NET 2021 Power Round

Milgrom Division: Macroeconomics [ANSWER KEY]

April 2021

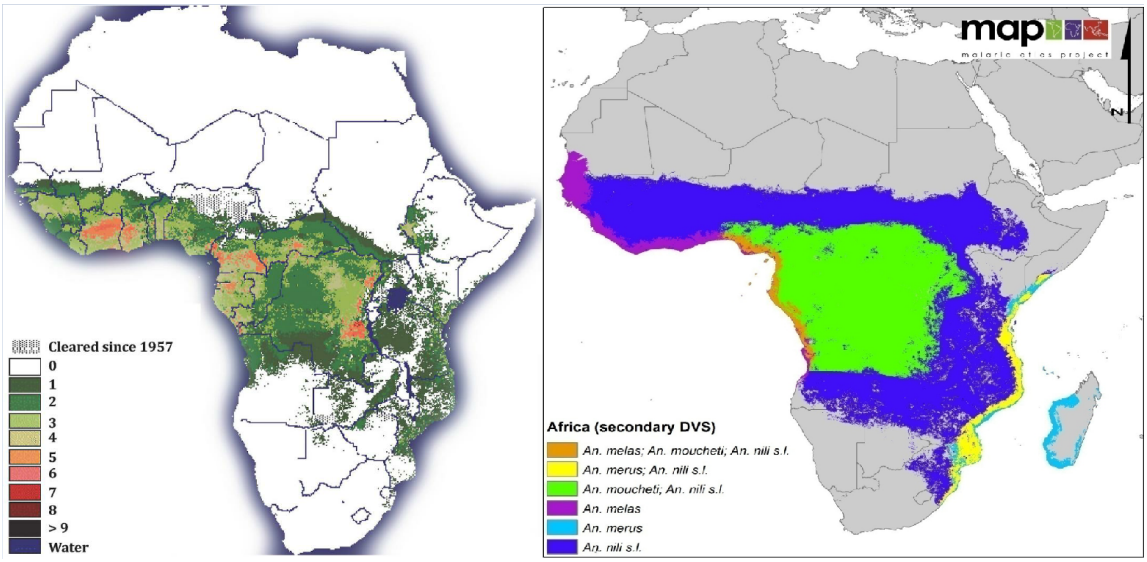
Problem 1: The Curse of the Tropics

The redacted studies are "The Effect of the TseTse Fly on African Development" (2015) by Marcella Alsa and "The Colonial Origins of Comparative Development: An Empirical Investigation" by Daron Acemoglu, Simon Johnson, and James A. Robinson.

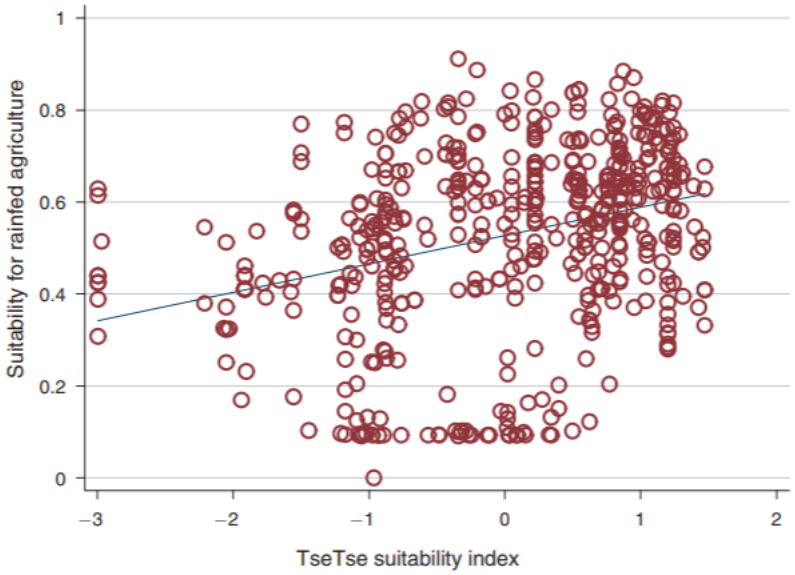
Part A We would expect a negative correlation between these measures, because the TseTse fly will negatively impact both human and physical capital with its spreading of parasites. Ceteris paribus, this will lead to worse economic and health outcomes for countries who have to deal with the TseTse flies - namely, those with high TSIs - and better outcomes for those countries who do not have to deal with the TseTse flies.

1 point for saying negative, 1 point for explaining

Part B There are multiple reasonable correct answers to this question - we will give two. First, we might expect OVB which makes our observed correlation look too strong because the same conditions that allow TseTse flies to flourish also allow other disease-bearing insects to flourish. Ceteris paribus, this would cause relatively worse outcomes in high-TSI areas and relatively better outcomes in low-TSI areas, disregarding the impact of the TseTse flies themselves. Here's a map of the TseTse fly's range (left) and the mosquito's range (right) in Africa, as an example (sources: Food and Agriculture Organization of the United Nations, *A global map of dominant malaria vectors* (Sinka et al., 2012)):



However, we might also predict OVB which makes our observed correlation look too weak from the TSI's relationship with crop fertility - the described conditions for TseTse flies to flourish also allow many crops to grow well. Ceteris paribus, this would cause relatively better outcomes in high-TSI areas and relatively worse outcomes in low-TSI areas, disregarding the impact of the TseTse flies themselves. Here's a graph from the source paper:



1 point for a good example of OVB, 1 point for explanation, 1 point for the correct direction of bias. Note: obviously, you do not need data to support your answer, we've just given it here for completeness.

Part C Notice that, regardless of what the TSI is in a region, TseTse flies only ever actually live in Africa. Therefore, we could compare the difference in outcomes between regions of high and low TSI values in Africa with the difference in outcomes between regions of high and low TSI values outside of Africa to get a better estimate of the causal effect of the presence of TseTse flies on these economic outcomes. This is called a "difference-in-differences" or "fixed effects" model - check out question 1 on the Wilson Macro exam to learn more!

3 points for an exactly correct response, 2 points for recognizing that the comparison is inside/outside Africa but having an inaccurate method for comparison (i.e. only comparing high TSI in Africa to high TSI outside of Africa), 1 point for an answer that sort of gets at the right answer but is more flawed (i.e. comparing Africa to non-Africa with no mention of TSI or comparing high TSI to low TSI everywhere)

Part D There are many correct answers here - we will give one, but with two interpretations. One example of a well functioning institution in Evanston, Illinois is the health care system. Emergency services, hospitals, and other healthcare services are widely available, and other public health factors (clean air, drinking water, indoor plumbing) are essentially taken for granted. However, this same system could be considered poorly functioning under a different lens. Even if these services are widely *available*, they may not be widely *affordable* or *accessible* for impoverished Evanstonians due to the lack of a universal health care system in the United States, leading to worse health care outcomes than similarly-developed peer countries.

1 point for naming an institution, 2 points for explanation for why it functions well/poorly

Part E We would expect that the "Neo-Europes" would have more stable political institutions in the future. There are many correct explanations as to why - you probably got credit for this.

1 point for correctly identifying the more stable structure, 1 point for explaining.

Part F There are multiple possible correct answers to this question - we will give one. Notice that, in the Neo-Europes, the native population was subjected to terrible and cruel treatment by the colonizers, but the land was generally kept intact and the settlers at least in part replaced the population loss incurred by the brutalization of the native peoples. However, in extractive states, similarly brutal methods were employed by the colonizers, but with less regard for the long term health of the land and without leaving settlers behind. This means countries which were once extractive states were at a labor and capital disadvantage

when the age of colonization ended - we would expect this to be pretty well linked to modern day economic outcomes, but not necessarily as a result of different strengths of sociopolitical institutions between the age of colonization and now (you could even argue for reverse causality in this regard - the "headstart" that the Neo-Europes had reinforced the good institutions that they ended up with). This causes our observed negative correlation between being in a more extractive colonial state and modern day economic outcomes to be too strong.
2 points for OVB/interpretation, 1 point for direction
Part G Many many many possible answers here. 1 point for a reasonable cause, 1 point for a good explanation, and 1 point for categorization.

Problem 2: Money Printers and Inflation (12 Points)

We can relate money supply to the aggregate economy with the equation: $MV = PY$, where:

(1) M is the amount of money in the economy

(2) V is the velocity of money

(3) P is the aggregate price level

(4) Y is the real value of goods and services traded

Suppose that in Duckville, we have a money supply M of \$160 and a velocity V of 3. Assume that lemonade production is the only economic activity.

Part A MV = PY and PY is the nominal GDP, which is $160 * 3 = 480$. 1 point for the correct number.

Part B Divide nominal GDP by the price level for lemonades. $480/2.5 = 192$ lemonades. 1 point for the correct number.

Part C If the number of lemonade purchases doubles, the nominal output doubles to 960. The money supply is constant, so $V = 960/160 = 6$. 1 point for the correct nominal output, 1 point for the correct velocity of money.

Part D If lemonade now sells for \$4.5, dividing nominal output by the new price level gives us $960/4.5 = 213$ lemonades. 1 point for the correct number(computing to the fraction of a lemonade is fine).

Part E There is no significant association between money growth and real output growth, so we can eliminate the variable for real GDP growth ($g = 0$). Moving μ to the left hand side yields $\mu = \pi - \%\Delta V$. 2 points for pointing out a 0 or insignificant association between the two variables. 2 points for correct expression(notation not that important, as long as the response kills the real output variable).

Part F The money supply M grows by 56.25%, so m is 0.5625. $\%\Delta V$ is 0, g is 0, so π is also 56.25% . New price level: \$3.91 per lemonade. 1 point for the correct m. 1 point for indicating that the change in real output and change and velocity are 0 or writing out the expression $\pi = 56.25\%$. 1 point for the final price \$3.91 per lemonade.

Problem 3: Better Everywhere but still Worse Somewhere (11 Points)

Part A Maputo can produce 200 warp and 300 garp. Lesotho can produce 150 warp and 120 garp. 1 point for stating that Maputo has the absolute advantage in producing both. 1 point for a reasonable explanation.

Part B Maputo foregoes 1.5 garp to produce a warp. Lesotho forgoes 0.8 garp to produce a warp. Maputo thus has comparative advantage in producing garp, and Lesotho has comparative advantage in producing warp. 1 point for Maputo's comparative advantage in garp and an explanation. 1 point for Lesotho's comparative advantage in warp and an explanation(if correct countries but no rationale, give half credit).

Part C Following the comparative advantage analysis, we know that Maputo chooses to specialize in producing garp. Using the labor endowments in the table, we can compute that Maputo produces $300/1 = 300$ units. It exports 100 units to Lesotho and keeps the rest 200 for itself. Lesotho chooses to produce warp, and it makes $600/4 = 150$ units. It exports 100 units and keeps the rest 50 for itself. 2 points for computing the total production volumes for each country, which is 300 garp and 150 warp. 2 points for the correct import/export breakdown for each country.

Free Trade Consumption	Maputo	Lesotho
Warp	100	50
Garp	200	100

Part D 1 point for restating the free trade numbers. 2 points for a simple explanation. Examples include: benefits of trade can be seen from increased consumption of warp and garp for both countries compared to their levels at autarky. The inputs required to produce each country's items consumed in free trade would be unfeasible for the country to produce with their own labor endowments.