Name: Wai Yu Amanda, Ng

Student number last 5 digits: 17350

Course code: ENV399

Course instructor: Dr. Brad Bass

Assignment: Annotated Bibliography

My main research question:

How do social, occupational, and financial factors influence South Korea's low national birth rate? A simulation model approach to investigate how current government policies* should be adjusted and new policies should be introduced to bring South Korea's birth rate back to the safe zone.

(*For example: childcare grant, days of maternal leave, parenthood value education, availability of daycare centres)

Note: Our group is considering running different simulation models for other low-birth rate countries as well. Since South Korea has the lowest birth rate in the world, the South Korea model will serve as an important baseline and reference model for building other countries' models.

All references listed below are peer-reviewed articles from different authors and journals. 8 out of 10 of them are published no older than 2018.

Paper 1:

Hur, Y.-M. (2021). Changes in Multiple Birth Rates and Parental Demographic Factors in South Korea During the Last Four Decades: 1981–2019. Twin Research and Human Genetics, 24(3), 163–167. https://doi.org/10.1017/thg.2021.23

Summary:

This study focuses on exploring the changes in multiple birth rates from 1981 to 2019 in South Korea and examining parallel changes in maternal age and educational attainment of parents of multiples and singletons. Data about plurality of births (singleton, twin, triplet and other higher-order births), types of twinning (monozygotic or dizygotic), maternal age at birth, and educational attainment of parents of multiples and singletons from 1981 to 2019 from the Korean Statistical Information Service are plotted and their trends across time are examined. The total twinning birth rate, defined as the number of twin individuals per thousand maternities, has shown an upward trend over time, despite the rise in the average maternal age. Besides, the percentages of individuals who completed a CHD are higher among parents of multiples than among those of singletons in recent years. This potentially suggests that a delay in childbearing and mothers' completion of CHD contributes to the increase in the non-singleton birth rate.

Significance of this article to our research project:

This article reveals the rise of multiples in the South Korean population and the influences of maternal age and mothers' completion of CHD on, particularly, multiple birth rates. It provides a new perspective that an increase in maternal age can still contribute to increasing birth rate. In our future COBWEB model, we should take into consideration the positive impact of maternal age on the fertility rate and the adequacy of government support in enhancing prenatal and postnatal care for multiples and mothers of multiples.

How it connects to other articles:

Childcare burden is highlighted as an important factor to influences fertility intention in Paper 5. Knowing that there is a growing population of multiples in South Korea (as shown in this article), attention should be called on the government to provide extra financial and social support towards households with multiples.

Paper 2:

Ji, S.-Y., & Jung, H.-S. (2021). Work–Family Balance among Dual-Earner Couples in South Korea: A Latent Profile Analysis. International Journal of Environmental Research and Public Health, 18(11), 6129. https://doi.org/10.3390/ijerph18116129

Summary:

Work–family balance refers to a situation where individuals can perform the role of employees at work and the role of family members at home with equal involvement. It consists of two aspects: (1) gains which lead to the expansion of resources, improvements between roles, and other welcomed outcomes and (2) strains which lead to the opposite. This study aims to classify the double-earner couples' types of work–family balance and identify the attributes of each profile. The ultimate goal is to provide implications for the establishment of a preventive intervention program for each profile and contribute to establishing strategies to overcome low birth rates. Latent profile analysis (LPA), a person-centered (not variable-centered) approach similar to clustering, is used in this study. This approach identifies clusters of individuals that differ qualitatively by examining the strains and gains experienced by double-earner couples. The clusters are then classified according to work-family balance levels (high gain, moderate gain, low gain). For each level, the characteristics of embedded individuals are analyzed. Note that males and females are clustered separately. Hence, it results in a total of 6 latent classes (3 for each gender). It is found that men are more likely to belong to the high-gain class when they hold a temporary work position (or are self-employed), have multiple children, have good health, have low depression, have higher life satisfaction levels, and have strong social support. Meanwhile, Women are more likely to belong to the high-gain class when they experience high happiness levels and strong social support (which is the most important factor of all). Yet, as opposed to men, having multiple children is a strain on women.

Significance of this article to our research project:

Instead of focusing solely on women, this article conducts analysis on both genders in double-earner couples and highlights that social and mental support as important incentives for fertility intention. It reveals how stress in the work-family balance affects family planning decisions. It is common for both the husbands and wives both join the workforce in South Korea nowadays. Therefore, a family-friendly system should be established to support double-earner couples' additional child-rearing responsibilities. In our future COBWEB simulation model, a family-friendly social system should be included as a "resource".

How it connects to other articles:

See Paper 8

Paper 3:

Jung, M., & Lee, D. S. (2023). Subnational variations in births and marriages during the COVID-19 pandemic in South Korea. Demographic Research, 48, 867–882. https://doi.org/10.4054/DemRes.2023.48.30

Summary:

This article investigates whether fertility declined beyond the first wave in early 2020 (COVID-19 times) at both the national and the subnational levels in South Korea. Data on monthly birth and marriage registration across the 17 regions in South Korea from January 2016 to December is quantified into monthly general fertility and marital rates. These data are then classified into "pre-pandemic" and "during pandemic" according to their respective timestamp. Paired t-tests are conducted to see if there are statistically significant differences in average fertility rate (GFRs) and average marriage rate (GMRfs) between pre-pandemic and during the pandemic. Seasonality of births and overall time trends of declining fertility in Korea are taken into account in the analysis to exclude influences of these confounding factors. Interrupted time-series analysis is conducted using a regression model established in early papers to directly estimate differences in the GFRs and the GMRfs between the pre-pandemic and the post-pandemic periods. Results suggest that, at least until 2021, fertility rates did not decline beyond the pattern explained by the already declining fertility in Korea. For marriages, an obvious post-pandemic decline is observed across regions. There are larger subnational variations in fertility rate than in marriage rate due to the impact of the pandemic.

Significance of this article to our research project:

This article suggests that the pandemic does not create significant impacts on South Korea's birth rate and we should expect it to create minimum influences on our future COBWEB simulation model and it makes sense if we leave it out from the South Korea model.

Paper 4:

Kashyap, R., & Villavicencio, F. (2016). The Dynamics of Son Preference, Technology Diffusion, and Fertility Decline Underlying Distorted Sex Ratios at Birth: A Simulation Approach. Demography, 53(5), 1261–1281. https://doi.org/10.1007/s13524-016-0500-z

Summary:

This study aims to use a bottom-up approach to understand how population-level (macro level) sex ratio at birth (SRB) trajectories are influenced by individual-level (micro level) reproductive behaviours, such as levels of son preference, technology diffusion, probabilities of sex-selective abortion and fertility decline. An agent-based simulation model is built and calibrated to South Korea which can be used to describe and formalize the micro-level processes that generate macro-level SRB distortions. South Korea has encountered all three stages of "sex ratio transitions" (I.e. distorted SRBs emerged in the 1980s, SRBs started to level off by the 1990s, and SRBs showed a remarkable turnaround toward normalization by the mid-2000s) and is a good case study to run simulations on. Simulations revealed that relatively low levels of son preference can still result in skewed SRB levels if (1) prenatal sex determination technology diffuses early and steadily, and (2) fertility falls rapidly to encourage sex-selective abortion. The model sensitivity analysis also highlighted that the shape of sex ratio trajectories is particularly sensitive to the timing and speed of prenatal sex-determination technology diffusion.

Significance of this article to our research project:

The agent-based simulation model adopted in this article carries the same nature as the COBWEB simulation model that we will use in our future research project. This article serves as a great reference in adjusting model parameters to simulate situations in birth-rate-related projects.

How it connects to other articles:

See Paper 7

Paper 5:

Kim, E. J., & Parish, S. L. (2022). Family-supportive workplace policies and benefits and fertility intentions in South Korea. Community, Work & Family, 25(4), 464–491. https://doi.org/10.1080/13668803.2020.1779032

Summary:

This study examines the effects of family-supportive workplace policies and benefits on boosting working women's fertility intentions in South Korea by the current number of children. The family-supportive workplace policies studied in this article include the availability of maternity leave, childcare leave, on-site childcare centres, family allowance, childcare cost-related subsidies, flexible working hours, and school expense subsidies. Regression models are built, and the model coefficients are used to describe the relationships between fertility intentions and family-supportive workplace policies with a range of demographic variables being controlled. Results indicate that, among all policies, the provision of maternity leave and childcare leave carry the most significantly positive associations with overall fertility intention (both first birth and non-first births). This means that the more availability of maternity leave and childcare leave offered at their workplace, the more likely employees will consider having children. However, the provision of flexible working arrangements is associated with decreasing first-birth fertility intention.

Significance of this article to our research project:

As gender equality has been promoted in South Korea in recent years, more females join the workforce and seek to attain financial independence and pursue their own careers. To increase the birth rate in South Korea, it is important to encourage the younger working generations (who may be unmarried and do not have children) to consider having kids. This article specifically points out that certain family-supportive workplace policies (i.e. availability of maternity leave and childcare leave) can increase workers' fertility intentions. Given the significance of these policies, they should be included in our future COBWEB models.

How it connects to other articles:

See Paper 1 and Paper 10

Paper 6:

Summary:

This study aims to investigate gender differences in willingness for childbirth, fertility knowledge, and the value of motherhood or fatherhood among college students in South Korea and to explore the influences of different factors on willingness for childbirth. Chi-squared tests and t-tests are performed to identify gender differences in general characteristics, willingness for childbirth, fertility knowledge, and value of motherhood of fatherhood. A multiple logistic regression model is built to examine the influences of sociodemographic factors, health behaviour characteristics as well as fertility knowledge and the value of parenthood on willingness for childbirth. It is reflected that female students show a lower willingness for childbirth, fertility knowledge, and value of parenthood than male students. Among all factors, the value of parenthood is an important influencing factor in both male and female college students' willingness to childbirth, while monthly allowance is an additional important factor among female students.

Significance of this article to our research project:

The study findings are relevant and significant because investigating college students' willingness and thoughts about future parenthood provides an opportunity to explore planning for childbearing in advance. It inspires the development of effective interventions targeting college students, who are potential future parents, to promote fertility. This suggests that education on parenthood values can be imposed to assist students' reproductive decision-making and promote healthy pregnancy. In our future COBWEB model, education on parenthood values to young adults can be included as one of the "resources" in boosting the fertility rate.

Paper 7:

Lee, J., & Smith, J. P. (2017). Fertility behaviours in South Korea and their association with ultrasound prenatal sex screening. SSM - Population Health, 4, 10–16. https://doi.org/10.1016/j.ssmph.2017.10.003

Summary:

This study examines how ultrasonic technology has affected fertility decisions in South Korea, a country with strong son preference. The probability of a child being a boy is calculated using a linear probability model, regressing on the year the child was born, the gender composition of siblings, the mother's education (or the father's when the mother's information is unavailable), region, and religion. Depending on the ideal and achieved gender composition of children, parents may adjust their future fertility decisions. It is hypothesized that this effect would be even stronger after the introduction of ultrasonic diagnostic technology. Thereby, another linear probability model is built to estimate the parents' decision to have additional children, regressing on the gender composition of existing children. Results indicate that

(1) availability and loss regulation of prenatal sex screening contributes to sex imbalance; and

(2) having only daughters significantly increases the probability of parents having another child.

Significance of this article to our research project:

This article provides insight into how the gender composition of existing children and the availability of ultrasound technology affect family planning decisions, especially among parents with only daughters deciding to have another child. In our future COBWEB model, we should take into consideration South Korea's level of son preference and gender composition of existing children in a household to estimate/simulate fertility intention.

How it connects to other articles:

Paper 4 suggests that sex determination technology contributes to the sex ratio at birth, and this article further supplements the influences of prenatal screening technology on a family's future fertility decisions.

Paper 8:

Lim, S. (2021). Socioeconomic differentials in fertility in South Korea. Demographic Research, 44, 941–978. https://doi.org/10.4054/DemRes.2021.44.39

Summary:

This study examines differences in socioeconomic status at individual and household levels between (1) childless married women, (2) married women who experienced transition to only first births and (3) married women with one child who experienced transitions to second births. Logistic regression models are built to evaluate the relationships between each socioeconomic status indicator (i.e. educational attainment, household income, employment type, homeownership) and the likelihood of having the first/second birth. These models can predict the likelihood of first and second birth using information about one's socioeconomic status. Results show that a husband's higher socioeconomic status (such as college education, standard employment, and homeownership) is conducive to a transition to parenthood and second births. On the contrary, the wife's employment, particularly standard employment, is negatively associated with both first and second childbirth. Among all indicators of socioeconomic resources, stable housing arrangements and the husband's employment security appear to be the most important factors for a married couple's fertility decisions.

Significance of this article to our research project:

Income inequality has always been a social issue in South Korea which leads to a divergence in family structure and behaviors according to socioeconomic status. In particular, socioeconomically disadvantaged married couples tend to delay their transition to parenthood. Therefore, policies to address low fertility should pay extra attention to the challenges faced by individuals of lower socioeconomic status. For instance, policies to help lower the burden of balancing work and childcare should be offered to employees who want to continue their career jobs to support the family's finances. With appropriate support to ensure socioeconomic status and employment stability within households, couples will be encouraged to have children.

How it connects to other articles:

This article points out the employment status influences on family structure which connects back to Paper 2 which expresses challenges faced by double-earner families, especially those with lower socioeconomic status. It re-emphasizes the importance of comprehensive social and financial support to balance double-earner households' burden on fulfilling both work and child-rearing responsibilities.

Paper 9:

Son, Y. J. (2018). Do childbirth grants increase the fertility rate? Policy impacts in South Korea. Review of Economics of the Household, 16(3), 713–735. https://doi.org/10.1007/s11150-017-9383-z

Summary:

To strive against the low fertility rate, many municipalities in South Korea have been providing family benefits in the form of childbirth grants and child allowances. This study examines the impacts of these family benefits on the fertility rate in Korea. A difference-in-differences approach is adopted in this study. Given that different municipalities began providing the family benefits at different times, the treatment group is defined as municipalities that adopt the policy during the sample period, while the control group consists of municipalities that do not adopt the policy during the period. By comparing the fertility rates between the two groups, an estimate of the impact of family benefits on fertility rates is predicted using an empirical model (i.e. a prediction model based on observations rather than on mathematically describable relationships of theory). It is concluded that a 10 million Korean won increase in family benefits is associated with a 3.5% increase in the total fertility rate. Therefore, family benefits in the form of childbirth grants and child allowances have shown to be effective to some degree in increasing the fertility rate. However, an increase in family benefits of about 44 million Korean won per child would be required to raise the total fertility rate to a safe zone above 1.5 children per woman. Yet, the population declines are gradual and can be reversed easily, so the policy may not have true economic significance.

Significance of this article to our research project:

This article suggests that childbirth grants may not be a long-term solution to the low birth rate problem arising in South Korea. In our future COBWEB model, childbirth grants can still be introduced as financial "resources" to the population "agents", but the "food energy" it carries must be carefully assessed.

How it connects to other articles:

Results from paper 5 indicate that the childcare burden is highlighted as an important factor in influencing fertility intention. This article proposes a solution to alleviate the childcare burden by providing financial support and shows that this may not be an effective solution to bring South Korea's fertility rate back to the safe zone.

Paper 10:

Trends in Female Workers' Childbearing Intentions in South Korea

Summary:

This study aims to analyze social demographical factors that affect South Korean working women's childbearing intentions over the years. Decision tree analysis, a non-parametric supervised learning algorithm, is utilized to identify group characteristics that predict future childbearing intentions, and the impact level of each factor. It is a tree-like graphical representation which helps draw conclusions on childbearing intentions (a binary response consists of "Yes" and "No") based on the social demographic conditions. The input factors are categorized into individual (e.g. Age, number of children, level of education), occupation (employment type, work satisfaction) and systemic levels (parental leave, family allowance, cost of childcare etc.). The childbearing age and the number of children are highlighted as common factors affecting childbearing intentions across all years. In addition, the impact levels of occupational factors have increased in female workers over the years but that of the individual and systematic factors have decreased recently.

Significance of this article to our research project:

This article reflects the number of children as a hindering factor towards childbearing intentions. This potentially implies that childcare in South Korea creates a highly significant burden on parents. In our future COBWEB model, it is worth including "childcare burden" as one of the "diseases" to observe its influences on the birth rate and introducing "government childcare support" as a "resource" to test its effectiveness in offsetting the negative effects created by "childcare burden".

How it connects to other articles:

This study looks into a similar topic as in Paper 5 but a different statistical approach is adopted to examine the relationships. The results once again highlight the burden of childcare among South Korean parents and re-emphasize the urge on the government to offer accessible childcare resources.

What is missing in this annotated bibliography list?

(1) LGBTQ+ community

All the studies listed above focus on fertility intentions between couples of heterogender (male and female). The LGBTQ+ community, especially lesbian couples, is not included in the search. Since South Korea has not legalized same-sex marriage, sperm banks are only accessible to heterosexual married couples. There may be an interest in raising children among this marginalized community if in vitro fertilization services become available to them.

(2) Single mothers and teen parents

Single mothers and teen parenthood (eg. high school students) are not specifically investigated in the studies listed above. In South Korea, premarital pregnancy is considered shameful for adults and unacceptable for teenagers. To avoid facing prejudice and discrimination from society, some females who accidentally become pregnant without a marriage opt to (or are forced by their close ones to) abort the fetus. Research about this additional conservative cultural factor towards premarital pregnancy should be conducted.