

Written Exam at the Department of Economics winter 2017-18
Advanced Development Economics – Macro aspects
Master's Course
December 20th , 2017
(3-hour closed book exam)

Please write all your answers in English.

The exam has 4 pages, and consists of 3 questions (each question has multiple parts).

Each question (A, B, and C) has a total weight of $\frac{1}{3}$ in the final grade.

Please use maximum 1 page of text to answer question B, and maximum 1 page of text to answer question C.

NB: If you fall ill during an examination at Peter Bangsvej, you must contact an invigilator in order to be registered as having fallen ill. In this connection, you must complete a form. Then you submit a blank exam paper and leave the examination. When you arrive home, you must contact your GP and submit a medical report to the Faculty of Social Sciences no later than seven (7) days from the date of the exam.

QUESTION A. Income and fertility.

Assume a household has a utility function

$$u(c, n) = \gamma \frac{n^{1-\rho} - 1}{1-\rho} + (1-\gamma) \frac{c^{1-\rho} - 1}{1-\rho},$$

where n represents the number of children, c is parental (shared) consumption, γ is a parameter between zero and one ($0 < \gamma < 1$), and ρ is the degree of relative risk aversion that is implicit in the utility function, which is non-negative and different than one ($\rho > 0, \rho \neq 1$).

Each household in the economy has an endowment of 1 unit of time, that is entirely supplied in the labor market, and thereby provides the household with a level of income y . Raising children is costly in terms of time and requires using a fraction of time τ – reflecting, for instance, that parents have less time to provide in the labor market when they have children, or that they can get help to raise their children but also pay for that. Under these conditions, the household's problem becomes maximizing u subject to the budget constraint

$$c + \tau n y = y.$$

A.1. What is the optimal number of children, n , for the household?

A.2. What is the effect of an increase in income (y), on the level of optimal fertility (n)? Explain intuitively your results. *Hint:* u is a constant relative risk aversion utility function, and the elasticity of substitution between its two arguments equals $\frac{1}{\rho}$.

A.3. When $\rho = 1$, the utility function becomes

$$u(c, n) = \gamma \ln(n) + (1 - \gamma) \ln(c).$$

In this case, what is the effect of income on fertility? Interpret your results and relate them to your answers above.

A.4. In 1960, Gary Becker proposed that declining fertility was a consequence of the rise in income and the associated rise in the opportunity costs of raising children ("An economic analysis of fertility", in Becker G. [ed.], Demographic and economic change in developed countries, Princeton University Press). Are your results in A.2 and A.3 consistent with Gary Becker's (1960) idea? Why?

A.5. Fertility rates in a number of countries in Europe started to decline permanently between 1890 and 1930. Interestingly, the table below shows that this occurred with remarkable synchronicity for countries with substantially different levels of income per capita – for instance Finland, or Germany and France, that had only about 40% or 60% of the level of income per capita in the richest countries in Europe at that time, experienced the onset of a permanent decline of fertility at a very similar time than England and the Netherlands (the richest countries in Europe at that time). At a macro level, is this type of evidence consistent with the empirical predictions from Gary Becker's (1960) idea? Why/why not?

Onset of the fertility decline in Europe

Sweden	1865	Netherlands	1910
Hungary	1890	Spain	1910
France	1900	Switzerland	1910
Germany	1900	Austria	1915
Belgium	1905	Finland	1915
Norway	1905	Bulgaria	1925
Scotland	1905	Italy	1925
Denmark	1910	Portugal	1925
England and Wales	1910	Romania	1935

Source: Reher, D. (2004), "The Demographic Transition Revisited as a Global Process", Popul. Space Place 10, 19-41.

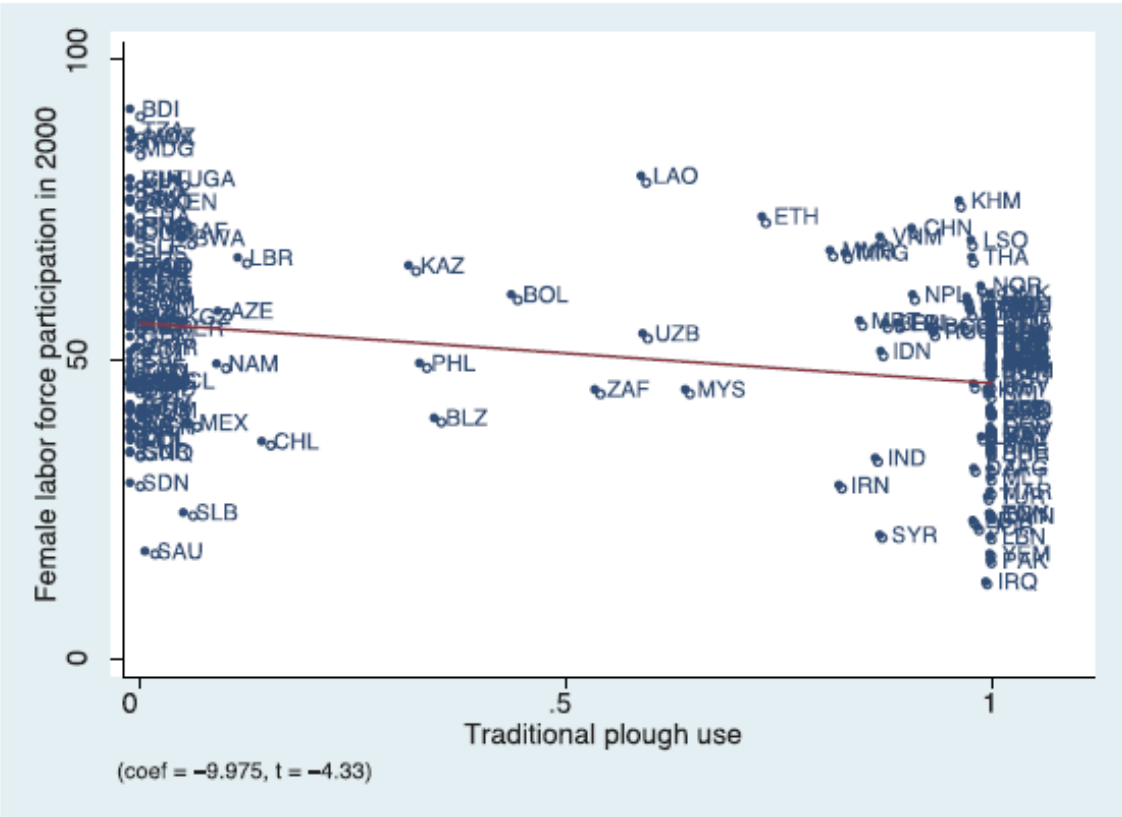
A.6. In a Freakonomics blog post in 2011, Justin Wolfers commented on an ongoing debate of whether kids were *normal* or *inferior goods*, and concluded that "kids aren't normal [goods]", essentially because "[w]hether you cut the data across countries, through time, or across people at a point in time, the same fact arises: The richer you get, the fewer kids you have." Do you agree with the prediction that *the richer you get, the fewer kids you have*, when it is taken at the country level? *Hint:* Discuss for example whether the prediction is consistent with theory and evidence about a trade-off between fertility and offspring's education, or the *quantity-quality* trade-off.

QUESTION B. Gender norms.

In 2013, Alberto Alesina, Paula Giuliano and Nathan Nunn published a study where they test the hypothesis that traditional agricultural practices had influenced the historical gender division of labor and the evolution of gender norms. Their main results show that descendants of societies that traditionally practiced plough agriculture, today have attitudes reflecting higher gender inequality, and lower rates of female participation in the labor force, firm ownership, and politics.

B.1. How does the *traditional* practice of plough agriculture help to understand differences in *current* outcomes such as the level of participation of women in labor markets, firm ownership, or politics?

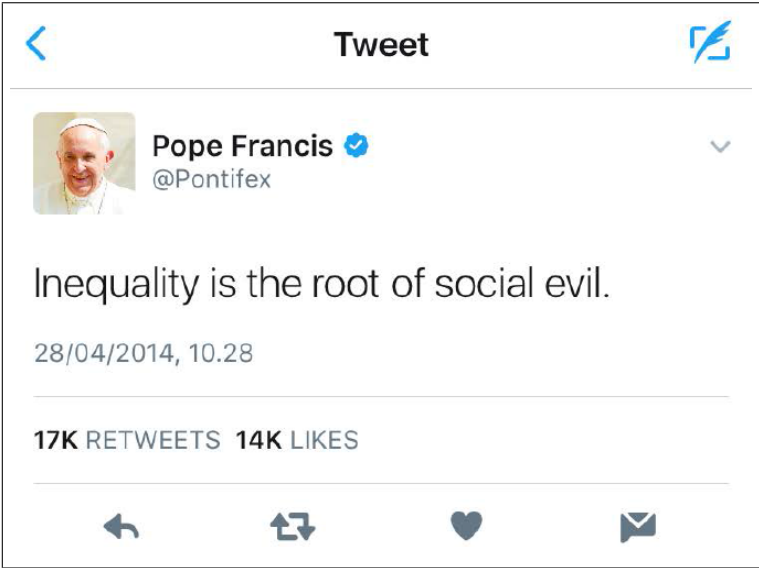
B.2. The graph below shows the unconditional relationship between a measure of traditional plough use (constructed with ethnographic data about actual dependence of ethnic groups on plough agriculture in pre-colonial times), and the level of female labor force participation across countries in 2010. The relationship goes in the hypothesized direction and it is statistically significant. Can we give this relationship a causal interpretation? Why? Use precise examples. *Hint:* Discuss different types of problems that are typical in the design of an empirical econometric analysis, and solutions that have the potential to ameliorate the incidence of those problems.



Source: Alesina, A., P. Giuliano and N. Nunn (2013), "On the Origins of Gender Roles: Women and the Plough" *QJE* 128(2): 469-530.

QUESTION C. Inequality.

Consider a tweet of Pope Francis on April 28, 2014, in which he condemns inequality:



C.1. Analyze Pope Francis’ message in this tweet, in light of the literature revised in the course.

C.2. Does higher inequality in poor countries contribute to faster progress in the reduction of poverty through the creation of economic growth?