

An Opportunity Cost Approach to Fertility Pattern in 19th to early 20th century Korea

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This study explores the determinants and the pattern of a family's decision in controlling fertility from an opportunity cost perspective. Many argue that research priority should be given to the economic attributes of the following changes to determine the extent to which they influence marriage, fertility, and investment in children. A family has motivation in bearing more children when the increase in the number of children increases production capacity of a family.

The value of children, however, is found not only in an economic but also in a psychological context. More specifically, a family has strong motivation to succeed the value of a family (lineage) for a long period. And having a child increases opportunity costs of parents or a family. First, it is psychologically hard to bear children. Second, parents need to substitute their consumption expenditure with that for children. That is, parents tend to have more children until the marginal benefit of a child is greater than the marginal costs of having a child. The net costs of a child is different not only across families but also across periods by the development of social infrastructure. In the empirical analysis, we control the fixed-time effects to consider the improvements in the technology of contraceptive goods and services reckoned in terms of their effectiveness and their cost to the family, and the improvements and the declines in the price of labor-saving consumer items. The time effects also summarizes changes in the economic opportunities of investing in the education of children and changes in the labor-market opportunities for women and for teen-agers as an economy develops. Additionally, this cohort-level analysis with the time effect reflects the decline the cost of reducing infant mortality by a change that currently characterizes mainly the developments underway in poor area.

We analyze two microdata - *Jokbo* and *Jejeokbu* - in 19th to early 20th century Korea. Our family-level data are unique: we link two micro data, *Jokbo* and *Jejeokbu* for the overlapping period. *Jokbo* (族譜, a genealogy) has been popularly used for studying life events of individuals because it contains the records of birth, marriage, child-delivery, and death. Although it contains the information about one

ancestral line, it includes so many individuals that analysts can consider it a part of panel data at a certain point of a tree. *Jejeokbu* (除籍簿, a dropout record from the registration) contains similar information with *Jokbo*. We use the *Jejeokbu* of the same region with *Jokbo*. *Jejeokbu* complements the weakness of *Jokbo* by containing people's record from a different lineage or a different social status to complete cross-sectional data. By connecting each year's individual data with those of other years, we generate the time-series cross-sectional data that contain more than 30,000 individuals, born between 1800 and 1940s. We assume that taste toward fertility is fixed for all by the restriction on the region and the period in which individuals lived.

We first examine the trend of the age-specific mortality rate during this period and then move our focus to the fertility pattern. We summarize the mortality patterns according to our robust Ordinary Least Squares (OLS, henceforth). In order to improve our understanding on the factors in increasing the length of a life for the period, we examine factors by survival analysis and hazard ratio. We use cross-sectional OLS and Logit model to find the determinants for a family to have more or less children. Next, we highlight what the major factors that make a family have more children using information about social status, household location, and parents' health conditions. We also consider changes in a social environment - such as a colonial period and the development of health care technologies - in analyzing the statistical significance of variables' marginal effects. Additionally, we analyze factors that influence on the number of sons and daughters to study if there was a male-oriented rule in allocating resources and keeping its lineage.

Some noteworthy findings are i) when a family lives in an urban area or close to a city, it is highly likely to have more children; ii) with a lower social status of a father, the family tends to have less children; iii) if a father or a mother was born between 1800 and 1940s, they closer to 1940s tend to have fewer number of children, sons in particular; iv) it is not statistically significant for the first son to have active fertility control in giving birth of son.