

ECON 133 “Global Inequality and Growth”  
Final 2, May 18

**Student name:**

**Student ID number:**

*You have 3 hours*

Instruction: Write your answers in the boxes: nothing outside of the boxes will be graded. You can use the computer or print the assignment and scan your answers. **If writing in word, don't expand the boxes!**

If using word to answer the questions you can either use the equation editor (click insert -> equation) or simply use computer typography: e.g. you can write  $s_t \cdot \frac{Y_t}{W_t}$  as s\_t\*(Y\_t/W\_t)

**Exercise 1: True or false statements (12 points)**

a) *True or false: The goal of government is to maximize tax revenue. (2 points)*

**False:** *The goal of a benevolent dictator will be to maximize the social welfare function they believe in. A democratic government will often try to maximize voter satisfaction. Other potential government goal functions exists, but these will rarely large tax revenue as an end itself. Instead governments will have to balance the need for tax revenue to fund public spending and redistribution, with the distortive effects of (too high) taxation.*

b) *True or false: The corporate tax disincentivizes investment by lowering the investor return. Therefore, the optimal corporate tax rate is zero. (2 points)*

**False:** *The key reason to tax corporate profits is to avoid a tax arbitrage that allows business owners to camouflage labor income as corporate income. Furthermore, absent a corporate tax, the shareholders can postpone dividend taxation indefinitely by not paying out dividends (such as Amazon, Google, Apple etc does). In practice this can allow extremely wealthy individuals to have very low effective tax rates.*

*Main situations where the K/L frontier is fuzzy:*

- *Business owners can decide how much they get paid in wages vs. dividends*
- *Freelancers (journalists, consultants...) and self-employed (doctors, lawyers, etc.) can incorporate*

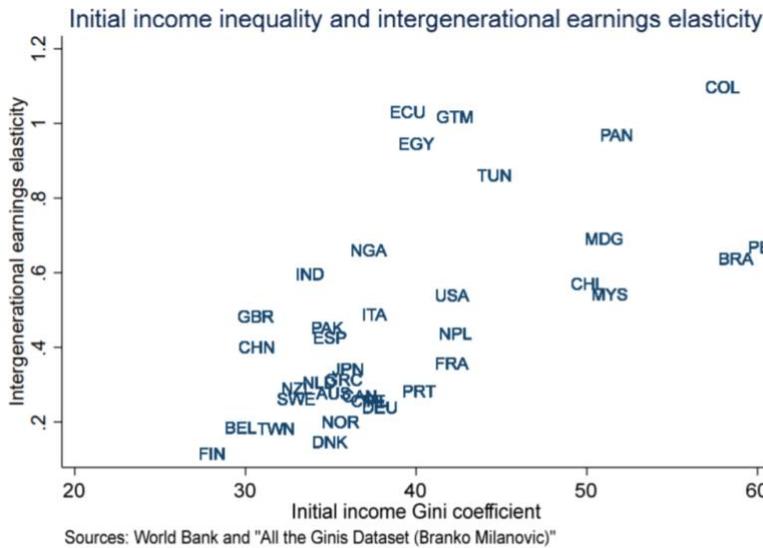
*(Mentioning either point or another valid point will yield full credit for students)*

c) *True or false: Suppose there are no behavioral responses to labor income taxation and the social planner maximizes a Rawlsian social welfare function. The optimal labor income tax rate is in this case equal to 100%. (2 points)*

**True:** *The Rawlsian social welfare function aims to maximize the welfare of the individual that is worse off. Therefore, absent any behavioral effects to taxation, the Rawlsian optimum is 100% equity, which can be achieved by 100% taxation.*

d) *True or false: Highly unequal countries are usually countries where an individual's effort predominantly determines their economic outcomes. That is, highly unequal countries usually have low intergenerational inequality". (2 points)*

**False:** *As an empirical observation, there are no highly unequal countries that do not also have high intergenerational inequality. Therefore highly unequal countries tend to be countries where parents' income level are more important than in highly equal countries.*



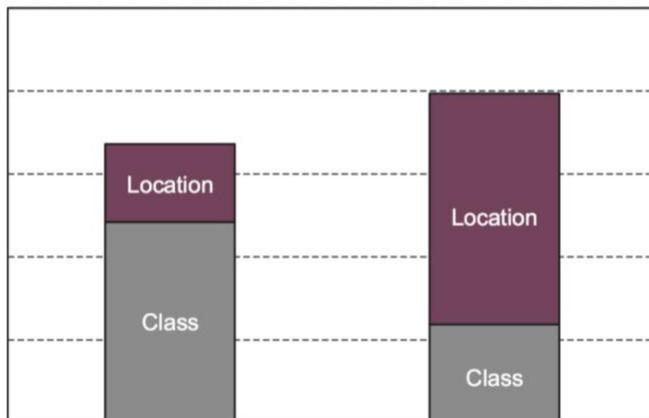
- e) *True or false: Most projections point to lower overall economic growth (g) in the 21<sup>st</sup> century due to lower population growth (n), scarcity of resources and lower productivity growth (h). Everything else equal, this will imply an increase in the global wealth-to-income ratio. (2 points)*

**True:** The long-run wealth-to-income ratio can be expressed as  $s/g$ , where  $s$  is the net-of-depreciation savings rate and  $g$  is the overall economic growth rate. If  $g$  falls, without a corresponding increase in  $s$ , then the wealth-to-income ratio will increase in the long run.

- f) *True or false: The largest determinant of income today is not class (measured by within country inequality) but instead location (measured by between country inequality). (2 points)*

**True:** This is an empirical observation. Below citing Milanovic (2013)

**Figure 6.** A non-Marxian world: level and composition of global inequality in the 19<sup>th</sup> century and around 2000 (measured by the Theil index).



Source: Milanovic (2013)

## Exercise 2: Wealth (10 points)

- a) *Governments across the world have seen a decline in public wealth as a share of national income – why is that? And is it important? (1 point)*

*Two main reasons: privatization (particular in ex-communist countries) whilst the story of rich countries have been an increase in public debt (US, Europe)*

*It's important because it determines the amount of economic resources controlled by the government relative to the private sector. Furthermore, it has implications for wealth inequality, as private wealth is very unequally owned whereas public wealth is in principle owned equally by all citizens.*

- b) *How can economists measure wealth inequality? (2 points)*

*Three main methods:*

*1. Estate tax multiplier method*

*Start with wealth-at-death reported on estate tax returns. Then compute mortality rate by age and gender (and income!). Finally, weight wealth-at-death by inverse of mortality rate*

*2. Capitalization of investment income*

*Start with capital income reported in personal income tax returns. Then compute rate of return on each asset class. Multiply capital income by inverse of rate of return (correct for differences by wealth percentile)*

*3. Survey data with top-end correction*

*Use SCF survey. Information from the very top can be obtained from namedlists of rich individuals, e.g., Forbes*

*(Each bullet mentioned will be credited 1 point, but no more than 2 points in total)*

c) Describe how  $r > g$  may impact wealth inequality. (1 points)

*It increases with wealth concentration (under reasonable assumptions). Example: if  $g = 1$  and  $r = 4\%$ , then a person whose income only derives from wealth  $K$  (hence has income  $rK$ ) needs to save only  $g/r=25\%$  for her wealth to grow as fast as the economy*

*(a formal explanation can also be given by students)*

d) What are the other long-run factors that impact wealth inequality? (2 points)

*Long-run wealth inequality can be described as: share of wealth = share of income · relative savings rate (1 point for this part)*

*The other factors driving wealth inequality are therefore: Savings rate inequality (which is in itself a product of income inequality), Income inequality (host of reasons for this), and inheritance (that allows wealth accumulation across generations). (1 point for this part)*

e) Individual  $i$  wealth accumulation at time  $t + 1$  can always be written:

$$W_{t+1}^i = (1 + q_t^i) \cdot (W_t^i + s_t^i Y_t^i)$$

Where  $W_t^i$  is wealth,  $Y_t^i$  is income,  $s_t^i$  is net savings rate,

$1 + q_t^i$  is rate of capital gains (price effect) in year  $t$

Write the expression for the long-term steady-state top wealth share (no need to derive).  
How does  $q_t^i$  enter the expression? (2 points)

In a long-run steady-state without price effect, then:

$$sh_W^P = sh_Y^P \cdot \frac{s^P}{s}$$

i.e. share of wealth = share of income  $\cdot$  relative savings rate.

$q_t^i$  does not enter formula as price effects will average zero in the long run.

f) Is inherited wealth a meaningful share of total wealth today in the United States? Why does that matter when deciding whether to tax capital income? (2 points)

Very meaningful! The best available estimates is that 60% of wealth in the US results from inheritance (Alvaredo, Garbinti and Piketty; 2015). This matters a lot when designing tax policy: if wealth inequality was 100% the outcome of labor income inequality, there would be far less reason to tax capital income and instead more reason to focus on the inequality driver of labor income.

**Exercise 3: Labor institutions and wage inequality (10 points)**

a) *What considerations should a government have when setting a minimum wage? (1 point)*

*The basic considerations are two: what is the impact on employment vs. the impact on labor income at the bottom (full point for students for mentioning this)*

*More sophisticated considerations are: who pays the minimum wage increase (consumers, shareholders, managers in the firm etc); do we have reason to believe that the marginal product of labor is above the current wage (e.g. does a monopsony exist); and will a minimum wage increase the productivity of the job applicants.*

b) *How has the minimum wage impacted racial inequalities in the United States? (1 point)*

*Derenoncourt and Montialoux (2019) find that the 1966 extension of the minimum wage can explain more than 20% of the reduction in the racial earnings and income gap during the Civil Rights Era.*

c) *Union membership has been in free fall in the US since 1980. What are the issues confronting unions in the United States? (2 points)*

*US unions have two main issues: 1) instead of bargaining for floor wages, the bargain for the entire wage scale, leading to heavy opposition from workers feeling they are “dragged down” by the union. This differs from successful Scandinavian union practices 2) US unions operate at a firm basis opposed to on an economy wide or sector basis. This allows non-unionized firms to outcompete unionized firms. This again differs from Scandinavia, France etc.*

*Mentioning either point will give full credit for students*

d) *What are the benefits/disadvantages of having unions set minimum (floor) wages vs government set minimum wages? (1 point)*

*On one hand unions can take more local considerations into account and work more closely with the firm to ensure a flexible and immediate response to crisis etc. Unions can also ensure to have differing floor wages for different types of jobs. On the other hand, government can ensure the minimum wage covers all.*

e) *How do trends such as globalization and technology affect wage inequality? (2 points)*

*Complements educated workers who excel in abstract tasks that are at present difficult to automate or outsource - but devalues the skills of workers → drops in non-college employment opportunities in production, clerical, and administrative support positions stemming from automation → fall in real wage of low-educated workers:*

- -22% over 1980-2012 for high school dropouts males*
- -11% for high school graduate*
- Fall of labor force participation*

f) *Since 1980 the US has seen a dramatic increase in wage inequality compared to continental Europe. Was this an unavoidable consequence of globalization and technology? (1 point)*

*The US skill premium has increased more than most other developed countries, but the US has not experienced more globalization and automation than other developed countries. Therefore, globalization and technology does not unavoidably lead to the same levels of wage inequality as in the US.*

*g) The average income in the Denmark in 2016 was \$60K. The Bottom 50% share was 20%, the top 10% share was 30% and the top 1% share was 10%. What is the average income of each group? (2 points)*

*The Bottom 50% Average Income =  $20\%/50\%*60K=0.4*60K=24K$*

*The Top 10% Average Income =  $30\%/10\%*60K=120K$*

*The Top 1% Average income =  $10\%/1\%*60K=600K$*

*(2/3 points for each correct computation for students)*

#### Exercise 4: Global development (10 points)

a) *Have the last 30 years of fighting global poverty been a success? (1 point)*

*Insanely so! We have gone from nearly 2 billion people living in extreme poverty to half a billion!*

b) *Where do the extremely poor live today compared to in 1980 – and how does that impact the role of development aid? (1 point)*

*In 1980 most of the world's extremely poor lived in low-income countries. Today the majority live in middle-income countries. This implies that where development aid used to focus on lifting entire countries out of poverty, the focus is shifting towards fighting within-country inequality in middle-income countries (through supporting invisible infrastructure)*

c) *Opponents to development aid often cite cross-sectional analyses showing that countries receiving the most aid have experienced less economic growth than countries receiving little aid. Please comment on this. (1 point)*

*1) Countries at the bottom of the development ladder are the ones most likely to receive development aid. This has to be taken into account when measuring the link between ODA and GDP.*

*2) Tarp (2013) finds a robust positive relationship between aid and GDP in the last 30 years when taking into account the relationship between low initial growth and aid.*

*Mentioning either point will give the student 2 points*

d) *Opponents to development aid also often argue that development aid foster corruption and weak institutions. How does that view align with the study “Does foreign aid harm political institutions” by Jones and Tarp (2015). (1 point)*

*This notion seems out of tune with the best empirical evidence: Jones and Tarp (2015) evaluate the impact of aid on governance over a thirty year timespan. They find that development has marginally increased the quality of institutions and that this is driven by the portion of aid aimed at improving governance*

e) *What are the issues facing many developing countries when trying to collect additional tax revenue? What are the potential solutions? (2 points)*

*Several issues exists: 1) poor tax administrative data (little third-party reporting etc.) 2) more entrepreneurial work with little opportunity for withholding taxation 3) large informal economy 4) larger share of subsistence farming/work with little cash (and not meaningful to tax people living in extreme poverty 5) less resources for tax enforcement*

*(mentioning two of these points will yield 1 point for students)*

*Solutions: 1) better/more data collection with focus on merging existing data sources 2) big data analytics to identify tax cheaters 3) more resources for tax enforcement 4) anti-corruption measures through greater civil society inclusion and many more. (mentioning either of these points will give 1 point students)*

f) *Page and Pande (2018) discuss building “invisible infrastructure” to fight poverty – what is that? (2 points)*

*Invisible infrastructure consists of the social and human systems that enable the effective allocation of resources on the poor. It indeed includes the public provision of goods such as health care, and education, physical infrastructure and the rule of law. However, it goes beyond. It also comprises all the resources necessary to ensure that those in power listen to the claims of the poor and that their needs are effectively tackled. Example of such resources are incentive and information structures.*

g) *What should be the role of development aid in the future according to Page and Pande (2018)? (2 points)*

*The role of development aid going forward, according to Page and Pande, should be to support the building of invisible infrastructure. This means that aid in middle-income countries should focus on working with governments (instead of going around them), targeting aid towards better governance, supporting domestic resource mobilization and supporting the civil society to make sure people living in poverty become the ultimate principal.*