Written Exam Economics Winter 2019-20

Family Economics

Suggested Answers

This document provides an outline of suggested answers to the exam. The solutions are a guide to answering the questions, and they are not meant as exhaustive. The written solutions would have to be worked out more completely.

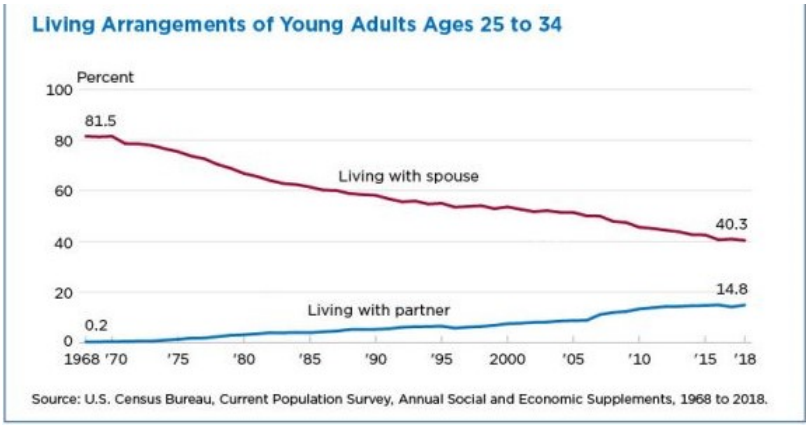
Female education and the family

Since the 1960s, women in the U.S. (and many other countries) have gained more economic control over their lives: Educational opportunities and attainment of women have increased, women have entered to a larger degree the labor market and gained financial independence. While 44 percent of women ages 30-50 had no independent earnings in 1970, 25 percent of U.S. women do not have those today. In parallel to this large societal change, data on family formation and dissolution document changes in the structure of the American family over the past 50 years.

Question 1

Figure 1 shows the share of married (living with a spouse) and cohabiting (living with a partner) adults aged 25-34 in the U.S. for the period 1968-2018.

Figure 1: Marriage and cohabitation among young adults in the U.S., 1968-2018.



Summarize the central message of the graph. Describe additional data you would want/need to get a fuller picture of the general development of marital patterns in the U.S. over time.

Suggested answer

Students should mention the following central aspects:

- The graph shows an increase in the share (stock) of young adults cohabiting in each year over the period considered (from close to zero to around 15 percent in 2018). At the same time, the graph shows a decrease in the share being married in the given age group. The decrease in marriage is not fully compensated by increase in cohabitation, i.e. the graph suggests an increased importance of the single state (may

include, e.g., living with parents) for young adults. The graph further suggests that marriage during the largest share of the period considered was the dominant living arrangement for young adults in this age group. For the final year(s) this conclusion may no longer hold.

- To get a fuller picture of the general development of marital patterns in the U.S., additional information could include:
  - Explicit information on the single state (living alone).
  - Information on entry and exit decisions: The graph shows stocks and that picture may conceal important changes flows into marriage and divorce. (Entry and exit decisions–also during younger ages than shown in the graph–may have changed over time and the single state may today consist of more previously married individuals than earlier?)
  - Information for other age groups: We may not conclude that the importance of marriage in total has declined from the above graph - the pattern we see could suggest that marriage only is delayed rather than replaced (would need to know how many people remain never-married). Additional data for older age groups could help us understand better whether a delay explains the pattern in the graph.
  - Information on whether patterns vary across groups in society, e.g. educational groups (or income), gender or racial groups, could be discussed here, too. (Given the age group considered, the graph may make us think about the importance of non-marital fertility–also here, we would need more data to assess its development).

Question 2

During the course we have covered different *potential gains to marriage*. A central gain to marriage described by Becker is *specialization in the household*. Describe—with reference to the theory covered in class—how changes in the educational opportunities of women over time may have impacted the gains to marriage.

Structure your answer as follows:

(a) Briefly describe the basic structure (assumptions, theorems).

(b) Describe how the changes in the educational opportunities of women since the 1970s

may have impacted the gains from specialization. (Discuss predictions about the gendered dimension.)

(c) Relate the theory on gains to specialization to the pattern displayed in Figure 1. Also comment on the marriage/cohabitation dimension.

Suggested answer

The students should in their own words describe the gains to specialization in the household as presented in chapter 2 of Becker's Treatise and discussed in class:

- (a) In Becker's model households combine time and goods to produce household commodities (which they derive utility from). We focus on two-person households here. There are two sectors (home and market) and households decide on how to allocate time across the two sectors (initially members of households have no preferences for work only in one sector, all members of households gain from increase in hh output). Ex-ante equal agents will benefit from specialization in the household if human capital is sector-specific in the following ways: there are two types of human capital that increase productivity in the corresponding sector only (household or market); and human capital increases from time spent in that sector. The household members allocate time to each sector on the basis of comparative (not absolute) advantage.

  If both members of the household have a greater stock of human capital in one sector than in the other, they have different comparative advantages (refer to productiveness of their time use). According to Becker's Theorem 2.1, at most one member would allocate time to both the market and household sectors. Thus, household members benefit from production complementarities when combining time and market goods to produce commodities. Theorems 2.2 and 2.3 underline that if (i) household members have different comparative advantage their investment behavior would mirror that advantage and (ii) in an efficient household at most one member would invest in both types of hc and allocate time in both sectors.

  Specialization induces dependency on others. Thus it usually requires the ability to make credible commitments, enforce effort provision etc. Here marriage can serve as an important contract (higher exit costs than cohabitation). Furthermore, specialization in Becker's view is in part driven by intrinsic (biological) differences between women and men. Given the importance of hc investments, the basic framework relies more on hc investment behaviors and time use in a given sector to explain specialization in households. However, complementarities in household members time use may decrease the advantages of specialization.

- (b) Becker's prediction of who specializes in which sector primarily depends on (small) differences in human capital, or comparative advantage. So a theory of specialization would predict that specialization in the household would follow existing human capital differences. Increases in the average educational attainment of women since the 1970 have decreased the relative differences in human capital between men and women. Furthermore, increased educational attainment of women should lead to greater earnings potential on the labor market. Given the increase in educational attainment among women, we may expect that the (prior) sexual division of labor inside hh is less advantageous. Thus this change may have decreased this central potential gain to marriage. However, taking the theoretical framework at face value and, critically, assuming that higher average hc investments by women result in larger returns on the market, specialization in the household would remain beneficial and we could expect a situation with higher educated women specializing in the market sector (on average) and men specializing in the household (and one of them possibly working in both sectors)—a reversal of specialization? In Becker's argument, the importance of gendered aspects of specialization (like childhood upbringing and biological differences) still remain important and will impact the potential gains to women's hc investments. Thus this may explain why we may not see a reversal of specialization patterns and persistent gendered specialization although educational opportunities for women have increased dramatically (e.g. remaining lower expected returns to hc investments for women). Focusing on the overall increase of women's educational opportunities relative to men we still may conclude that this development has contributed to a decrease of the gains to specialization.

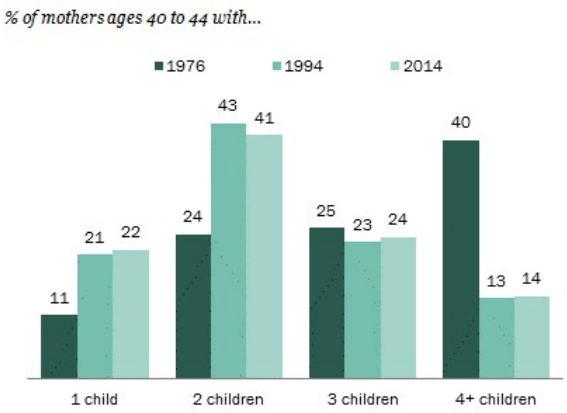
- (c) Figure 1 could be related to the framework layed out above in the following ways: The observed decrease in young people living inside marriage may be related to an (over time) decreased importance of gains to specialization, partly induced by increased average educational opportunities (and resulting hc investments and changed labor market prospects) of women (relative to men) over the period. If returns to specialization within a household fall, then the opportunity costs of remaining single rather than marrying fall.

  As noted initially, some of the decrease in the importance of marriage may be a delay to later ages, and the rise in cohabitation may reflect this pattern. However, in general lower potential gains to specialization may have contributed to an increased overall importance of cohabitation (as specialization requires a more secure commitment due to dependency on others; less specialization means less of this). Inside cohabitation, however, other gains to household formation (such as joint consumption, shared leisure) may still be realized.

Question 3

Figure 2 shows the share of mothers with a given family size in the U.S. for selected years in the 1976-2014 period.

Figure 2: Family size in the U.S., 1976-2014.



(a) Shortly describe the central message of the graph and what you can/cannot conclude from it.

(b) Lay out Becker's model for the demand for *quantity and quality of children* as described in the Treatise.

(c) Discuss (based on (b)) the role of the increase of female educational opportunities in explaining the pattern of the graph.

(d) Discuss (based on (b)) the access to contraception in explaining the pattern of the graph. What does empirical evidence covered in class suggest? (Hint: Here discuss research on the impact of the pill on women's outcomes.)

Suggested answer

(a) The students should start by describing the graph:

- The graph illustrates the development of total fertility for women in the U.S: Comparing mothers aged 40-44 (likely completed fertility) at three different points in time, the graph suggests a decline in total fertility for women in the U.S. (see Figure 2): In 1976, a 40 percent plurality of mothers who had reached the end of their childbearing years had given birth to four or more children. In 2014, a similar share of mothers at the end of their childbearing years has had two children, and just 14 percent have

had four or more children. At the same time, the share of mothers ages 40 to 44 who have had only one child has doubled, from 11 percent in 1976 to 22 percent in 2014. Since the 1970, the U.S. has experienced a decrease in the prevalence of large families and a rise in the prevalence of small families. At the same time, the graph is based on mothers only and thus does not allow us to assess the importance of childlessness across cohorts. The graph does not inform us about how patterns of fertility vary across groups (e.g. educational, race), about other aspects of fertility decisions (e.g. comment on role of timing of fertility, household types), or what the most important contributing factors for the changes are.

(b) Students should summarize the quantity-quality model and focus on the following aspects covered during class:

- Becker describes changing fertility patterns starting with a comparison of fertility in different societies and over time. General observation: Decrease in number of children for developed countries, as e.g. the U.S., alongside with economic development (rise in income). Becker's framework distinguishes demand for number and quality of children—each family maximizes utility over n (number of children), q ((same) quality of children), Z (commodities)
- If we ignore demand for quality: demand for children fully depends on relative price and full income (eq 5.4)
- Observation in empirical data (fertility decline in developed world) would be in line with increase of price of children alongside with income increase - Becker states that interaction of quantity and quality is the main explanation. Reintroduce quality q: (eq. 5.8) Shadow price of n(q) depends on q(n). Thus demand for n and q depends on own shadow price but also on demand for other commodities and on n*q through the budget constraint
- Small changes in n(q) can thus lead to large changes in fertility: Walk for example through example of (exogenous) increase in n - increase shadow price of q - reduce demand for q - reduce shadow price of n - further increase of n until new equilibrium. Interaction of n and q depends on substitutability in utility function - special relation of n and q derives from them not being close substitutes (Becker's example: education of children depends closely on the number of children although edu per child and number of children are no close substitutes)
- Pos change in full income: likely larger pos impact on quality than quantity - with rising income, demand for more quality (neg impact on quantity)

Question 3

(c)

- Students should discuss the impact of the expansion of female education on fertility decisions (wrt number of children) mainly focusing on the price of women's time (due to higher hc investments and improved earnings possibilities). Rising educational and labor market opportunities increase opportunity costs of children and give women incentives to invest in human capital instead. Increases in the price of female time would likely impact the number of children more, as q is time intensive and has to be purchased for each child (assume same q for all children). The increase of female educational opportunities may thus have contributed to the pattern in the graph: The decrease in the number of children across cohorts of mothers shown in the graph may partly reflect the increase in the value of female time (across the cohorts of 40-44 year old women observed in 1976 vs 2014, for example)-leading to a decrease in n demanded. The graph does not give any information on the quality of children (and ignores childlessness).

(d)

- In Becker's basic framework contraception is not the primary driving force but can strengthen the process leading to smaller n and larger q. Contraception access lowers the cost of controlling fertility and this role may have been important alongside the changes described in (c). The pattern in the graph may be in line with the introduction of the birth control pill in the 1960s impacting fertility: Easier access to contraception for the younger cohorts (mothers aged 40/44 in 1994- in their reproductive years after the intro of the pill) relative to older cohorts (mothers in same age group in 1976- in their reproductive age before the intro of the pill) coincides with on average smaller families for the younger cohorts of mothers. Of course many other factors changed for these cohorts. To narrow in the impact of access to contraception (and abortion), empirical studies have looked at the role of its expansion on women's outcomes. Empirically, the staggered introduction of access to the pill (and access to abortion) in the U.S in the 1960s has been exploited to say more about the impact of access to contraception/the pill on women's hc investment, labor market outcomes and timing of marriage—all factors that may contribute to decreasing fertility. Students should refer to Goldin and Katz (2002) or Myres (2017) to describe the ways in which research has studied how the access to the birth control pill has altered these outcomes.

Question 4

In the light of changes in fertility patterns, empirical research has been and is still concerned with understanding the impact of *family size* on maternal and child outcomes. Based on course readings, pick two relevant studies, explain their aim, the empirical challenge, their identification strategy (how they address the endogeneity of fertility choices) and summarize/critically assess their *main* findings.

Suggested answer

Answers will vary but students should pick among studies covered and discussed in class: Angrist and Evans (1998), Lundborg et al (2017), Kleven et al (2019), who all study the impact of number of children on different aspects of mothers' labor market participation, wages and other labor market outcomes. (We have also covered empirical work on timing and spacing of child birth on mothers' outcomes - those studies are less appropriate given the question posed - primary focus on family size.)

They could also refer to Black et al (2005), who study the impact of family size on child outcomes (education, teen fertility, earnings).

Students should describe endogeneity concerns in their own words: The choice of family size is likely to be correlated with other family characteristics that are unobserved but correlated with outcomes. The students should describe the ways in which the different studies attempt to circumvent those and what underlying assumptions the studies make (same sex instrument, twin instrument, IVF success instrument; event study approach). Finally, the students should summarize the main findings (and critically assess them/compare to other course material).

Question 5

Changes in marriage formation since the 1970s have been coinciding with changes in *divorce patterns* in the U.S. Overall, divorce rates have been increasing.

Describe how empirical studies have analyzed *divorce and child custody laws* to learn about *decision making in the family*. Pick two empirical studies and explain how these study have tested central predictions from theoretical models (be specific when outlining what central predictions are made and how the empirical paper tests them). Summarize the conclusions.

Question 5

Suggested answer

The students should refer to two of the following studies from the course (or other relevant economics journal articles): Halla (2013), Stevenson (2007), Gray (1998), Stevenson and Wolfers (2006), Nunley and Seals (2011). Those articles analyze the impact of different aspects of divorce legislation on marriage formation, divorce, inside marriage decision (such as violence, investments in children).

The studies exploit legal changes across geographic entities and over time, to credibly test theoretical predictions about decision making in the family. The students should describe the ways in which these studies employ changes in divorce and custody laws to test predictions derived from different models of decision making, as covered in class. For example, in a discussion of Stevenson and Wolfers (2006) students should highlight the following: the authors study the impact of the introduction of unilateral divorce laws on family violence. They interpret the easier access to divorce as a redistribution of bargaining power inside existing marriages (without unilateral divorce individuals leaving (violent) relationships would bear large costs). Unitary models of decision making would not expect this law change to impact the likelihood of divorce, while bargaining models that emphasize outside (marriage) options would predict that the change of bargaining power should impact the outcome that they consider inside marriage: the prevalence of violence. The findings of the paper support this latter view and additionally point to the (longer-run) impact of unilateral divorce laws on the types of marriages formed after the introduction of the laws (further impacting rates of family violence in these new unions).