The Role of Extended Families in Household Fertility Decisions: Evidence From the Indonesian Family Life Survey

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Abstract

Galor and Weil (1996) point out in their Gender Gap Model that capital accumulation positively affects women's relative wages and incentivizes them to work more, thus reducing fertility. However, having extended families in a household in many developing countries such as Indonesia may influence how it allocates time for work, affecting its fertility decision. This paper seeks to investigate the effect of having extended families on a household's fertility decision using the fifth wave of the Indonesian Family Life Survey (IFLS 5). Restricting the sample to the case of whether a household decides to have a child or not allows for the model to be treated as a classification problem (binary response). The shrinkage methods and the tree-based methods do not improve the test error rate from the benchmark logistic model. Based on the result, having extended families living in a household does reduce the likelihood of the household having a child.

Introduction

- Although the demographic transition phenomena have occurred in most of the Western world, the family systems in many developing countries, such as Indonesia, differ from those in Western countries. Extended families (grandparents, aunts, uncles, cousins, or other relatives) are more likely to live together under one roof (Frankenberg, Chan, and Ofstedal, 2002), which may influence household decisions to allocate more time for work, affecting fertility decisions.
- This paper aims to incorporate the role of extended families into the GW model of couples' decisions to work, thus affecting their fertility decisions. This paper restricts the scope to only considering households deciding to have only one child to simplify the analysis. With extended families living in the same place, couples are potentially less likely to have a child since they are more likely to work.

Methods

- The household's decision to have a child (dummy for having a child C_i) is a function of having extended families (dummy for having extended families living with the household F_i) and the male-female wage ratio (WR_i). Meanwhile, $cellphone_i$ (dummy for owning a cellphone) and $internet_i$ (dummy for having internet access) are meant to capture the household's physical capital level. The binary response model can be presented as follows:

$$C_i = \alpha_0 + \alpha_1 F_i + \alpha_2 WR_i + \alpha_3 cellphone_i + \alpha_4 internet_i + \beta_k X_{ik} + \varepsilon_i$$

- Other control variables X_{ik} include the total household assets ($assets_i$), regional or geographic factors are considered by controlling households that are located in urban areas ($urban_i$ dummy) or different regions (main island dummies) across the country, as well as 4 education levels among men and women.
- The analysis utilizes the fifth wave of the Indonesia Family Life Survey (IFLS 5), conducted in 2014/2015, a longitudinal survey representative of about 83% of the Indonesian population and contains over 30,000 individuals living in 13 of the 27 provinces in the country (Straus, Witoelar, & Sikoki, 2016).
- To assess each model's performance, I split the 4,955 household data into training and test sets (60:40). The model is first estimated using a standard logistic regression as the baseline. The ridge regression shrinks less important coefficients toward zero. Meanwhile, LASSO and elastic net shrink unimportant coefficients further down to zero. Additionally, the tree-based methods divide the predictor space and predict the response for each predictor in each region. In this case, this research utilizes the classification tree (without and with pruning), bagging, and random forest to rank the predictors by their degrees of importance.
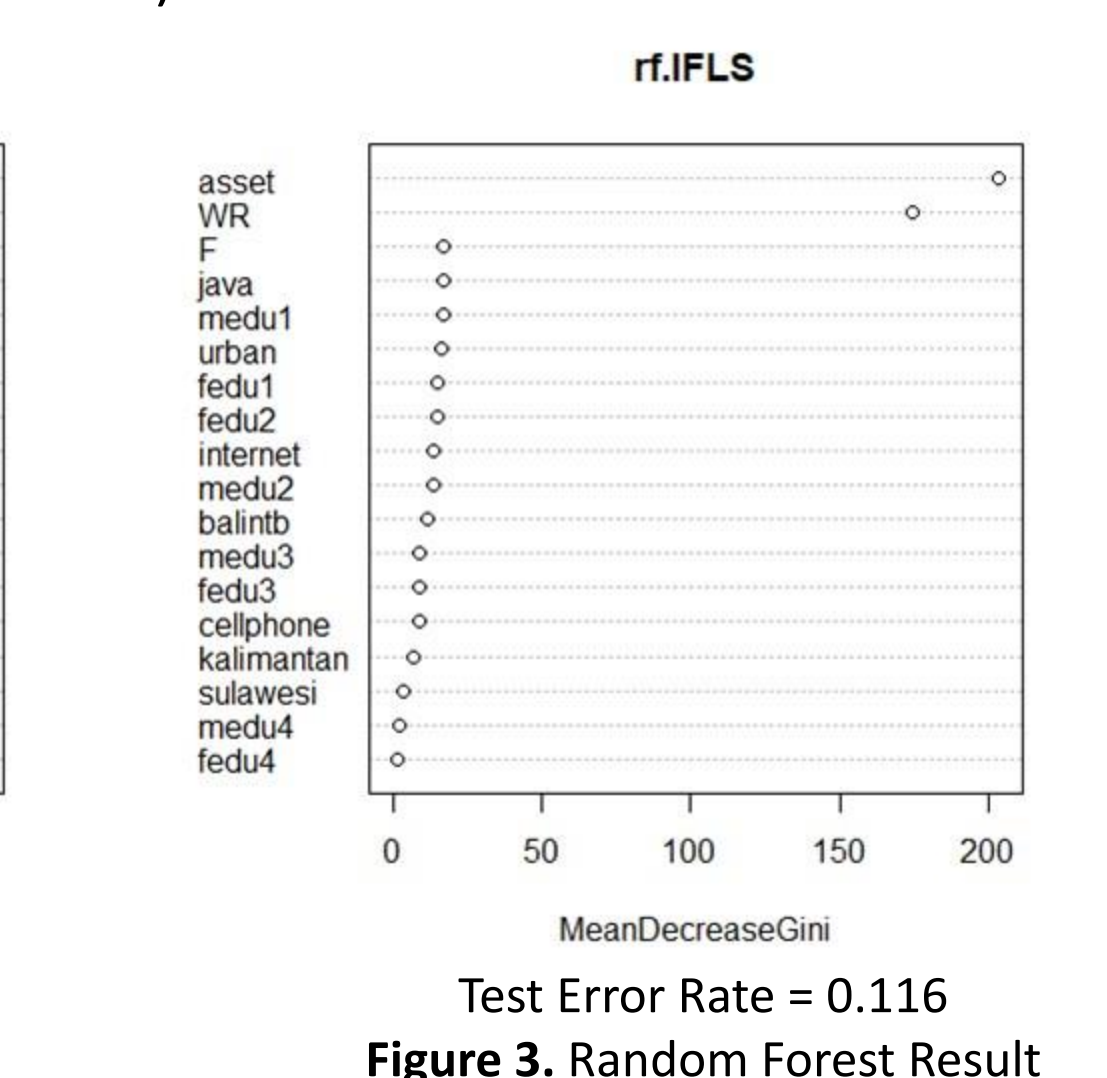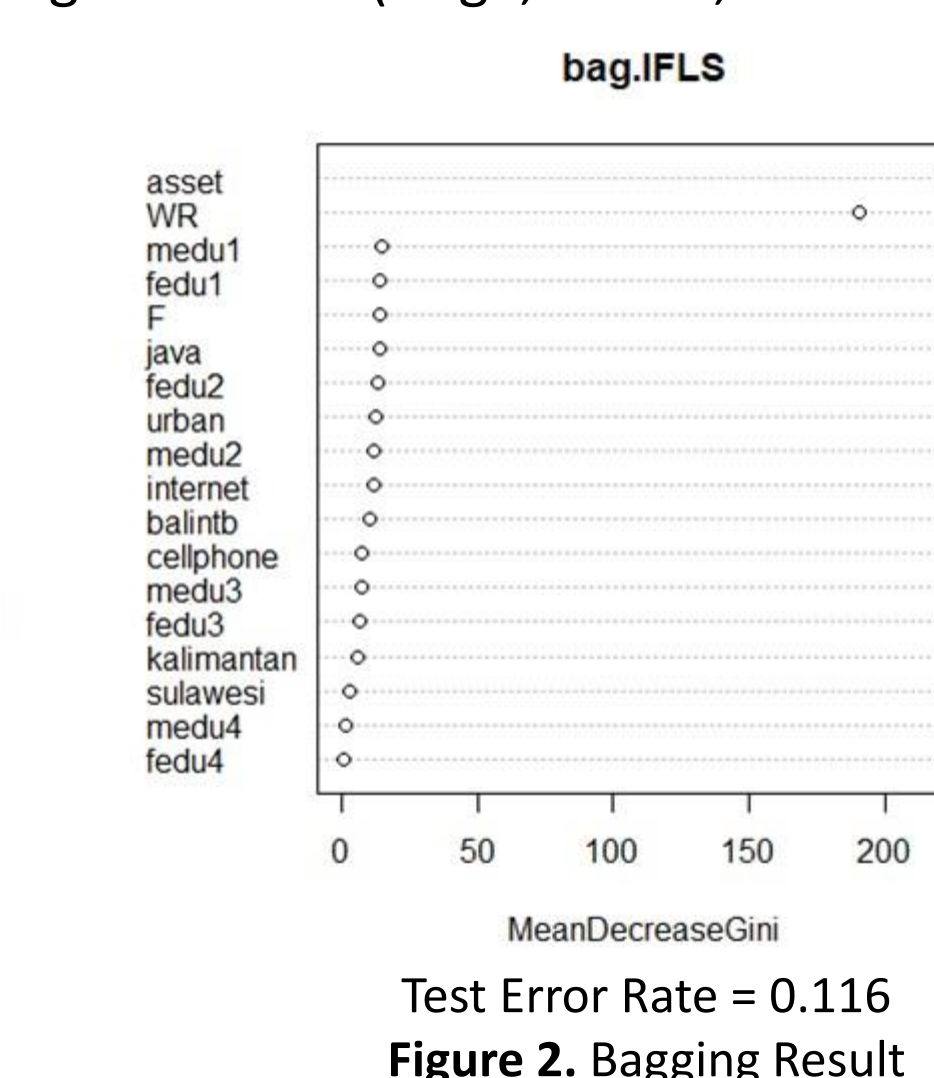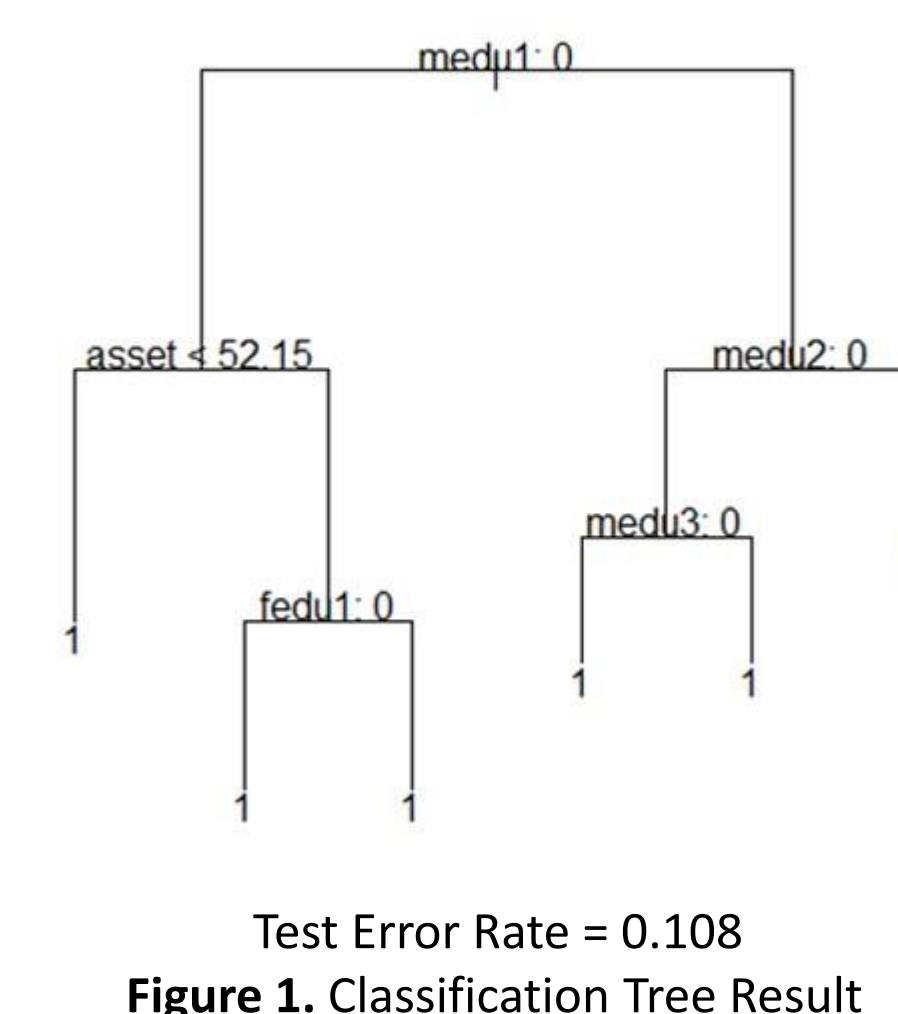
Results and Discussion

- The standard logistic regression result (baseline result) shows a positive effect of assets and a negative effect of having extended families on the likelihood of a household having a child. The presence of extended families is proven to be one of the main factors in household fertility decisions. Extended families reduce the probability of having a child, presumably because couples prefer to work more
- Higher levels of education among young households seem to increase the probability of having a child, suggesting that perhaps higher education offers higher wages, and once they can afford basic needs, only then can they consider having a child.
- Other predictors, including the wage ratio proposed by the standard GW model, appear insignificant.
- The shrinkage and tree-based methods do not seem to improve the logistic test error rate, and the results seem to be relatively consistent.

Table 1. Logistic Model and Shrinkage Methods Estimation Results

Dependent: Dummy for Having a Child (C)	(1) Logit	(2) Ridge $\lambda = 0.020$	(3) LASSO $\lambda = 0.005$	(4) Elastic Net $\lambda = 0.008$
Intercept	-0.460	0.371	0.207	0.265
Wage Ratio (WR)	0.007	0.003	0.001	0.001
Assets	0.001***	0.001	0.001	0.001
Extended Family (F)	-0.629***	-0.340	-0.335	-0.326
Urban Dummy	-0.269*	-0.186	-0.099	-0.114
Main Island Dummies				
Java	-0.129	-0.119	-0.020	-0.033
Bali & NTB (balintb)	-0.058	-0.063		
Kalimantan	-0.186	-0.151		
Sulawesi	0.391	0.340	0.196	0.229
Cellphone	-0.010	0.112		0.024
Internet	0.080	0.122	0.046	0.066
Education Level Dummies				
Male Education 1 (medu1)	1.493***	0.947	1.086	1.036
Male Education 2 (medu2)	1.191***	0.655	0.783	0.734
Male Education 3 (medu3)	0.947***	0.448	0.555	0.508
Male Education 4 (medu4)	0.234	0.077		
Female Education 1 (fedu1)	1.197***	0.828	0.881	0.860
Female Education 2 (fedu2)	0.839***	0.513	0.515	0.505
Female Education 3 (fedu3)	0.610***	0.305	0.288	0.284
Female Education 4 (fedu4)	0.545	0.248		
Training Set	2,973	2,973	2,973	2,973
Test Set	1,982	1,982	1,982	1,982
Total	4,955	4,955	4,955	4,955
Test Error Rate	0.110	0.108	0.108	0.108

Notes: For the baseline logit estimation in column (1), ***, **, and * represent significance at 1%, 5%, and 10% levels, respectively. The dependent variable is a dummy variable for household i who decides to have a child (C_i). $Assets_i$ (in millions of Rupiah) include house & land occupied by the household, other house/building (including land), land (not used for farm/non-farm), poultry, livestock/fishpond, hard stem plants not used for farm or non-farm business, vehicles (cars, boats, bicycles, motorbikes), household appliances, savings/certificate of deposit/stocks, receivables, jewelry, household furniture & utensils, and other assets. EF_i, $cellphone_i$, $internet_i$, and $urban_i$ are dummy variables for the presence of extended family (adult 15 years or older son/daughter-in-law, parents, parent-in-law, sibling, brother/sister-in-law, grandchild, grandparent, uncle/aunt, nephew/niece, cousin, servant, other family, and non-family), access to cellphones, access to the internet, and whether or not household i is located in an urban area, respectively. The geographic dummy variables ($java_i$, $balintb_i$, $kalimantan_i$, and $sulawesi_i$) correspond to the main islands where the household i is located. The education dummy variables $edu1_i$, $edu2_i$, $edu3_i$, and $edu4_i$ indicate the levels of education for both males and females in household i. $Edu0$ includes no/not yet in school, kindergarten, others, do not know, and missing; $edu1$ includes elementary school (or equivalent); $edu2$ includes high school (or equivalent); $edu3$ includes undergraduate level (or equivalent); $edu4$ includes university master's and doctoral. λ corresponds to the tuning parameter used in the three shrinkage methods (ridge, LASSO, and elastic net).

Test Error Rate = 0.108
Figure 1. Classification Tree Result

Test Error Rate = 0.116
Figure 2. Bagging Result

Test Error Rate = 0.116
Figure 3. Random Forest Result

Conclusions

Having extended families living in a household does reduce the likelihood of the household having a child. As expected, assets and education positively affect the likelihood of a family having a child. In contrast, families living in urban areas are less likely to have a child. Meanwhile, the wage ratio, the level of technology, main island fixed effects, and doctoral-level education are not statistically significant. Relaxing the restriction of considering only the case of having one child, which limits the sample to include only young households, will potentially provide a richer analysis.

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