Written exam at the Department of Economics, winter 2019-2020
Advanced Development Economics – Macro aspects
Master's Course
December 14th, 2019
Individual 12-hour take-home exam, 10:00-22:00.

Please write all your answers in English.

The exam has 6 pages, and consists of 3 questions (each question has multiple parts).

As a guideline, each question (A, B, and C) has a total weight of about $\frac{1}{3}$, although the final grade is determined by an overall assessment of all the answers provided.

As a recommendation, use maximum 2 pages of text to answer question B, and maximum 2 pages of text to answer question C.

Your answers must be uploaded as a PDF document in *Digital Eksamen*.

All aids are allowed for the exam.

Be careful not to cheat at exams!

You cheat at an exam if during the exam you:

- Communicate with or otherwise receive help from other people.

- Copy other people's texts without making use of quotation marks and source referencing, so that it may appear to be your own text.

- Use the ideas or thoughts of others without making use of source referencing, so it may appear to be your own idea or your thoughts.

- Reuse parts of a written paper that you have previously submitted and for which you have received a pass grade without making use of quotation marks or source references (self-plagiarism).

- Receive help from others in contrary to the rules laid down in part 4.12 of the Faculty of Social Science's common part of the curriculum on cooperation/sparring.

You can read more about the rules on exam cheating on your Study Site and in part 4.12 of the Faculty of Social Science's common part of the curriculum.

Exam cheating is always sanctioned by a written warning and expulsion from the exam in question. In most cases, the student will also be expelled from the University for one semester.

QUESTION A. Gender inequality in the costs of raising children.

Consider an economy in which each household is comprised of two adult individuals, $i = F$ and $i = M$. Assume that each adult individual i is endowed with one unit of time, which is entirely supplied in the labor market, and provides i with an income equal to the wage w^i. Then, total income at the household level is given by

$$y = w^F + w^M.$$

Individuals derive utility from consumption and the number of children they have. Assume that consumption and fertility decisions are both taken at the household level. In particular, assume that each household maximizes a utility function

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

where n is the number of children in the household, c is the level of household consumption, and $\gamma \in (0, 1)$ is a fixed parameter.

Raising children is costly in terms of time and earnings. More concretely, assume that there is a *child penalty* equal to $\tau \in (0, 1]$, which reduces parents' income in that amount for each child they have. This type of child penalty would arise if, for example, raising a child requires parents to reduce the time they supply in the labor market, or if parents use part of their income to hire help to raise their children. Therefore, the total costs of raising n children for parent i are equal to $\tau w^i n$.

A.1. Assume that the economy is highly inegalitarian in terms of the distribution of child-rearing costs, and that the child penalty τ described above affects only one of the parents; say parent $i = M$. Assuming that the price of consumption (c) is equal to 1, write down and describe the household's budget constraint (or the relation between total household income and the total value of household consumption and child-rearing costs).

A.2. Given the budget constraint in **A.1**, show that the household's optimal level of fertility in the inegalitarian case (n_I^*) is

$$n_I^* = \frac{\gamma}{\tau} \left(\frac{w^F + w^M}{w^M} \right),$$

and comment on this result.

A.3. Suppose inequality in the distribution of child-rearing costs reduces in the economy, and therefore that the costs of raising children fall on both parents $i = F$ and $i = M$, instead of only one of them. Rewrite the budget constraint to reflect this change in the economy.

A.4. Show that the optimal level of fertility in the more egalitarian case **A.3** (n_E^*) is

$$n_E^* = \frac{\gamma}{\tau}.$$

A.5. Why is $n_I^* > n_E^*$?

A.6. Columns (1) to (5) in the table below contain the descriptive statistics (Table A.I) in the annex to Henrik Kleven *et al.*'s (2019) study on child penalties across countries. Column (6) contains the authors' estimates of long-run child penalties – measured as the impact of childbirth on labor market earnings of women relative to men. Do these data support your arguments in **A.5**? *Hint: Look at the correlation between columns (5) and (6).*

| | Year of 1st child | | Age at 1st child | | N of children | Long-run |
| | Range | Average | Men | Women | at $t = 10$ | penalty |
	(1)	(2)	(3)	(4)	(5)	(6)
Denmark	1985-2003	1994	28.5	26.2	2.2	0.21
Sweden	1997-2011	2004	30.8	28.7	2.2	0.26
United States	1967-2006	1985	25.8	24.9	2.1	0.31
United Kingdom	1991-2008	1998	31.3	30.0	2.0	0.44
Austria	1985-2007	1995	30.0	26.5	1.7	0.51
Germany	1989-2005	1997	30.4	27.7	1.9	0.61

Source: Kleven, Henrik, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimüller (2019). "Child Penalties across Countries: Evidence and Explanations." *AEA Papers and Proceedings* 109: 122-26.

A.7. The following graph shows Kleven *et al.*'s (2019) estimates of child penalties in labor market earnings in Denmark and Sweden. What type of differences in child penalties between these two countries can you observe in the graph?
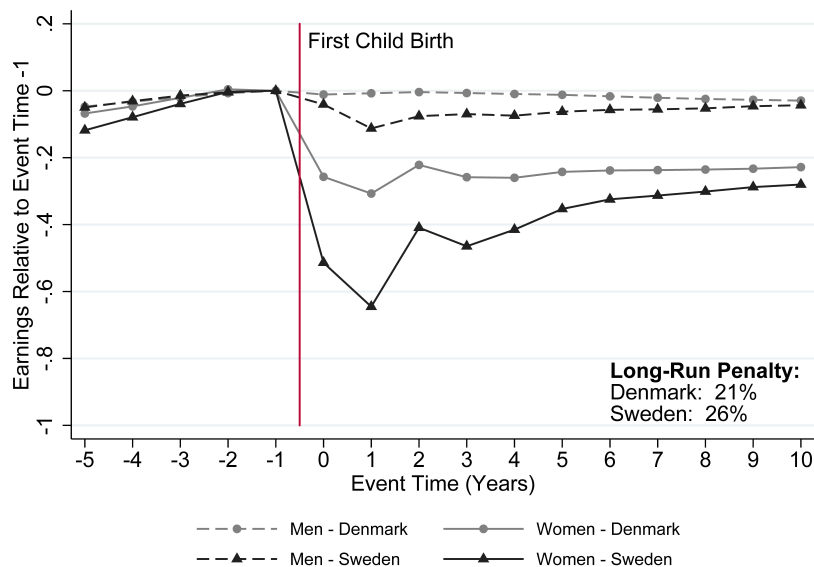
Source: Kleven, Henrik, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimüller (2019). "Child Penalties across Countries: Evidence and Explanations." *AEA Papers and Proceedings* 109: 122-26.

A.8. What explains the differences you have identified in **A.7** between Denmark and Sweden? In order to help your answer, in the table below you can find OECD data for trends in parental leave entitlements around childbirth for the six countries studied in Kleven *et al.*'s (2019).

|	Paid leave after childbirth (in weeks):						
	Fathers*				Mothers**		
	1970	1990	2000	2018	1970	1990	2018
Denmark	0	2	17	2	14	28	50
Sweden	0	1	6	14	26	63	56
United States	0	0	0	0	0	0	0
United Kingdom	0	0	0	2	18	18	39
Austria	0	0	26	9	58	60	60
Germany	0	0	0	9	14	70	58

Source: OECD Family Database. Part 3: Public policies for families and children. PF2.5: Trends in leave entitlements around childbirth. Available at http://www.oecd.org/els/family/database.htm#public_policy.

Notes: *: Length of paid paternity leave and paid parental and home care leave reserved for fathers, 1970, 1990, 2000 and 2018 (in weeks).

**: Length of paid maternity, parental and home care leave available to mothers, 1970, 1990, and 2018 (in weeks).

QUESTION B. Long-run development.

The maps below show levels of real GDP per capita across sub-national regions.
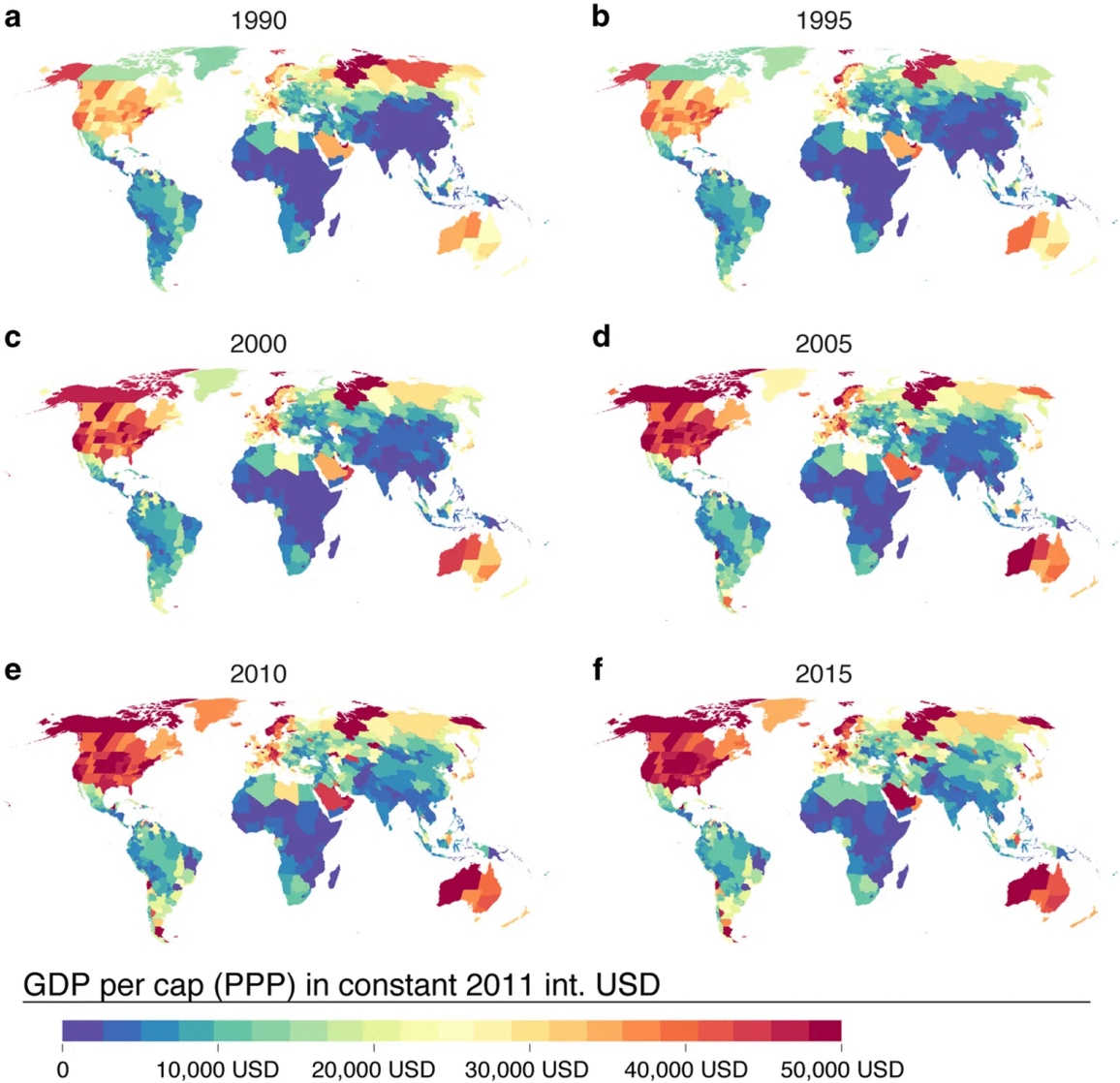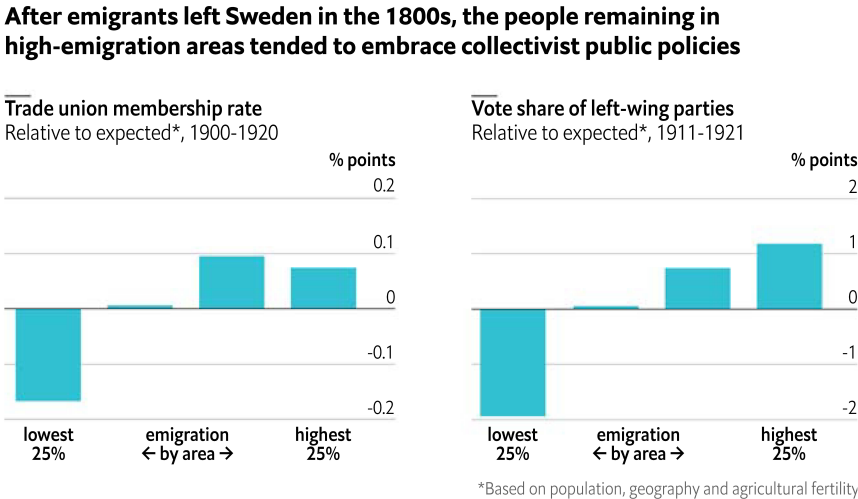
B.1. What are the *proximate* causes of differences in real GDP per capita across countries today?

B.2. What are the *fundamental* causes of differences in real GDP per capita across countries today?

B.3. Does the interaction between different *fundamental* causes help us to understand better the differences we observe in GDP per capita across sub-national regions? Support your answer with examples.

QUESTION C. Migration, cultural change, political change, and economic development.

Between 1850 and 1915, more than 30 million people migrated from different parts of Europe to the United States – which gave rise to a historical period known as the *Age of Mass Migration*. Mounir Karadja and Erik Prawitz (2019, "Exit, voice, and political change: Evidence from Swedish mass migration to the United States," *Journal of Political Economy* 127(4): 1864-1925) estimate that, between 1860 and 1920, 1.3 million Swedes – or roughly one quarter of the existing Swedish population – migrated from their country to the United States. Karadja and Prawitz (2019) explain that that level of migration had important political consequences in the country, and show that different levels of migration across Swedish municipalities had different effects on citizens' demand for political change. For example, they show that higher levels of migration between 1867 and 1900 were associated with larger support for the labor movement between 1900 and 1920, and also with larger support for the left-wing Social Democratic and Socialist Parties between 1911 and 1921. The following graph illustrates those results.

After emigrants left Sweden in the 1800s, the people remaining in high-emigration areas tended to embrace collectivist public policies

Trade union membership rate
Relative to expected*, 1900-1920

Vote share of left-wing parties
Relative to expected*, 1911-1921

*Based on population, geography and agricultural fertility

Source: "The names of migrants to America suggest they were individualists". *The Economist*, Feb 16th, 2019.

C.1. How do the results illustrated in the graph above relate to the process of *migration-induced cultural change* proposed by Anne Sophie Beck Knudsen (2019, "Those who stayed: Individualism, self-selection and cultural change during the Age of Mass Migration")?

C.2. In theory, how can this type of migration-induced political effects be related to long-term economic development in the country of origin?