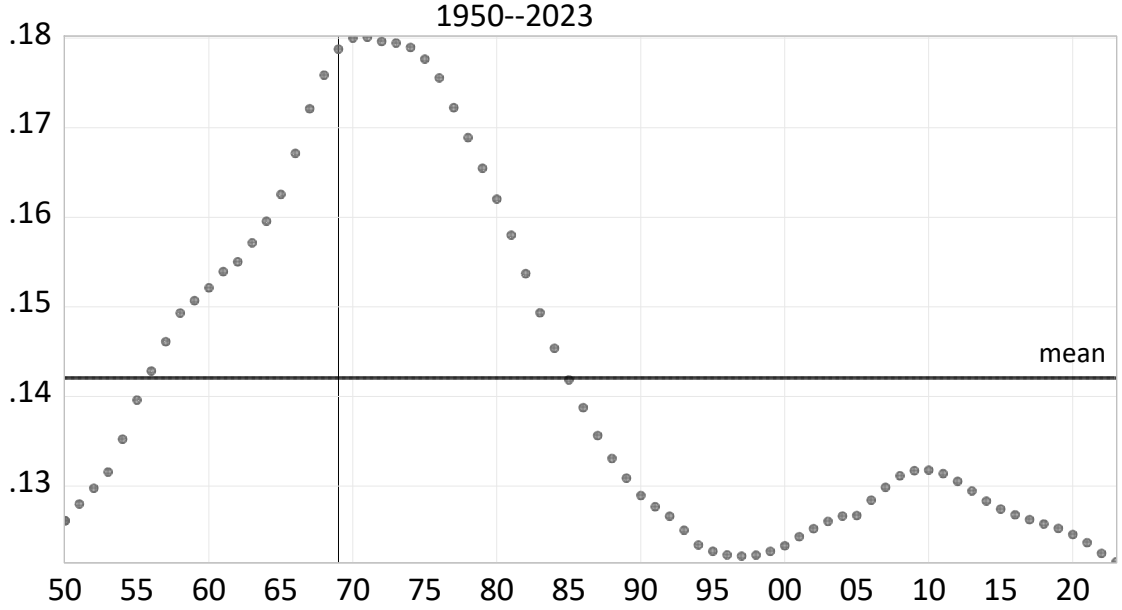
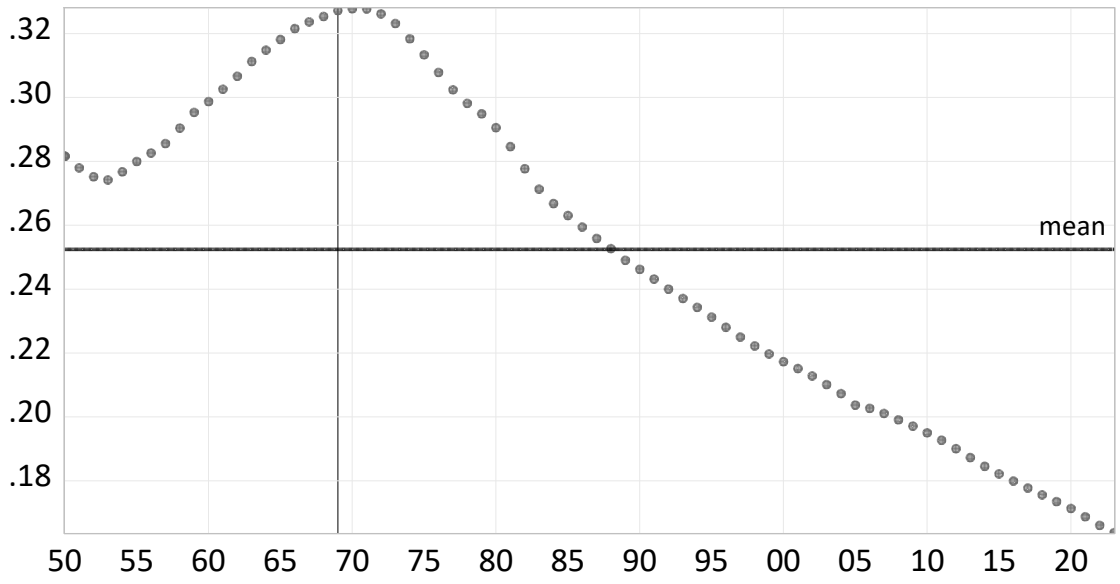


Figure 12

Nondefense Highways and Streets/GDP (NS2/Y)

1950--2023



Infrastructure Shortfall?

Is the decline in the ratio of nondefense infrastructure to GDP a cause for concern? The literature mentioned in the Introduction suggests that infrastructure may have a positive effect on aggregate output, so, other things being equal, declining infrastructure may have a negative effect on output. Also, as discussed in the Introduction, the current political discourse is that infrastructure is too low. Without a model of the optimal size of infrastructure, however, it is unclear how big the problem is if there is in fact a problem. Developing such a model is beyond the scope of this paper.

One can, however, use the present results to consider possible shortfalls. Consider the ratio of nondefense infrastructure to GDP in Figure 4. In 2023 the ratio was 0.60. GDP (Y) in 2023 was \$22.7 trillion, so nondefense infrastructure was 0.60×22.7 = \$13.6 trillion. The mean ratio over the 1950–2023 period is 0.74, and so if the ratio in 2023 were at the mean, nondefense infrastructure would be \$16.8 trillion, \$3.2 trillion more. If the ratio were at the 1970 value, which is 0.88, nondefense infrastructure would be \$20.0 trillion, \$6.4 trillion more. These values are in 2017 dollars. The GDP deflator in 2023 was 1.223, so in 2023 dollars the two shortfalls are \$3.9 trillion and \$7.8 trillion.

The Infrastructure Investment and Jobs Act was signed into law by President Biden on November 15, 2021. The law authorizes \$1.2 trillion for transportation and infrastructure spending with \$550 billion for new investments and programs. The \$550 billion is in 2021 dollars; in 2023 dollars it is about \$600 billion. This is extra spending over 10 years. This is about 15 percent of the \$3.9 trillion shortfall and about 8 percent of the \$7.8 trillion shortfall. Using this metric the size of the bill is modest.

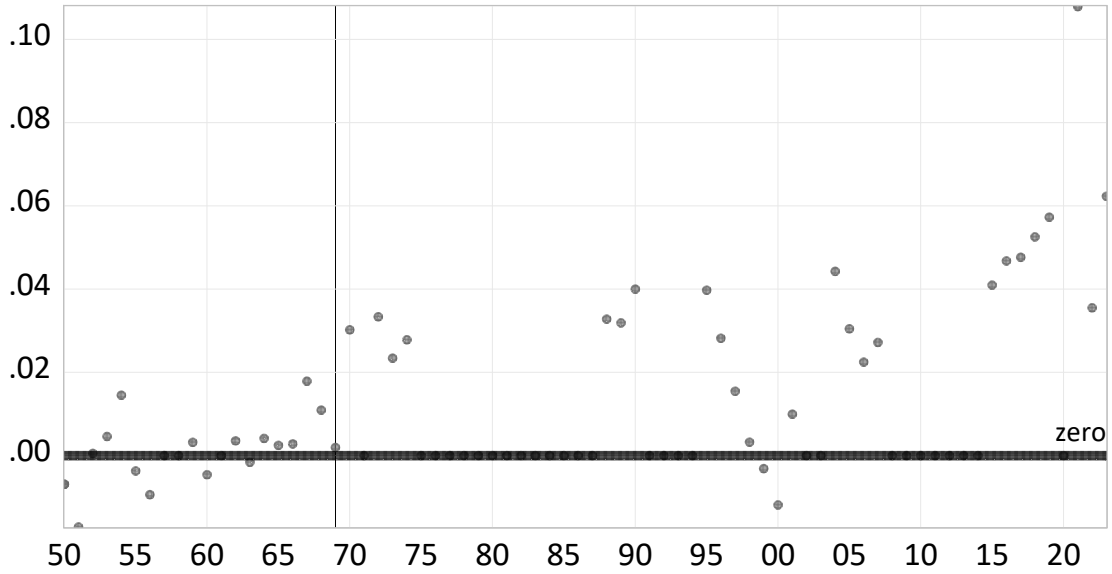
Another way of looking at size of the bill, if the \$600 billion were added to the stock in 2023, which is \$13.6 trillion, (rather than spread out over 10 years) the ratio of the stock of nondefense infrastructure to GDP would be 0.626. This gets the ratio back to its value in 2017, again a modest improvement.

Figure 13

Real Government Deficit/GDP

Values plotted when the unemployment rate was less than 5.7 percent

1950--2023



The Government Budget Deficit

As noted in the Introduction, the government budget deficit as a percent of GDP became large and positive beginning in 1970. The deficit generally increases in recessions, and the interest here is the structural deficit, the deficit at roughly full employment. The mean of the unemployment rate over the 1950–2023 period is 5.7 percent. Figure 13 plots the real government deficit as a percent of GDP for the 1950–2023 period for those years when the unemployment rate was below its mean, periods at least close to full employment. The deficit data are taken from BEA Table 3.1 in the NIPA, dated December 19, 2024. The deficit is the negative of "net government saving" on line 31, which is the difference between current receipts and current expenditures. The main categories of current expenditures are consumption expenditures, current transfer payments, and interest payments. The deficit has been divided by the GDP deflator to put it in real terms, and then the deficit in real terms is divided by Y to compute the ratio. The GDP deflator is taken from Table 1.1.9, line 1, also dated December 19, 2024.

Figure 13 shows that the deficit as a percent of GDP hovered near zero until 1970, when it became positive.[5] It has remained positive except for 1999 and 2000. And it is high by the standards of the 1950's and 1960's except for 1996-2001. This period in large part was driven by the stock market boom that began in 1995. Most of the large deficits are from the federal government.

3 IMF Data and Graphs

The Fiscal Affairs Department of the International Monetary Fund has compiled data on the stock of public capital in 194 counties. The data are annual, and for most countries they begin in 1960. They end in 2019. Data are also available for GDP. The units are in 2017 international dollars. Let T denote the capital stock

[5]The deficits not plotted are generally higher than surrounding values because of the more sluggish economy.

Figure 14

All Countries Public Capital/GDP

1960--2019

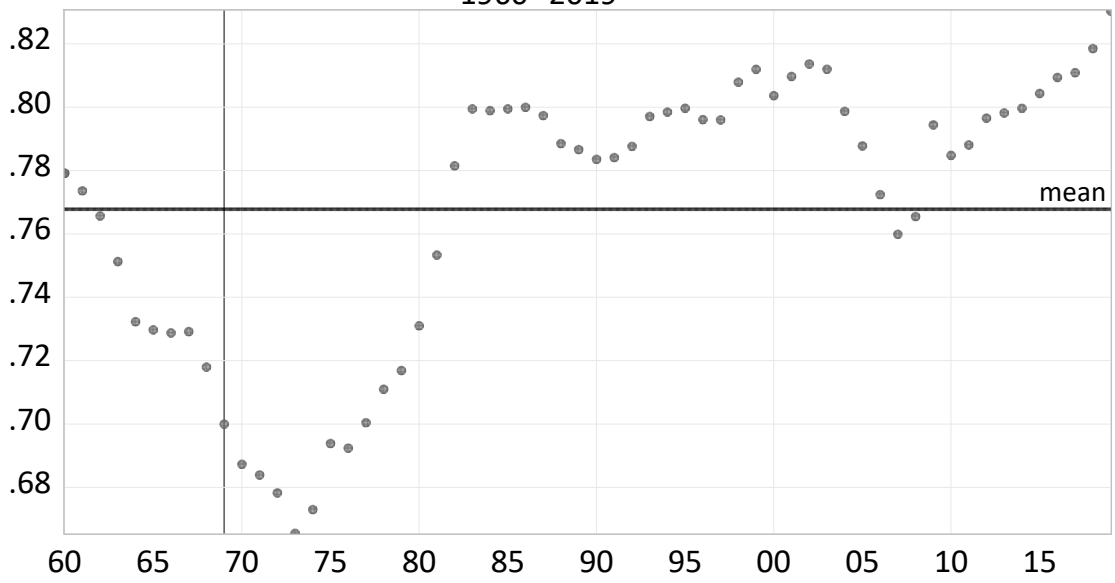


Figure 15

LIDC Countries Public Capital/GDP

1960--2019

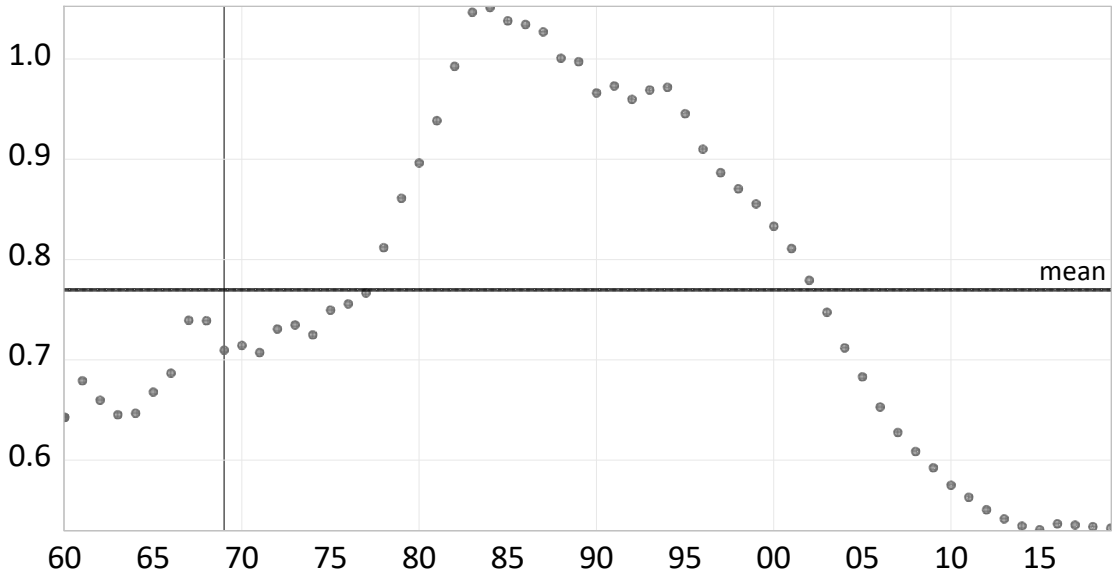


Figure 16

EM Countries Public Capital/GDP

1960--2019

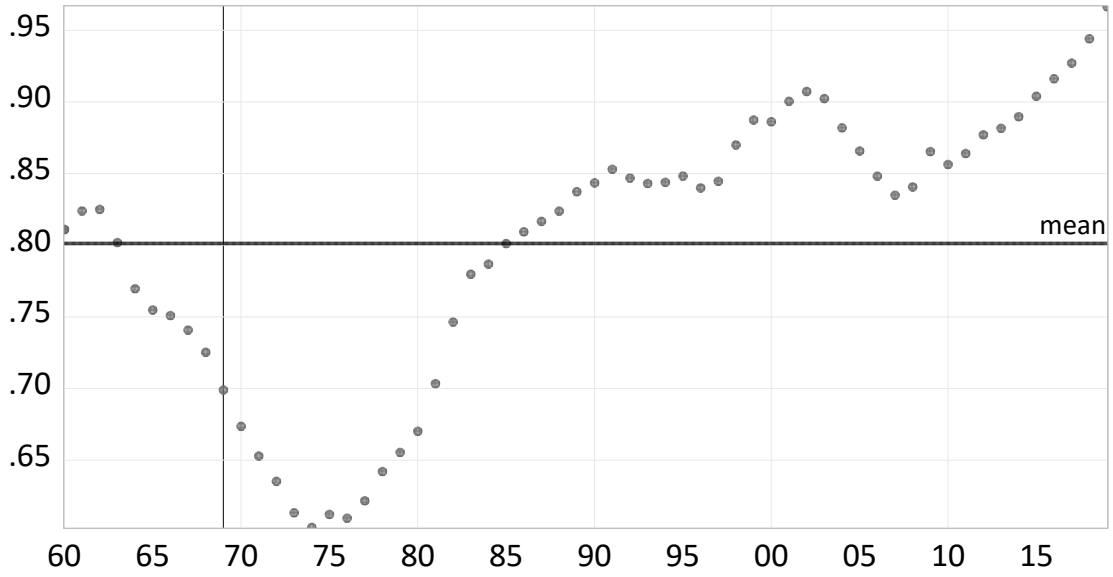


Figure 17

AE Countries Public Capital/GDP

1960--2019

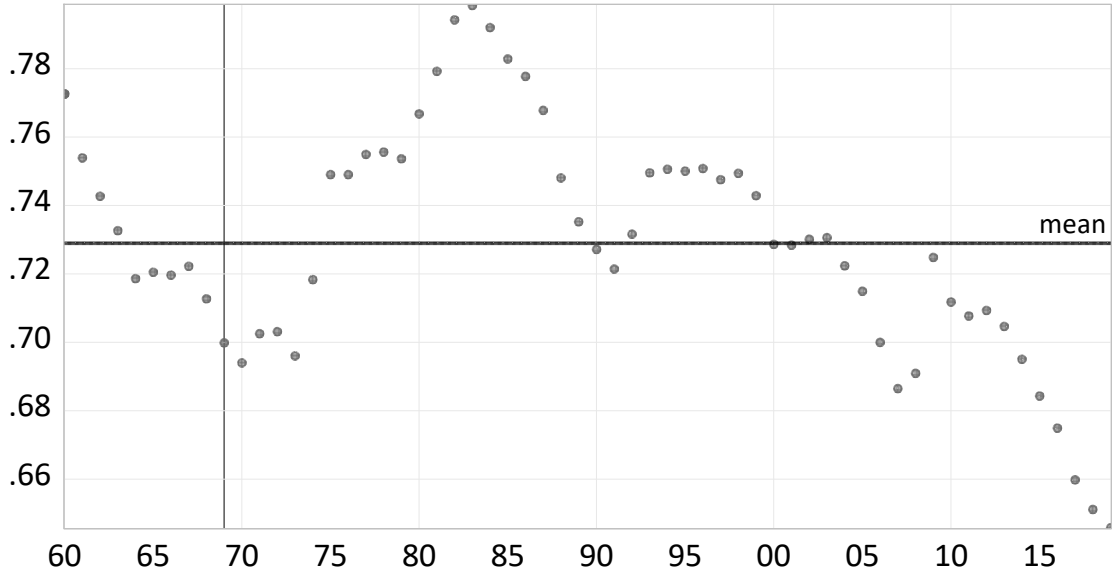
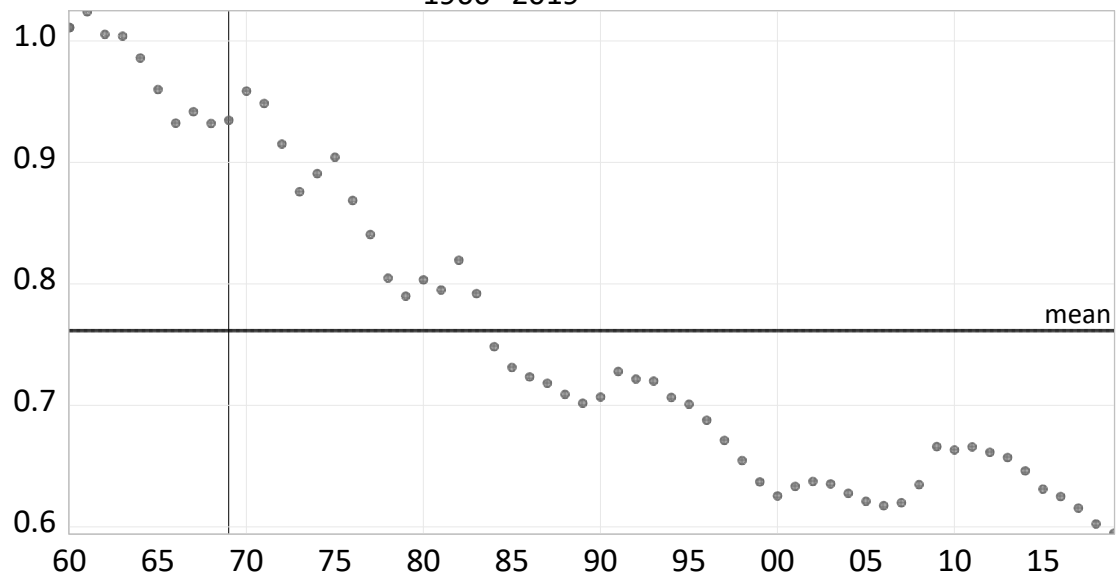


Figure 18
United States Public Capital/GDP
1960--2019



and let Y denote GDP for a given country. For the results in this section Y is actual GDP. It has not been adjusted for cyclical variation.

The IMF categorizes countries into 1) low income developing countries (LIDC), 2) emerging markets (EM), and 3) advanced economics (AE). Four aggregates have been used here. First, countries were excluded from all aggregates if they had any missing data from 1970 on. Countries were used if they had missing data only between 1960 and 1969, where they simply were not included in the aggregates for these years. This left 116 countries out of 194. For each year the values of the capital stock were summed to get an aggregate capital stock, and the values of GDP were summed to get an aggregate GDP value. The ratio of the aggregate capital stock to aggregate GDP was then computed. This was done for all countries, all LIDC countries, all EM countries, and all AE countries. The United States was excluded from all calculations.

Figures 14-17 contain the aggregate plots: Figure 14 is for all 116 countries; Figure 15 is for the LIDC countries; Figure 16 is for the EM countries; and Figure 17 is for the AE countries. Figure 14 shows that for the sum of all countries the ratio of public capital to GDP rose sharply between the mid 1970's and the mid 1980's. It was at an all time high in 2019. The aggregate is driven by the EM countries in Figure 16, where the ratio has a similar pattern over time. For both the LIDC countries in Figure 15 and the AE countries in Figure 17 the ratio has fallen since the mid 1980's.

The end of this paper contains plots for 14 individual countries. One question of interest for present purposes is whether these plots exhibit a pattern since 1970 similar to that for the United States in Figure 2, namely a roughly monotonic decline, ending roughly at the smallest value in the period. Six of the 14 plots end roughly at the smallest value: France, Germany, India, the Netherlands, Sweden, and the United Kingdom. For none of these does the decline begin in the early 1970's. For India the decline begins in the mid 1990's; for the United Kingdom the decline begins in the early 1980's; and for Germany and the Netherlands the decline begins in the mid 1980's. For France there is considerable fluctuation ending at a low point. For Sweden decline begins in the mid 1990's

Some of the plots are somewhat erratic, which could be partly due to measurement error. Of the 8 plots that did not end at roughly the smallest value, Italy, Mexico, Norway, and Spain ended in 2019 above the mean over the whole period, whereas Canada, China, Japan, and Korea ended at roughly the mean. Driving the decline of the ratio for all the AE countries in Figure 17 are the declines for France, Germany, the Netherlands, Sweden, and the United Kingdom. Offsetting this in part are the increases for Italy, Spain, and Norway.

Figure 18 is a plot for the United States using the IMF data on both the capital stock and GDP. (GDP in this case has not been adjusted for business cycles.) The plot is similar to that in Figure 2, which is encouraging regarding the accuracy of the data. The decline begins more or less in 1970, although there is some decline

in the 1960's. There are also more fluctuations going down. The ratios are also smaller using the IMF data. For example, in 1970 the ratio is 0.959 for IMF and 1.200 for BEA. In 2019 it is 0.595 for IMF and 0.677 for BEA. The decline between 1970 and 2019 is somewhat larger for BEA than for IMF: 0.523 versus 0.364. Probably the BEA data are more reliable.

4 Speculation

As noted in the Introduction, the infrastructure results combined with the results for the government budget deficit suggest that the United States became less future oriented, less concerned with future generations, beginning about 1970. In other words, the social discount rate seems to have increased. This change has persisted. The roughly monotonic decline in infrastructure as a percent of GDP since 1970 is remarkable, as is the persistence of the government budget deficit. This is not a pattern in other countries, so it may be something special about the United States.

More Plots

Before speculating, it will be useful to present a few more plots. First, it is interesting to know whether the stock of private capital has followed the same pattern as the stock of public infrastructure. Figure 19 plots the ratio of total private fixed assets as a percent of GDP.[6] This ratio has fallen, but beginning in 1980 rather than 1970. Also, the decline is smaller than that for nondefense infrastructure. The ratio fell by 17 percent between 1980 and 2023, which compares to a decline in nondefense infrastructure as a percent of GDP (N/Y) of 32 percent between 1970 and 2023. Private fixed assets do not include consumer durable goods. Figure 20

[6]Most of private fixed assets are nonresidential structures and residential. Total private fixed assets are taken from Table 1.2, line 3, in the FAA. These data are index numbers, and they were converted to 2017 dollars using the nominal value for 2017 from Table 1.1.

Figure 19

Private Fixed Assets/GDP

1950--2023

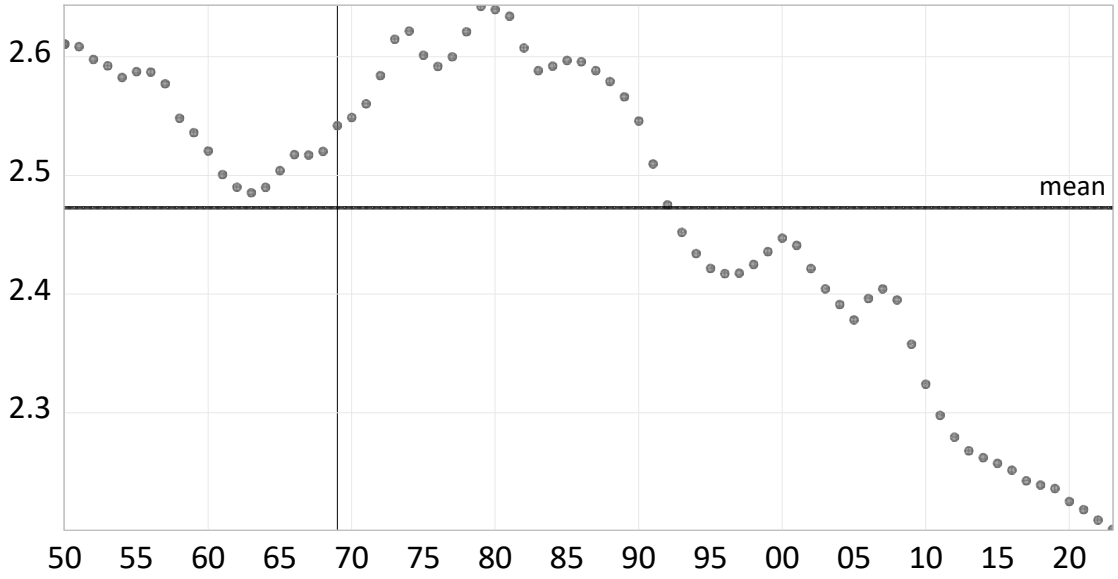


Figure 20

Stock of Durable Goods/GDP

1950--2023

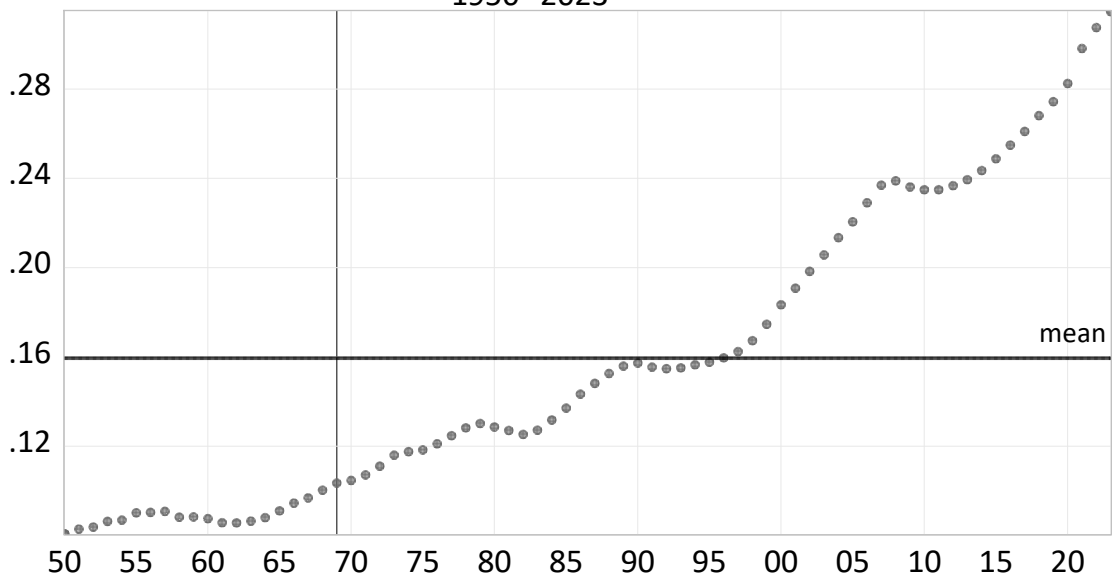


Figure 21

Price Deflator Government Nondefense Investment/GDP Deflator

1950--2023

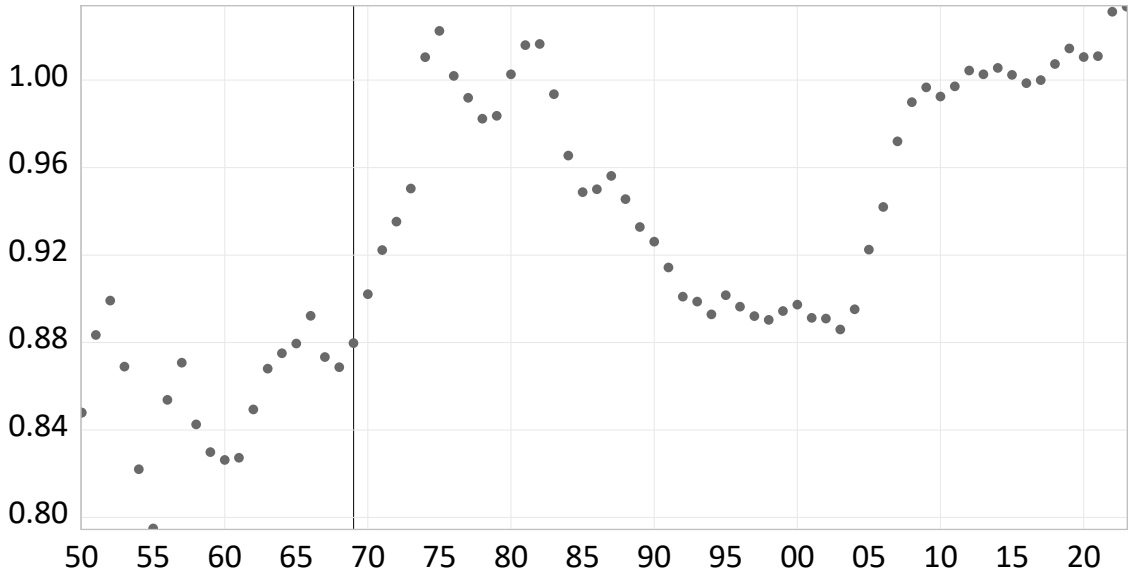
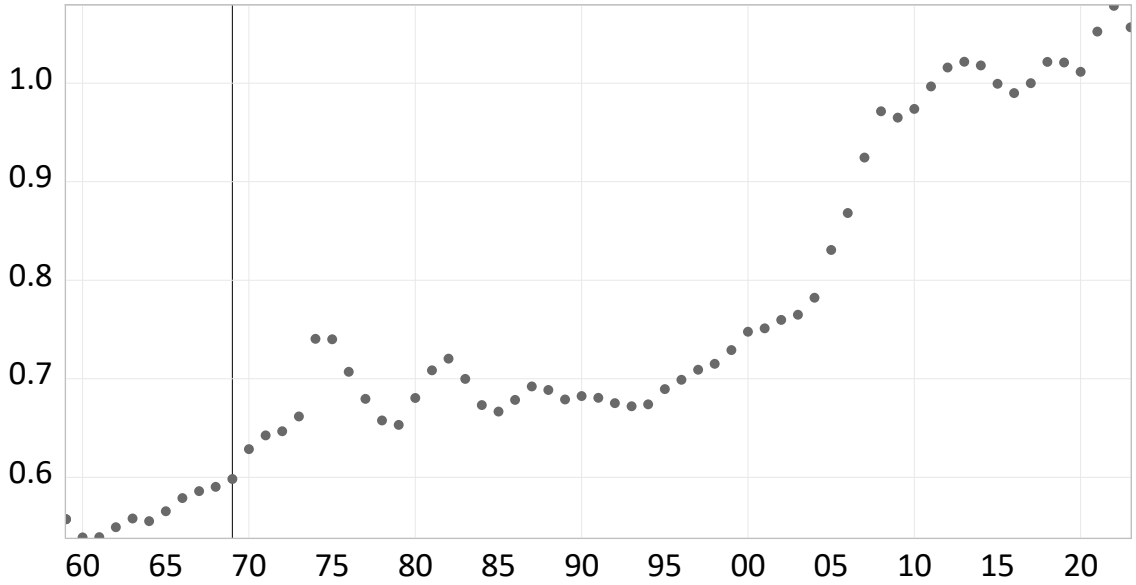


Figure 22

Government Transportation+ Price Deflator/GDP Deflator

1959--2023



plots the stock of durable goods as a percent of GDP.[7] This ratio has generally increased over time. Overall, there are large differences between the behavior of nondefense infrastructure and private fixed assets and consumer durable goods.

Second, there could be a price effect that would lead to a fall in N/Y over time. Figure 21 plots the ratio of the price deflator for government nondefense investment to the GDP deflator.[8] If this ratio steadily increased since 1970, this could be at least part of the explanation for the fall in N/Y because investment has become relative more expensive. Figure 21 shows a somewhat erratic ratio, rising to 1974, falling to 2003, rising to 2009, and then roughly flat. There thus does not seem to be a systematic price effect on N/Y.

It is also of interest to examine the government transportation component of government nondefense investment, since transportation investment is an important part of total investment. Figure 22 plots for the 1959-2023 period the government transportation+ deflator relative to the GDP deflator. These data are from the NIPA.[9] Transportation in the NIPA includes highways and streets, which is not true in the FAA, where the transportation component is small relative to the highways and streets component. The NIPA transportation component will be denoted transportation+ to distinguish it from the FAA transportation component. This price ratio was flat between 1970 and the mid 1990's, rose until 2013, and then has remained relatively flat since. More will be said about this below.

[7]The stock of durable goods is taken from Table 1.2, line 15, in the FAA. These data are index numbers, and they were converted to 2017 dollars using the nominal value for 2017 from Table 1.1.

[8]The price deflator for government nondefense investment was computed as follows. Nominal federal nondefense gross investment was taken from line 27 in Table 3.9.5 in the NIPA. Nominal state and local gross investment was taken from line 35 in the same table. These were summed to get the total. Quantity indices were taken from lines 27 and 35 in Table 3.9.3. The quantity indices were converted to 2017 dollars using the respective nominal values for 2017 from Table 3.9.5. These real values were then summed to get the total. The price deflator is then the ratio of the total nominal value to the total real value.

[9]The transportation+ deflator is the ratio of nominal government transportation consumption and investment from line 13 in BEA Table 3.15.5 to real government transportation consumption and investment from line 6 in Table 3.15.3, where the quantity indices in Table 3.15.3 are converted to real values using the nominal value in 2017 from Table 3.15.5.

Goolsbee and Syverson (2023) and D'Amico et sl. (2024) document that there was the beginning of a decrease in construction productivity around 1970. This is mostly private construction. D'Amico et al. (2024) argue that much of this decline is likely due to increased land use regulation. This is also discussed further below.

The Woodstock Generation

Can the fall in N/Y and the increase in the budget deficit be explained? What are the exogenous driving forces? One usually looks to changes in tastes or technology for exogenous forces. The years 1968, 1969, and 1970 had many noticeable events, and perhaps some of these permanently changed tastes. Here are some events that occurred around 1970:

1. Martin Luther King Jr. and Robert Kennedy were assassinated.
2. The early baby boomers moved into their 20's.
3. The beginning of the women's movement.
4. The draft, the bombing of Cambodia, unrest on college campuses.
5. "Turn on, tune in, drop out"—Timothy Leary.
6. Influence of Eastern religions on the counterculture.
7. Stonewall.
8. Woodstock.

It could be that the counterculture movement, triggered in large part by the Vietnam war and the draft, led to a change in tastes, in particular more negative views about the establishment and the government. This may have led to less interest in having the government do anything, like investing in the future. There may have been more interest in personal pleasures. This is certainly exemplified

by Leary's famous statement above. This could be considered an increase in the social discount rate.

Not all of this change should be considered selfish. The Eastern philosophies of selfless service were part of the movement, where perhaps added emphasis was placed on the present. The idea of valuing the present moment more than the distant future aligns with certain Hindu philosophical concepts, particularly the emphasis on living in the "now" and focusing on fulfilling one's Dharma (duty) in the current life.

Increased Environmental Concerns

Altshuler and Luberoff (2003) document the reaction in the 1970's to the urban renewal projects of the 1950's and 1960's. People became more energized in opposing projects that adversely affected existing neighborhoods and the like. Brooks and Liscow (2023) label this an increase in the "citizen voice," an increased opportunity for citizens to influence government decisions. D'Amico et al. (2024) document an increase in land use regulations at about this time. These regulations affected mostly private construction, but it is likely that some pubic investment was affected. Glaeser and Ponzetto (2018) develop a theoretical model that explains the decline in mega-projects stressed by Altshuler and Luberoff (2003) because of increasingly more organized and educated urban voters. This theory is consistent with the view of Brooks and Liscow (2023) of an increasing citizen voice. An important consequence of the increased citizen voice was the passage in 1970 of the US Clean Air Act and the establishment of the EPA.[10]

The papers just cited point out the large increase in costs of infrastructure projects beginning around 1970. Many more procedures had to be followed for any one project and usually environmental protections had to be added. It is interesting that these costs are not reflected in the relative prices in Figures 21 and

[10]See Currie and Walker (2019) and Schmalensee and Stavins (2019) for a history.

22. The costs appear to be because of more elaborate projects rather than because of higher relative prices of infrastructure investment goods.

Increasing concern with the environment is, of course, not an increase in the social discount rate; if anything, it is the opposite. But in this case it has the consequence of less infrastructure investment.

Conclusion

Although none of this can be tested, a consistent story is the following. The disillusionment with the government, led in large part by the Vietnam war, led to a counterculture movement focusing more on the present and less on government decisions about the future, including less concern about government decisions to increase the debt burden on future generations by running large deficits. In addition, there was at the same time an increased concern about the environment, about the environmental costs of mega-projects, which led to less infrastructure spending.

Although the increased environmental concern undoubtedly led to less infrastructure spending, this increased concern does not explain the increase in the government budget deficit. Explaining this requires the social discount rate story.

In "Subterranean Homesick Blues" Bob Dylan is on the pavement thinking about the government, but perhaps not positively!

References

[1] Altshuler, Alan, and David Luberoff, 2003, *Mega-Projects The Changing Politics of Urban Public Investment*, The Brookings Institution.

[2] Aschauer, David Alan, 1989, "Is Public Expenditure Productive," *Journal of Monetary Economics*, 23, 177-200.

[3] Brooks, Leah, and Zacharay Liscow, 2023, "Infrastructure Costs," *American Economic Journal: Applied Economics*, 15(2), 1–30.

[4] Bom, Pedro R.D., and Jenny E. Ligthart, 2014, "What Have We Learned From Three Decades of Research on the Productivity of Public Capital?" *Journal of Economic Surveys*, 28, 889-916.

[5] Calderón, César, Enrique Moral-Benito, and Luis Servén, 2015, "Is Infrastructure Capital Productive? A Dynamic Heterogeneous Approach," *Journal of Applied Econometrics*, 30, 177-198.

[6] Currie, Janet, and Reed Walker, 2019, "What Do Economists Have to Say about the Clean Air Act 50 Years after the Establishment of the Environmental Protection Agency?" *Journal of Economic Perspectives*, 33, 3-26.

[7] Leonardo D'Amico, Leonardo, Edward L. Glaeser, Joseph Gyourko, William R. Kerr, and Giacomo A.M. Ponzetto, 2024, "Why has Construction Productivity Stagnated? The Role of Land-Use Regulation, NBER Working Paper 33188.

[8] Ford, Robert, and Pierre Poret, 1991, "Infrastructure and Private-Sector Productivity," OECD Economics Department Working Papers No. 91, January.

[9] Fraumeni, Barbara M. and Robert Kornfeld, 2024, "Constructing BEA Highways and Streets Net Wealth Stocks with Detailed Types of Investment and Engineering-Based Estimates of Depreciation," NBER Working Paper 32753.

[10] Glaeser, Edward I., and Glacomo A.M. Ponzetto, 2018, "The Political Economy of Transportation Investment," *Econonics of Transportation*, 13, 4-26.

[11] Goolsbee, Austan, and Chad Syverson, 2023, "The Strange and Awful Path of Productivity in the U.S. Construction Sector," NBER Working Paper 30845.

[12] Mehrotra, Neil, Matthew A. Turner, and Juan Pablo Uribe, 2024, "Does the US Have an Infrastructure Cost Problem? Evidence from the Interstate Highway System," *Journal of Urban Economics*, 143, 1–19.

[13] Munnell, Alicia H., 1992, "Infrastructure Investment and Economic Growth," *Journal of Economic Perspectives*, 6, 189-198.

[14] Schmalensee, Richard, and Robert N. Stavins, 2019, "Policy Evolution under the Clean Air Act," *Journal of Economic Perspectives*, 33, 27-50.

[15] U.S. Department of Commerce, Bureau of Economic Analysis, 2003, "Fixed Assets and Consumer Durable Goods in the United States, 1925-97," Washington DC: U.S. Government Printing Office, September.

Figure A1
Canada Public Capital/GDP
1960--2019

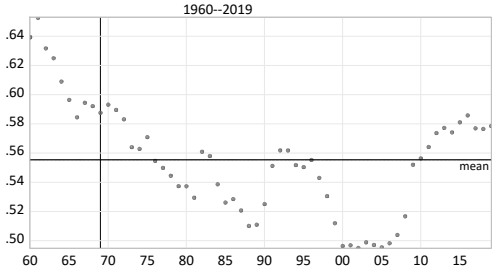


Figure A2
China Public Capital/GDP
1960--2019

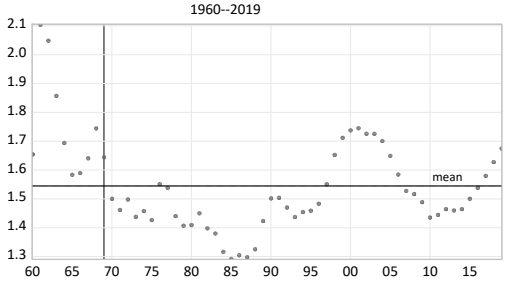


Figure A3
France Public Capital/GDP
1960--2019

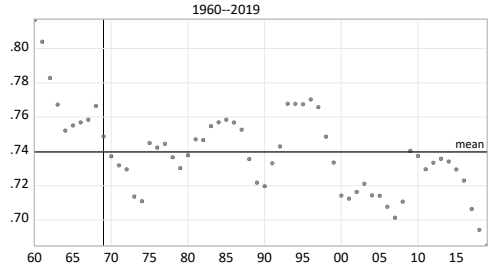


Figure A4
Germany Public Capital/GDP
1960--2019

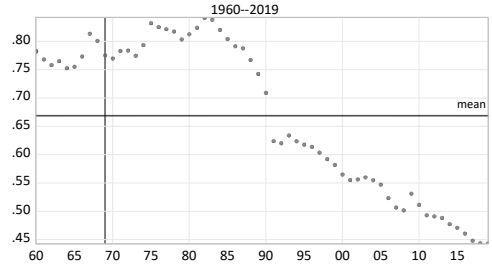


Figure A5
India Public Capital/GDP
1960--2019

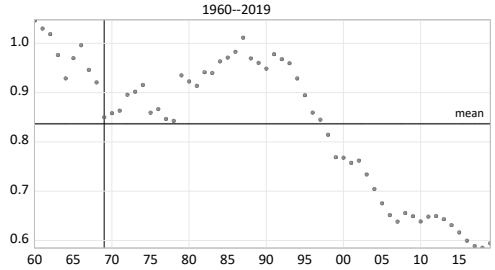


Figure A6
Italy Public Capital/GDP
1960--2019

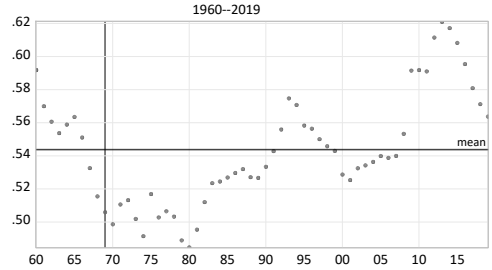


Figure A7
Japan Public Capital/GDP
1960--2019

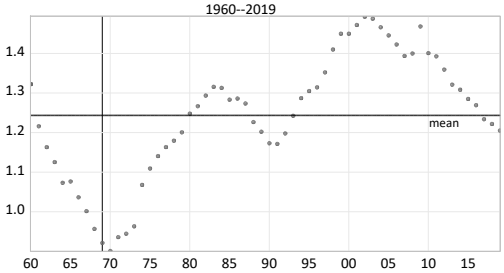


Figure A8
Korea Public Capital/GDP
1960--2019

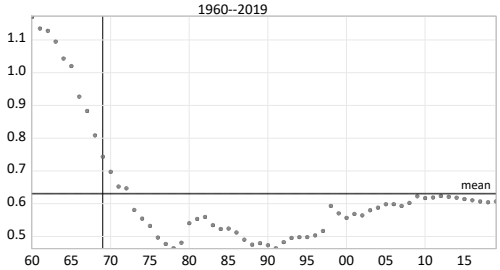


Figure A9
Mexico Public Capital/GDP
1960--2019

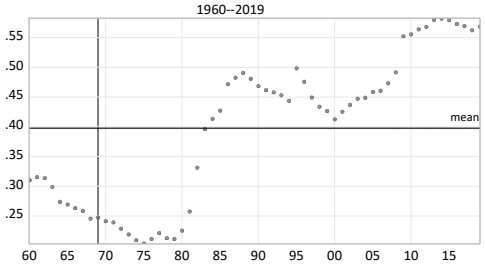


Figure A10
The Netherlands Public Capital/GDP
1960--2019

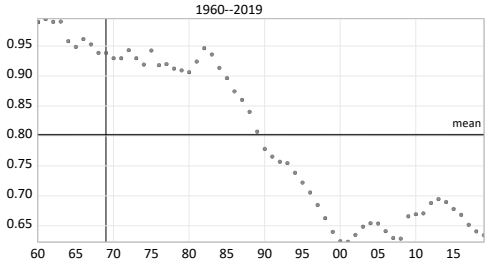


Figure A11
Norway Public Capital/GDP
1960--2019

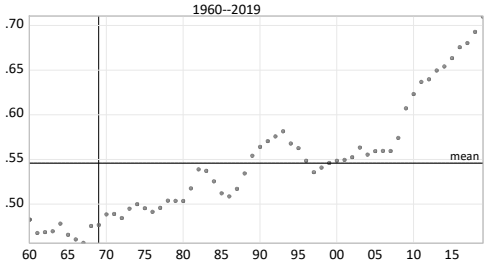


Figure A12
Spain Public Capital/GDP
1960--2019

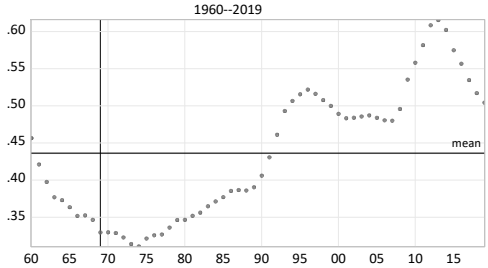


Figure A13
Sweden Public Capital/GDP
1960--2019

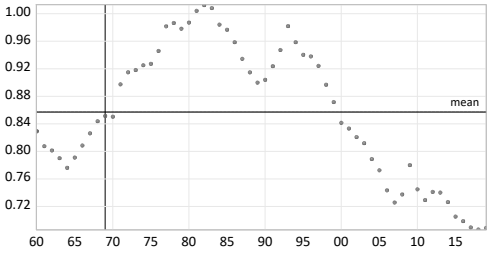


Figure A14
United Kingdom Public Capital/GDP
1960--2019