

学位論文及び審査結果の要旨

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論文の要旨

This dissertation consists of four self-contained articles that study the causal relationships of labor economics in Taiwanese society. Chapter 1 investigates the effect of childbearing on female labor supply. Chapter 2 empirically examines the existence of a quantity-quality trade-off of children. Chapter 3 focuses on the causal relation between education and health outcomes. Chapter 4 estimates the effect of educational attainment on marriage outcome, and tests the hypothesis of incompatible pool of potential mates.

In society, women generally play the roles of mothers and employees, and those roles partly substitute each other; therefore, the contributions of women to the labor market should be considered. Chapter 1 applies the widely observed parental preference for offspring's sex as an instrumental variable for the number of children in Taiwan, and examines the causal effect of childbearing on female labor supply. American parents prefer to have both female and male children in their families. Thus, couples who only have sons or daughters intend to give birth to an additional child in the hopes of having a child of a different gender, meaning that having

same-gender children positively affects the number of children per family in the United States. Additionally, the gender composition of previous children could be a plausible instrument because of its random assignment. Conversely, Taiwanese families prefer to have at least one son; hence, parents who only have daughters often intend to have an additional child. This chapter therefore employs the gender of the first and second children as instrumental variables for the overall number of children per woman. Ordinary least square estimates reveal that childbearing is associated with a reduced female labor supply. However, after using the gender of the first and second children as instruments to account for the endogeneity of the number of children, two-stage least square estimates suggest that there is no correlation between the number of children and female labor supply.

Family resources are distributed and shared among members of a family. Therefore, holding resources constant, as the number of children in a family increases, the share of resources available for each member decreases. This is referred to as the quantity-quality trade-off of children. Chapter 2 examines the relation between the number of children in Taiwanese families and the educational attainment of those children. To identify the causal relation, our analysis operationalizes the traditional Taiwanese parental preference for male children as an instrumental variable to generate exogenous variations in the number of siblings. The sex composition of siblings is an appropriate instrument for predicting the number of children wherein the sex of children are randomly assigned and correlated with family size. Ordinary least square estimates reveal that a larger number of siblings results in lower educational attainment. As more control variables are added into the estimations, the effects of sibling size reduce, implying that unobserved factors are correlated with sibling size and may disturb the causal estimations. However, after addressing the endogeneity of the number of siblings, our two-stage least square estimates result in uncertainty regarding a trade-off between child quantity and quality within a family.

Previous studies have thoroughly investigated the relationship between education and health, with substantial evidence suggesting that individuals' educational attainment correlates with their health status and health-related behaviors. Chapter 3 refers to Taiwan's educational reforms to account for the well-known endogeneity problem of education. Notably, a substantial growth in the number of senior high schools and four-year colleges and universities began in the mid-1990s, and has led to an increase in the proportion of college graduates. Our first stage estimations determine that the number of senior high schools and four-year colleges and universities positively affects the number of years that people attend school. It particularly increases their attendance at four-year colleges and universities, which also supports the use of expansion of education as an instrumental variable for education. Multiple measures of health status are used for the estimates herein, namely self-reported health status, out of labor market because of health conditions, and body mass index (BMI) score. The instrumental variable estimates indicate a negative correlation between education and self-reported health status, but a positive correlation between education and having no work disability. Notwithstanding the causal relationship that exists between subjective or objective health outcomes and education, the instrumental variable estimates provide no evidence of education affecting BMI scores, overweightness, and obesity.

Forming a family is a crucial decision in a person's life. Decisions concerning marriage and whom to marry have been an economic question for decades. One well-known argument in the literature on marriage is the positive assortative mating in the marriage market. Using data on Taiwan, Chapter 4 empirically investigates the relationship between education and the marriage outcome. Our empirical strategy is to use the instrumental variable approach to account for the well-known endogeneity of education. Taiwan has experienced a great expansion in higher education since the mid-1990s. The rapid increase in the number of four-year colleges and universities has led to a dramatic increase in the number of college graduates. After employing

the expansion of education as an instrumental variable, we find that for both males and females, more education leads to a higher possibility of not marrying. We argue these results may be caused by the incompatible pool of potential mates. Therefore, we test our hypothesis that the educational composition of a couple conforms with educational assortative mating or with the man's education being superior to the woman's. Based on the results of multinomial logistic regressions, we find little evidence that the choice of marriage partly conforms to our hypothesis. This implies that well-educated women face a smaller pool of potential partners in the marriage market than do less-educated women, and therefore, they have a higher possibility of being single.

審査結果の要旨

本博士論文は、台湾の個票データを用いた労働経済学の論文4篇から成る。いずれも、脱落変数が引き起こす識別問題を解決するために自然実験に基づく操作変数法を用いている。第1章では、子どもの数が女性の労働供給に与える因果効果を、また、第2章では兄弟姉妹の数が本人の教育年数に与える因果効果を推定している。これらの章では、女の子よりも男の子を好む台湾の親の選好を前提とし、無作為に決まる第一子と第二子の性別を子どもの数(第1章)、及び、兄弟姉妹の数(第2章)の操作変数として用いている。二人とも女の子であれば、第三子を生むインセンティブが高まるからである。第3章では、教育年数が健康に与える因果効果を、また、第4章では教育年数が婚姻状態に与える因果効果を推定している。これらの章では、台湾の教育改革によって1990年代に急増した高校と4年制大学の数を教育年数の操作変数として用いている。以下、各章について概要、研究方法、評価を述べる。

第1章 “Childbearing and Female Labor Supply: An Empirical Study in Taiwan” は、2009, 2010, 2011年の台湾の世帯のプールドクロスセクショナルデータに操作変数法を適用し、子供の数が女性の労働市場参加と労働供給時間に与える因果効果を推定している。子どもの数は女性の労働市場参加、労働供給時間のいずれに対しても因果効果を持たないことを見出している。

第2章 “Number of Siblings and Educational Attainment: Application of Son Preference” は、1997, 2002, 2007年の台湾の個人のプールドクロスセクショナルデータに操作変数法を適用し、兄弟姉妹の数が本人の教育年数に与える因果効果を推定している。兄弟姉妹の数は教育年数に対して因果効果を持たないことを見出している。

第3章 “Education and Health Outcomes: Using Taiwanese Education Reform for Identification” は、2009, 2010, 2011, 2012, 2014年の台湾の世帯のプールドクロスセクショナルデータに操作変数法を適用し、教育年数が健康に対して与える因果効果を推定している。教育年数は、出勤率に対しては正の因果効果を、また、BMIに基づく肥満度に対しては因果効果を持たないことを見出している。しかし、出勤率とBMIに基づく肥満度のような客観的な指標の代わりに主観的健康を従属変数として用いると、教育年数の因果効果は負になることも見出している。

第4章 “More Education, Fewer Marriages: Evidence from Spousal Education” は、2009, 2010, 2011, 2012年の台湾の世帯のプールドクロスセクショナルデータ、Panel Study of Family Dynamicsに操作変数法を適用し、教育年数が生涯未婚に与える因果効果を

推定している。教育年数は生涯未婚に対して正の因果効果を持つこと、教育年数が1年増えると男性の生涯未婚率は7.9%上昇するのに対し、女性の生涯未婚率は8.9%上昇することを見出している。この男女間の違いを理解するために、個人の学歴を高卒以下、短大卒・4年制大学中退、4年制大学卒、大学院修了と区分し、どの学歴を持つ個人がどの学歴を持つ異性と結婚するか、あるいは、生涯未婚を選ぶかを説明する多項ロジットモデルを男女別に推定し、男性が自分と同学歴か一つ下の学歴の女性と結婚する傾向を見出している。

第1章、第2章、第3章を通して、明確な問題設定、既存文献との関連付け、識別問題の認識、自然実験に基づく識別戦略の策案、データの適切な選択、適切な定式化と推定、推定結果の正確な解釈ができており、質の高い論文になっている。第4章は、これらと比べ技術的な面で課題が残るものの、新たな問いに挑戦する積極的な姿勢を評価できる。また、4編の論文を含んでおり、量的にも高く評価できる。第1章と第2章は、レフェリー制の英文ジャーナル *Journal of Comparative Asian Development* と *Applied Economics Letters* にそれぞれ掲載済みであり、一定の国際的評価を得ていると考えることができる。

以上のことから、本論文審査委員一同は、本学府の博士号審査基準①に照らして、Hung-Han Lin 氏の学位請求論文 *Essays on Labor Economics: Parental Preference, Expansion of Education, and Examination of Causality* が博士（経済学）の学位を授与するに値すると判断する。

注 論文及び審査結果の要旨欄に不足が生じる場合には、同欄の様式に準じ裏面又は別紙によること。