

Long-Run Determinants of Economic Growth: Putterman and Weil Revisited

Jason Briggeman
Austin Community College

What's at issue?

- History obviously matters for current GDP. A literature on 'persistence' asks how much 'deep' history matters.
- Putterman and Weil (2010 *QJE*) say that “ancestry-adjusted state history” from 1–1500 CE has a “surprisingly” strong linear effect on year-2000 GDP.
- Borcan, Olsson, and Putterman (2018 *J Econ Growth*) say that state history from 3500 BCE to 1500 CE has a “hump-shaped” effect on year-2000 GDP, and this is owed to the inclusion of the years 3500–1 BCE.
- I find, instead: The linear effect of ancestry-adjusted state history 1–1500 CE is not strong, and the inclusion of 3500–1 BCE is not needed to find a hump-shaped effect.

Origin story for this paper

- I saw a scatterplot of Putterman and Weil's data that was obviously missing North Korea, which piqued my interest.
- I later found that needlessly missing data caused 38 countries to be dropped from Putterman and Weil's main controlled regression (n=111).
- Correcting and updating the data causes the t-ratio on their key independent variable, ancestry-adjusted state history, in that controlled regression to fall from 2.93 to 2.75.

Efforts to learn about persistence

Two working papers by Kelly (2019; 2020) have posed an attention-getting challenge to findings on persistence.

The basis for Kelly's challenge is spatial autocorrelation, and he offers both sophisticated and easy methods to address that concern.

Kelly shows that the Putterman and Weil (2010) *uncontrolled* regression is fairly likely to have an inflated coefficient.

But, Putterman and Weil's controlled regression—with a t-ratio on the key variable of +2.75—has at least one control similar to those advocated by Kelly.

What specifications should we consider?

Caplan (2016): We should weight by current population.

Borcan, Olsson, and Putterman (2018): Ideally the unit of analysis would be “equal-sized grid cells” of land.

Chanda, Cook, and Putterman (2014): We should consider inhabited land area and not uninhabited land area.

Putterman and Cinyabuguma (2011): If Africa drives a world result, we should see if the result holds *within* Africa.

Chanda, Cook, and Putterman (2014): We should make sure the particular year chosen to represent current levels of development doesn't matter.

Some specifications I provide

Weighting by current population

Weighting by land area

Weighting by arable land area

Without sub-Saharan African countries, and
With only sub-Saharan African countries

$\ln(\text{GDP per capita in 1960})$ as the dependent variable

T-ratios for ancestry-adjusted state history, with Putterman and Weil's controls, and...

...weighting by current population: -0.55

...weighting by land area: +3.38

...weighting by arable land area: +2.24

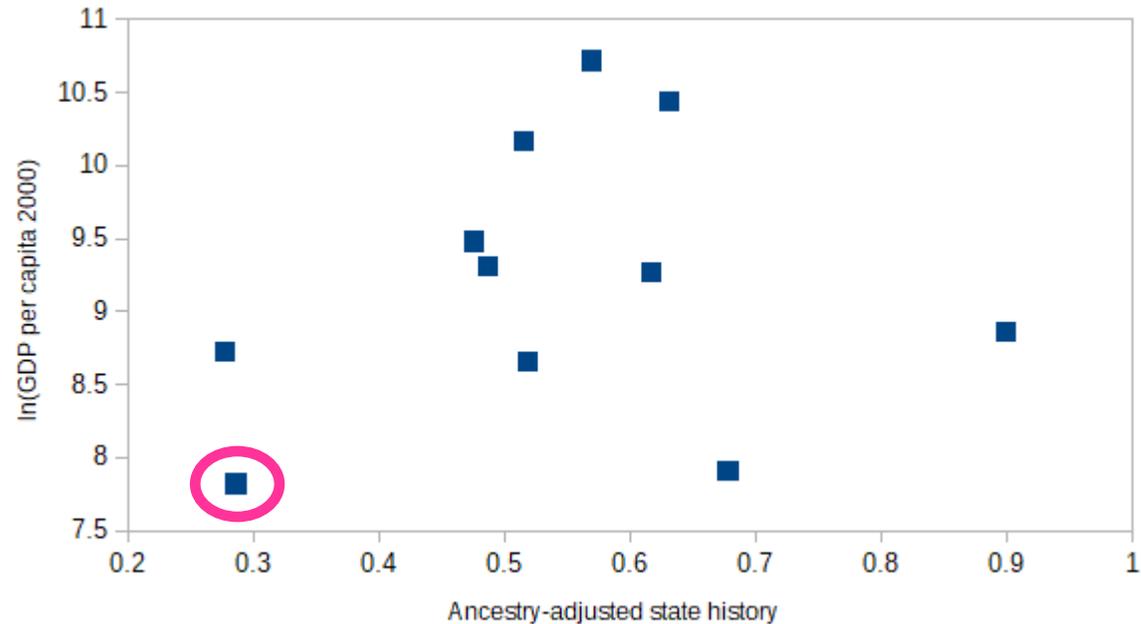
...without sub-Saharan African countries: +1.88

...sub-Saharan African countries only: +0.03

...ln(GDP per capita in 1960) as the dependent variable: +2.11

Today's division of the world into countries drives quite a lot of Putterman and Weil's result

Scatterplot of the 11 world regions defined in Putterman and Weil (2010):



“If factors alleged to account for the African difference in global samples perform quite differently within Africa, their relevance to African and other development policy makers would be called into question” (Cinyabuguma and Putterman 2011, 219).

No evidence that state history from before 2,000 years ago makes a qualitative difference

- Borcan, Olsson, and Putterman (2018, 2) claim there is a “hump-shaped” relationship between deep history and present GDP per capita, and they say they discovered the hump-shaped relationship only because their new study looked 3,500 years further back in time: “We show that the relationship between state history and current income per capita across countries is hump-shaped rather than linear, and that this is due to the inclusion of state experience before the Common Era.”
- But the relationship for *ancestry-adjusted* state history—and they always say that the ancestry adjustment is crucial—is hump-shaped in an uncontrolled regression using the original Putterman and Weil (2010) data, and with the corrected data it’s hump-shaped in the controlled regression as well. So the pre-Common Era history ***doesn’t*** matter.

If there's a "hump-shaped" effect, what does that mean for what we should think?

Effect size at different values of x
when $y = \beta_0 + 8.08x - 8.51x^2$:

Value of x	Effect on y
0	0.00
0.2	1.28
0.4	1.87
0.6	1.78
0.8	1.02
1	-0.43

If we take the idea of a hump-shaped effect seriously, it means:

- The highest-possible state history value (1) is worse for GDP than the lowest-possible state history value (0) is.
- The weighted third-quartile state history value (.687) is worse for GDP than the weighted first-quartile state history value (.375) is.

If there's a “hump-shaped” effect, what does that mean for what we should think?

“An index of state antiquity was developed by Brown University Professor of Economics Louis Putterman and then Brown University undergraduate Valerie Bockstette circa 1999–2000 to test the proposition that present-day countries that had been the site of nation-states, kingdoms or empires over longer spans of history have achieved more rapid economic development in recent decades.” (Putterman 2017)

“We outline a theoretical framework where accumulated state experience increases aggregate productivity in individual countries but where newer or relatively inexperienced states can reach a higher productivity maximum by learning from the experience of older states.” (Borcan, Olsson, and Putterman 2018)