

### 3. ワーキングプア推計の国際的動向(なぜ上記のような規定で推計するのか)

#### 3-1 EUでの議論

- ・各国のワーキングプア推計の動向をとりまとめたものとして、Peña-Casas, R. and Latta, M. (2004)がある。資料2を参照。
- ・Bardone, L., Guio, A.-R.(2005), pp.1-2
  - (ア)「労働年齢の世帯員が労働市場でどの程度活動しているかは、扶養家族の存在と相まって、個人の貧困リスクに対する脅威の重要な決定因となる。」(p.1より引用)
  - (イ)「相対的所得貧困という定義の根底にある世帯内での資源の均等分配の仮定の下では、個人の経済的福祉はすべての世帯員から提供された資源の合計に依存する。」(p.2より引用。傍点は報告者が付記。)

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- Ex. 年所得が200万円でも、世帯内に要扶養児童が二人いる場合と単身世帯ではその意味合いは異なる。
- 各国のワーキングプアの規定と推計において、労働市場での活動期間の規定は異なるが、多くは最低生活水準以下の世帯所得により貧困世帯を特定し、その世帯メンバーの労働力状態を見ている。

#### 3-2 アメリカでの議論

- ・Bluestone, B., Murphy, W.M., Stevenson, M.(1973) : Working Poor となる主な要因として、低賃金があるが、それのみではワーキングプアとはならない。(資料3参照)
- ・Klein, B.W., Ronces, P.L.(1989)の指摘(世界初のワーキングプア推計)
  - (ア)失業、フルタイムの職が見つからない、低賃金率といった労働市場問題の結果として生まれる低所得
  - (イ)要扶養児童の存在とたった1人の稼得者のような貧困に対して伝導性のある世帯構造
- ・アメリカにおいても決して統一的なワーキングプアの推計方法があるわけではない(アメリカにおけるこれまでのワーキングプア推計結果については、資料4を参照)

##### 3-2-1 連邦政府内の状況

###### a) BLS

- ・ワーキングプアを推計し続け、その結果を年間レポートとして発表している。

###### b) センサス局(Census Bureau)

- ・局自体がワーキングプアという言葉(term)を用いないことを明言。
- ・その理由として、「統計利用者が答えようとする問題から、用いるデータによってワーキングプアの意味が異なる」ことをあげている。

##### 3-2-2 現状

○ワーキングプア推計をめぐる論点は以下の三点に集約される

- (1) 最低賃金水準で働く労働者が、どの程度労働市場と接触(attachment)し、なおかつ、それらのうちどの程度が貧困であるかをめぐる論議(労働市場での活動期間をめぐる論議)
- (2) ワーキングプアの推計に用いる最低生活基準をめぐる論議
- (3) ワーキングプアを世帯として捉えるか、それとも個人として捉えるかの論議

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<(1)について>

- ・ 貧困を所得の過不足で測る場合、ある一定の所得水準が貧困か否かを決定する要因となる。Working Poorを推計する場合、世帯員の賃金水準がどの程度で、年間を通じてどれだけ働けば(労働市場での活動期間)、貧困でなくなるのかを定義しなくてはならない。
- ・ (Ex.) 夫が最低賃金水準で働いている。妻がおり、そして子供が二人いる。世帯の人数で異なる連邦貧困基準に対して、自らが属する世帯の所得が足りているのか否かを測る場合、この夫は最低賃金水準で「どれだけ働けば」連邦政府の貧困基準を上回るのか。この「どれだけ働けば」という点をめぐって、(1)の論点は展開された。
- ・ Klein, B.W.(1992), Schiller, B.(1994)・・・定義・推計結果が大きく異なる。
- ・ Wertheimer, R.(2001)：下記を基準として推計

：1996年に個人責任・就労機会調停法(The Personal Responsibility and Work Opportunity Reconciliation Act of 1996)が成立した。同法は、公的扶助を受給する者に対して就労の義務を課し、福祉依存から脱却させることを明記している。ひとり親世帯に対しては、少なくとも週20時間の労働参加(2000年までに週30時間に引き上げる)を、二人親の世帯に対しては少なくとも週35時間の労働参加を義務(work requirement)づけている

○合意は得られていない。

<(2)について>

- ・ 現在のアメリカ連邦貧困基準が低すぎるという認識から、別の貧困基準を用いてワーキングプアの推計を行っている。(1965年にOrshansky, M.の基準(食料費が全支出の三分の一を占める。1965年当時3,130ドル。現在、物価指数で更新)
- ・ 連邦貧困基準の1.5倍(Kim, M(1998), Paster Jr., M and Scoggins, J.(2007))といった基準
- ・ アメリカ連邦貧困基準は、所得水準をもとにしたものであり、資産、現物給付の価値等を含んでおらず、よって、ワーキングプアが過大推計されているとの見解。

○ 合意は得られていない。

<(3)について>

- ・ワーキングプアを個人と世帯の双方で捉えるようになってきている。最低限、世帯所得によって貧困を判断。労働市場での活動期間の基準を設ける場合には、世帯メンバーの労働時間数、労働週数がその対象となっている。
- ・個人のワーキングプアとワーキングプア世帯を捉えたものとして Acs,G., Phillips, K.R, McKenzie, D.(2000), Paster Jr., M and Scoggins, J.(2007)
- ・Klein, B.W, Rones, P.L.(1989)のワーキングプア推計方法は、カナダやフランスの研究者、機関によって採用され、各国のワーキングプア推計が行われている。

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- ☆ 最低限、貧困状態を世帯所得で判断。そこから世帯員個々人の労働市場での活動を見る場合は、個人単位で捉えるという一定の合意。
- ☆ この方法は、結果を政府が発表しない限り、集計データからは推計が困難。マイクロデータを用いて推計するしかない。

#### 4. 日本のワーキングプアの(再)推計方法と(再)推計結果について

##### 4-1 ワーキングプア規定の原則

- 岩井・村上(2007a)(2007b)(2007c)で提示した日本のワーキングプア規定の原則を本報告でも踏襲する。
  - ① 貧困であるか否かを世帯所得と世帯の最低生活基準の比較によって行い、貧困世帯を特定する。
  - ② 貧困世帯に属しており、通常(3ヶ月以上)労働市場で活動(就業・失業<求職>)している個人をワーキングプアと規定する。
- 理由は先の2, 3内で述べたとおり。(年所得200万円未満の個人をワーキングプアとはしない。世帯内に稼働者が少なくとも一人いる貧困世帯もここではワーキングプアとはしない)

##### 4-2 岩井・村上(2007a)(2007b)(2007c)の最低生活基準に対する批判とその検討

- 岩井・村上(2007a)(2007b)(2007c)の最低生活基準算定方法
  - 世帯内における15歳以上人数と15歳未満人数のマトリックス(生活扶助第一類と第二類のみで基準を算定)
- 駒村(2008)の指摘
  - ① 貧困の判断のために用いる生活保護基準が、生活扶助第一類と第二類の合計のみで算定されており、各種加算・扶助が考慮されていない点に問題
  - ② 認定所得の問題:生活保護受給の際には、当該世帯の収入合計から控除(勤労・基礎), 税, 社会保険料等を除いた収入額が認定される。この収入額と生活保護基準額が比較され、その差額が支給される。
- 最低生活基準の規定

- a) 出来る限り世帯の状況に合わせて扶助・加算を算入
- b) 用いるデータ(『就業構造基本調査』リサンプリングデータ, 1992, 1997, 2002年)から判別できる限りにおいて, 生活扶助第一類と第二類以外の, 各種の扶助・加算を算入
- c) 生活扶助第一類額についても年齢階層別に設定
- d) 認定所得については, 『就業構造基本調査』にある世帯所得データがカテゴリカルデータであることから, 取り扱えなかった。世帯貧困率, ひいては, 結果として表れるワーキングプアの規模が過小であることや, その構成に歪みがあることは否めない。

- 最低生活基準の具体的算定方法(下図参照 生活保護手帳, 各年版より)
  - 生活扶助+住宅扶助+教育扶助+老齢(老人)加算+母子加算=基準額とした。
  - データから判断できる限りにおいて, より細やかに基準を設定した。(例えば, 医療扶助については傷病等の情報がデータにないため算入の判断が困難)

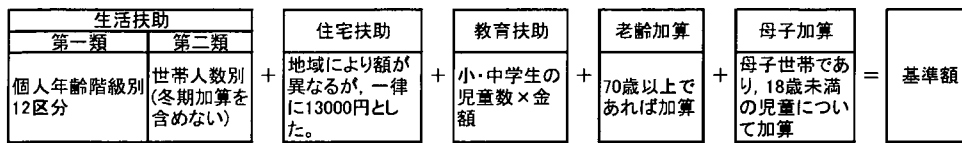


図 最低生活基準に含めた各種の扶助と加算

#### 4-3 労働市場での活動の規定-労働市場での活動の規定-

##### 4-3-1 岩井・村上(2007a)(2007b)(2007c)の労働市場活動の規定に対する批判とその検討

- 岩井・村上(2007a)(2007b)(2007c)の労働市場での活動の規定
  - 3ヶ月以上という労働市場での活動期間(有業者・無業者<求職活動をしている>)のみがその対象
- 推計結果に, 学生など, 労働市場での活動が主でない層が含まれる点に問題があるという指摘
  - 例えば伍賀(2007):自ら労働時間を調整した結果, 低所得となっている層を推計から省く必要性を指摘
- +
- 福原(2008)の議論
  - 「アメリカのワーキング・プアの定義には貧しい失業者が含まれるのに対して, 欧州連合では「失業貧困者」と「ワーキング・プア」を区別し, 両者をあわせてアクティブ・プアと呼んでいる。このような定義の相違は厳密さへの関心度が異なるというよりは, 多くの EU 加盟諸国では①失業率が高く長期失業者が相対的に多いこと, また②雇用保険とは別に政府拠出による失業手当制度などがあることから, 失業問題について固有の政策論議が必要とされることによる。日本につ

いては、以前に比べ失業率が上昇し、長期失業による貧困も無視しえないため、失業貧困と低所得による貧困との区別を重視するのが妥当だろう」(p.5)

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○ 労働市場での活動の規定

- ▶ 3ヶ月以上労働市場で活動するという「活動の期間」を基本に、以下の処置を行った。
  - ① 学生を除く(分子・分母双方から)
  - ② 仕事の主従のうち「主に仕事」の層を対象とする(分子・分母双方)
- ▶ 福原(2008)の指摘については、考慮の必要がある。基本的に本報告推計の対象となる層は、福原(2008)の言うアクティブ・プアであり、それを失業貧困者とワーキングプアに分けることは可能。失業率の高まり・長期失業者の増加はあるが、福原(2008)の言う②については、日本に当てはまるか否かについて議論の余地があるだろう。

5. 推計結果

○ 尺度

- ・ 失業・就労貧困率 =  $\text{ワーキングプア} \div (\text{ワーキングプア} + \text{非ワーキングプア}) \times 100$
- ・ Poverty Share: ワーキングプア内部での各項目の構成比(ワーキングプア総数を100とする。)
- ・ 「学生を除いた失業・就労貧困率」と「学生を除き仕事が主な者を対象とした失業・就労貧困率」をグラフ化し、左右に並べて掲載している(資料 p.6~)。

5-1 ワーキングプア(学生を除く)の規模と構成(全体表: 資料5参照)

- ・ 失業・就労貧困率: 学生を除いているため、岩井・村上(2007a)(2007b)(2007c)の結果よりも低くなっている。
- ・ 総数:
  - ▶ 1992年【3.7%(男性3.0%, 女性4.7%)】、1997年【3.9%(男性3.1%, 女性5.0%)】、2002年【6.2%(男性5.2, 女性7.5%)】
  - ▶ 全体では、男性よりも女性の失業・就労貧困率が高い
- ・ 年齢別: (図1参照)
  - ▶ 若年層(15~24歳, 特に男性)の1997~2002年の間での急増
  - ▶ 高齢層・中高齢女性で失業・就労貧困率が高い(最低生活基準に母子加算・高齢加算を含めたためだと考えられる。)
- ・ 学歴別: (図2参照)
  - ▶ 明確な学歴間格差。学歴が低いほど失業・就労貧困率が高い。
- ・ 従業上の地位別: (図3参照)

- 日雇、雇人なし自営業主で失業・就労貧困率が高い。
- ・ 雇用形態別：(図 4 参照)
  - 正規の職員とそれ以外(パート・アルバイト・派遣職員・嘱託)との格差
- ・ 従業員規模：(資料 pp.3-4, 資料 5 参照)
  - 明確な従業員規模別格差。従業員規模が小さいほど失業・就労貧困率が高まる。

## 5-2 仕事が主の者を対象としたワーキングプア(全体表：資料 pp. 4-5, 資料 6 参照)

- 失業・就労貧困率：学生を除いた表(資料 5)と比較すると、失業・就労貧困率はそれほど大きく下落していない。
- ・ 総数：
  - 1992年【3.4%(男性2.9%, 女性4.5%)】、1997年【3.7%(男性3.0%, 女性4.9%)】、2002年【5.9%(男性5.0, 女性7.5%)】
- ・ 年齢別：(図 5 参照)
  - 若年層(15～24歳、特に男性)の急増をここでも確認できる。
- ・ 学歴別：(図 6 参照)
  - より鮮明になった(特に女性において)学歴間格差。学歴が低いほど失業・就労貧困率が高い。
- ・ 従業上の地位別：(図 7 参照)
  - 全体的に(各従業上の地位において)女性の失業・就労貧困率が上昇した。
- ・ 雇用形態別：(図 8 参照)
  - 正規の職員とそれ以外(パート・アルバイト・派遣職員・嘱託)との格差がより鮮明な形であられるようになった。
- ・ 従業員規模：(資料 pp.4-5, 資料 6 参照)
  - 明確な従業員規模別格差。(資料 5 に同じ)

## 6. まとめと課題

- 世帯所得と個人の労働力状態をリンクさせる形でワーキングプアを規定し、学生を除き、仕事が主なものを対象に推計。
  - 男女間、学歴間、就業・雇用形態間、従業員規模間での違い。正規の職員とそれ以外で大きな違いが出ている。(ワーキングプアの増大は、少なくとも非正規雇用の増大とパラレル)
  - 若年層のワーキングプアの急増、雇人なし自営業主の貧困率の高さ
- 上記の特徴は先進諸国共通のものなのか否か。(国際比較(<課題>進行中。)
- 2007年の状態はどうか(<課題>マイクロデータの提供がまだ。)
- 流動化する層をどう捉えるか(就調は5年毎。この間の変動。そもそも漏れはないか。)

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# Labor Supply Behavior of Japanese Husbands and Wives

Koyo, Miyoshi\*

## Abstract

This paper analyzes labor supply behaviour for Japanese married men and women taking account for their joint decision. The estimation results by simultaneous tobit implies that Japanese wives reduce their labor supply when husbands increase their labor supply while husbands do not change their labor supply regardless wives' labor supply. According to estimation results, both increase in wages of husbands and wives reduce wives' labor supply while increase in wages of husbands increase husbands' labor supply.

**Keywords:** Simultaneous Tobit, Labor Supply

**JEL Classification Number:** J16 J22

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# 1 Introduction

OECD (2008) devotes a chapter for the discussion surrounding Japanese labor market, where the population of the working-age group has rapidly decreasing<sup>1</sup>. OECD (2008) points out it is necessary to increase labor input from females to cope with population aging trend because Japanese females have stronger tendency to leave the labor market than in any other developed country when they marry (OECD (2002)). Although many females return to labor market after withdrawal at the marriage, many of them don't choose to work full time. The proportion of females who work part-time is one of the highest in OECD countries at 41% (OECD (2008)).

The aim of this paper is to examine what discourage Japanese married female from working. To achieve this aim, this paper follows Lundberg (1988) who analyzes labor supply behaviour of U.S. married couples taking account for possibility that their decisions are jointly determined. Labor supply functions for husbands and wives are estimated using simultaneous Tobit (model 4 in terms of Maddala (1983), explained in detail by Matsuura and McKenzie (2009)).

Compared to existing empirical studies of Japanese married female labor supply, for example, Hill (1989), Higuchi (2001), Takeuchi (2004), and Ma (2007), this paper has following features. The estimation method used in this paper takes account of the possibility that both wife's labor supply and husband's labor supply are simultaneously determined, unlike previous studies which assumes husband's labor supply is predetermined.

The empirical results can be summarized as follows. Husband's market work reduces wife's market work while wife's market work does not affect husband's market work at least according to the results for pooled whole sample. Wage effects differ: both wages of husbands and wives affect wives' labor supply negatively while husbands' wages affect husband's labor supply positively.

The remainder of this paper is as follows. Section 2 explains the empirical model, the data and the characteristics of hours of work and housework of each married couple in our sample. Section 3 presents the empirical results, and Section 4 contains a conclusion.

## 2 Model

There are a lot of studies which analyze a family joint labor supply behaviour, both theoretically and empirically. Chiappori (1988) introduces a sophisticate approach which eases an assumption that there is one only decision maker. Chiappori (1988) assumes there are not one but two decision makers (typically, a husband and a wife)

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<sup>1</sup>According to Japanese National Institute of Population and Social Security Research, the share of the population of the working-age group has been declining and will be below 60% in 2020.

cooperate each other so as to maximize each other utility. However, empirical researches in this setting like van Soest (1995), or Blundell et al. (2007) must make some restriction to estimate. This paper uses much more simpler approach.

This paper uses follows Lundberg (1988) who analyzes labor supply behaviour of U.S. married men and women treating each spouse's labor supply as endogenous.

This paper assumes a family consists of a husband and a wife maximize following utility function. Each member of couple maximize

$$U_i(T - h_i, C), \quad (1)$$

where  $h$  represents hours of market work and  $C$  represents consumption of the family. In this sense, a family is assumed to share their consumption. A subscript  $h, w$  represents a husband and a wife.

Each family faces following budget constraint,

$$C \leq Y + w_h h_h + w_w h_w + H(T - h_h, T - h_w) \quad (2)$$

where  $w$  represents each wage and  $Y$  represents a couple's non-labor income. A function  $H$  represents a household production function. Hereafter, this paper denotes the budget constraint above as  $B(h_h, h_w, \cdot)$ . Because the model is static in this paper, so

$$C = B(h_h, h_w, \cdot) \quad (3)$$

Each member of a couple chooses hours of work to maximize above utility, so their reaction functions of hours of work  $h_h^*, h_w^*$  are

$$\begin{cases} h_h^* = \arg \max_{h_h} U_h(T - h_h, B(h_h, h_w^*, \cdot)) \\ h_w^* = \arg \max_{h_w} U_w(T - h_w, B(h_h^*, h_w, \cdot)) \end{cases} \quad (4)$$

where  $\bar{H} \geq h_i^* \geq 0$  ( $i = h, w$ ).

This paper assumes following closed linear labor supply reaction function,

$$H_h^* = \alpha_h + \gamma_h H_w^* + \delta_h Z_h + \beta_h^h w_h + \beta_h^w w_w + \epsilon_h, \quad (5)$$

$$H_w^* = \alpha_w + \gamma_w H_h^* + \delta_w Z_w + \beta_w^h w_h + \beta_w^w w_w + \epsilon_w, \quad (6)$$

$$H_i = \begin{cases} H_i^* & \text{if } H_i^* > 0 \\ 0 & \text{if } H_i^* \leq 0 \end{cases} \quad i = h, w, \quad (7)$$

where  $H$  represents hours worked,  $w$  represents market wages, and  $Z$  represents other variables which affects their preferences for leisure, or a productivity in household production such as number of children or non-labor income.

Because this paper assumes a couple share their consumption completely, it is necessary to use variables which affect not productivity (and consumption) but taste for identification. This paper uses information of parents of each member of a couple. First, this paper uses each parent's age to take account for the possibility that a taste of each member of couple is affected by his/her parent's taste varied by cohort. Second, this paper uses information of parent's job at each member of a couple is 15 years old to take account for the possibility that the memory of childhood affect his/her taste.

This paper estimates those equation by two-step simultaneous tobit. Generated regressor problem is removed by variance correction proposed by Murphy and Topel (1985) which explained by Matsuura and McKenzie (2009) in detail. To estimate, this paper regresses hours of work on whole exogenous explanatory variables as explanatory variables by Tobit in the first step. In the second step, (5) and (6) will be estimated using predicted hours of work obtained by the result of the first step as an explanatory variable.

Explanatory variables,  $Z_i$ , includes the variables proxy taste for leisure/consumption or productivity in household production. This paper uses following variables. First, to take account for child care which is large part in housework, the number of children are used as explanatory variables. Hours of child care can be thought to be decreasing as a child gets older, the number of children aged 0-2, the number of children aged 3-5, and the number of children aged 6-18, are defined separately. Second, to take account of the possibility that co-residence with parent who help housework decrease an individual's hours of housework, dummy variables which denote whether the individual live with his/her parent or not are defined as explanatory variables.

To take account of the possibility that hours of housework depend on size of dwellings and households, both number of rooms and number of households are defined as explanatory variables. To proxy non-labor income, variables which proxy each couple's wealth level, saving, securities, liabilities and income not earned by a couple are also used as explanatory variables.

To estimate above labor supply reaction function, it is necessary to obtain market wage regardless an individual works or not. To obtain market wage, this paper uses an auxiliary regression for wages in standard settings and uses imputed wage for all individuals. This paper uses an individual's education level, and work experience as proxy variable of human capital accumulation which affects market wage level following Mincer (1985). In order

to measure an individual's education level, this paper uses the following schooling dummy variables, junior high school dummy, 2-year college dummy, and university dummy, as proxy variables for education. As a result, senior high school is the base level of education. To take account of possibility that wages rise with job seniority, as Topel (1991) pointed out, this paper distinguishes work experience as a whole, denoted by *Exp*, and work experience in the current work place, denoted by *Tenure*<sup>2</sup>.

This paper utilizes data from the Keio Household Panel Survey (KHPS) conducted by Keio University from 2005 to 2009. Kimura (2005) contains details of the sampling methods used to obtain KHPS and the sample characteristics of KHPS. The first wave of KHPS, KHPS2004, sampled about 4000 households with respondents who were aged between 20 and 69, and includes married and unmarried males and females. This KHPS contains not only respondent information but also spouse's respondent information. This feature enables us to estimate labor supply functions using spouse's information. Descriptive statistics is summarized in Table 1.

### 3 Estimation Results

Estimation results are summarized in table 2. In this table, the estimation results for whole couples are shown in columns [1] to [2], for couples with children aged 0-18 in columns [3] to [4], and for couples without children aged 0-18 in columns [5] to [6].

It should be noted parents' information, which is necessary for an identification, affects labor supply and the fathers' effects and mothers' effects differ. For wives, the younger their father, the less they work while the younger their mother, the more they work. Husbands' labor supply seem not to be affected by their parent's ages.

The factors that affect the labor supply differ between husbands and wives. For example, the saving and income not earned by the couple significantly decreases labor supply for wives regardless the couple has a child, but not for husbands. The effects of having children on labor supply differ between husband and wives, and differ with age of children. The number of children aged 0-2 and 3-5 significantly reduce wives' labor supply. The variables proxy Non-labor income like liabilities, securities, saving, or income not earned by couple significantly affect both couple's labor supply, but the magnitude differs between husbands and wives. In general, the effect is larger for females than males, except for liabilities which positively affect husband's labor supply while not for wife's.

The effects of wages also differ. Increase in husbands' wage reduce wives' labor supply while increase husbands' labor supply. Increase in wives' wage reduce both husbands' and wives' labor supply.

According to estimation results, although husband's market work reduces wife's market work, wife's market work does not affect husband's market work. In contrast, wife's housework increase husband's market work, husband's

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<sup>2</sup>The auxiliary regression results are omitted.

housework does not affect wife's market work.

## 4 Conclusion

The empirical results can be summarized as follows. Although husband's market work reduces wife's market work, wife's market work does not affect husband's market work. The effects of wages differ. Increase in husbands' wage reduce wives' labor supply while increase husbands' labor supply. Increase in wives' wage reduce both husbands' and wives' labor supply.

There are two channels which a wife's decrease in hours of market work affects the utility of husband. First channel is a decrease in a labor market income of a wife caused by a wife's decrease in hours of market work. Second channel is an increase in a household production caused by a wife's decrease in hours of market work. The estimation results here implies these two channel is mixed and cannot be observed effects. When a wife's wage increases, both two channels seems to increase the utility of a husband.

These results imply that husbands tend to specialize themselves in market work while wives tend to specialize themselves in housework in Japan. The possible reasons of this tendency are as follows. First, Japanese gender gap in pay is the largest among developed developed countries (See Mincer (1985), Jacobsen (1998) Blau and Kahn (2003), and Miyoshi (2008)). Second, the productivity of housework for husbands may be lower than that of wives. In Japan, husbands were not taught "home economics" which was a subject about how to do housework before 1991 in junior high school.

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Table 1: Descriptive Statistics

	Mean	Std.err
Number of Children 6-18	0.95	1.00
Number of Children 3-5	0.19	0.44
Number of Children 0-2	0.13	0.37
Number of Household	3.97	1.27
Saving (10 thousand yen)	596.55	899.36
Securities (10 thousand yen)	142.67	601.50
Liabilities (10 thousand yen)	834.30	1273.47
Number of Room	5.42	2.00
Income not earned by the couples (10 thousand yen)	55.10	274.29
Live With Husband's parent	3.9%	
Live with other parent	11.1%	
Age of Husbands	45.23	8.75
University (Husbands)	38.5%	
Other School (Husbands)	9.9%	
Junior High (Husbands)	4.8%	
Work Exp (Husbands in 1/10 years)	2.36	0.95
Tenure (Husbands in 1/10 years)	0.99	1.17
Hours worked in a week (husbands)	49.36	12.55
Wage Rate (hourly, yen husbands)	2717.56	1617.11
Age of Wives	43.01	8.26
University (Wives)	15.8%	
Other School (Wives)	31.6%	
Junior High (Wives)	3.0%	
Work Exp (Wives in 1/10 years)	1.35	0.84
Tenure (Wives in 1/10 years)	0.21	0.52
Hours worked in a week (wives)	17.77	17.55
Wage Rate (hourly, yen Wives)	1891.55	2556.82

Notes:

(1) Source: KHPS2004-2009.

Table 2: Estimation Results: Labor Supply Response Function: Tobit

	Whole		With Children		Without Children	
	Wives	Husbands	Wives	Husbands	Wives	Husbands
Spouse's hours of working	-0.563** [0.246]	0.009 [0.047]	-0.326 [0.295]	0.072 [0.054]	-0.234 [0.259]	-0.064 [0.088]
Imputed Husband's wage	-0.003*** [0.001]	0.001*** [0.001]	-0.004*** [0.001]	0.001 [0.001]	-0.003* [0.002]	0.003*** [0.001]
Imputed Wife's wage	-0.006*** [0.001]	-0.002*** [0.001]	-0.009*** [0.002]	-0.002* [0.001]	0.003 [0.002]	-0.001 [0.001]
Own Father's birth year	-0.380** [0.153]	0.032 [0.069]	-0.523*** [0.182]	0.055 [0.091]	-0.578** [0.261]	0.088 [0.129]
Own Mother's birth year	0.504*** [0.178]	0.028 [0.081]	0.331 [0.211]	-0.004 [0.102]	0.957*** [0.321]	-0.016 [0.153]
Own age	-0.101 [0.182]	-0.257*** [0.078]	0.188 [0.215]	-0.170* [0.099]	-0.364 [0.303]	-0.454*** [0.146]
Own Farther's Job Self Employee	6.498 [4.125]	-0.135 [1.439]	11.428** [4.864]	2.773* [1.637]	- -	- -
Own Farther's Job Self Employed Profession	4.856 [7.261]	5.471 [5.655]	-0.331 [21.286]	5.839 [5.334]	3.07 [6.213]	-7.936*** [3.049]
Own Farther's Job Family Worker	17.920*** [5.449]	-0.706 [2.018]	21.603*** [6.223]	1.331 [2.446]	1.487 [9.418]	-6.860* [3.682]
Own Farther's Job Employed	6.222 [4.081]	-0.319 [1.382]	12.567*** [4.783]	1.239 [1.557]	0.354 [6.220]	-5.044* [2.785]
Own Farther's Job Work at Home Job	-32.063*** [11.141]	-9.108*** [2.677]	-24.891** [11.583]	-10.003*** [3.059]	-14.748 [8.971]	-12.816*** [3.834]
Own Farther's Job Contract for Work (Ukeoi)	-4.324 [5.351]	-4.499* [2.594]	9.195 [6.182]	4.193 [3.798]	3.55 [6.968]	-3.496 [3.589]
Own Farther's Job Not in Employed	4.775 [4.472]	-0.911 [1.656]	10.734** [5.301]	0.313 [1.882]	- -	- -
Own Mother's Job Self Employee	7.404 [6.587]	-8.386*** [3.056]	11.679 [12.604]	5.909 [6.124]	- -	- -
Own Mother's Job Self Employed Profession	-1.084 [10.848]	-13.180** [6.286]	-5.577 [24.678]	0.489 [8.038]	3.312 [8.066]	-15.755*** [4.311]
Own Mother's Job Family Worker	10.37 [6.450]	-9.364*** [3.069]	10.296 [12.532]	3.499 [6.143]	9.974 [7.772]	-14.380*** [4.279]
Own Mother's Job Employed	13.181** [6.450]	-10.419*** [3.047]	12.916 [12.343]	2.86 [6.070]	11.814 [7.751]	-15.011*** [4.387]
Own Mother's Job Work at Home Job	2.336 [6.863]	-10.737*** [3.163]	2.226 [12.546]	3.694 [6.180]	6.675 [8.900]	-19.572*** [4.603]
Own Mother's Job Contract for Work (Ukeoi)	21.052*** [7.723]	-16.847*** [3.762]	16.678 [13.056]	1.732 [6.613]	10.522 [7.993]	-16.921*** [4.198]
Own Mother's Job Not in Employed	12.157* [6.457]	-10.390*** [3.008]	11.803 [12.349]	2.946 [6.031]	- -	- -
Live with Husband's parent	6.240** [2.954]	-1.265 [1.422]	5.853* [3.325]	-1.534 [1.668]	1.622 [5.440]	-1.403 [2.865]
Live with Wife's parent	3.065 [1.983]	-0.798 [0.940]	4.764** [2.419]	-0.223 [1.172]	-2.562 [3.180]	-2.682 [1.662]
Number of room	0.209 [0.365]	-0.545*** [0.164]	0.890* [0.498]	-1.060*** [0.212]	0.08 [0.567]	0.254 [0.295]
Number of household	1.181 [0.732]	0.269 [0.332]	0.841 [1.000]	0.174 [0.489]	1.488 [1.005]	0.645 [0.531]
Num of Children 6-18	-1.535* [0.908]	1.169*** [0.409]	-0.18 [0.157]	-0.025 [0.064]	- -	- -
Num of Children 3-5	-12.728*** [1.785]	0.441 [0.957]	-0.288*** [0.101]	0.089** [0.045]	- -	- -
Num of Children 0-2	-16.907*** [2.227]	-1.128 [1.125]	-2.451* [1.305]	1.304** [0.614]	- -	- -
Securities	-0.235* [0.135]	-0.095** [0.046]	-9.522*** [2.037]	1.659 [1.022]	-0.298 [0.193]	-0.198** [0.089]
Savings	-0.159** [0.079]	0.019 [0.034]	-12.712*** [2.339]	0.1 [1.160]	0.09 [0.117]	-0.006 [0.057]
Liabilities	-0.013 [0.045]	0.034* [0.020]	-0.073 [0.061]	0.072*** [0.025]	0.066 [0.070]	-0.019 [0.040]
Income earned by other couple	-0.897*** [0.272]	-0.212** [0.106]	-1.102*** [0.280]	-0.27 [0.291]	-0.648* [0.343]	-0.203 [0.146]
Rivers-Vuong Test	-2.26**	-0.86	0.84	2.47**	-1.06	-0.24
Observations	2312		1615		697	

**Notes:**

(1) Standard errors are in brackets.

(2) \*, \*\*, \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

(3) Coefficients of the regional dummies and constants are not reported.

(4) Middle two column reports the estimation result for the sample with pre-school children and right two column reports the result for the sample without pre-school children.

# Does Health Status Matter to People's Retirement Decision in Japan?: An Evaluation of "Justification Hypothesis" and Measurement Errors in Subjective Health

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## 1 Introduction

The Japanese society has been facing a rapid aging and a decrease in a birthrate for the last couple of decades. The large shortage of workforce will be one of the most critical socio-economic issues. Lately, numbers of health economists focus on the relation between health status and job continuation around retirement age, since healthy elderly persons are expected to offset the lack of labor force. Health status is often one of major reasons for the retirement of workers in Japan. For example, the basic statistics based on the data using in this study shows that bad health and/or deteriorating health is the second significant reasons for males and females to leave the labor market which follows the mandatory retirement by the employers and the retirement after marriage, respectively (Table 1). However, since self-reported health status which is sometimes unreliable would cause statistical bias, we have to use this variable very carefully in econometric analysis.

This study identifies the significance of the endogeneity biases in the estimated health effects. We address the biases arose from the following two sources: (1) "justification hypothesis," wherein retired respondents are assumed to justify their leaving labor force (e.g. early retirement) by false poor health (Chirikos and Nestel, 1984; Anderson and Burkhauser, 1985; Bazzoli, 1985; Bound, 1991; Waidmann et al., 1995; Dwyer and

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Mitchell, 1999), and (2) classical measurement errors in the health variables. If the hypothesis holds true, poorer health is more frequently reported by the retired respondents, all other things being equal. Hence, health effects on labor market participation can be overestimated, as opposed to the attenuation bias of the measurement error.

Since the retirement age of Japan is much higher than other countries, “justification hypothesis” may be more applicable to this nation. However, only a few works (Iwamoto, 2000; Oishi, 2000) have tackled this problem previously. Iwamoto (2000) and Oishi (2000) compare the effects of several health indicators on wage income, labor market participation, and retirement behavior, controlling for the endogeneity bias. Both studies find the different health effects between those measurements. In particular, Iwamoto (2000) points out that subjective health indicators (self-rated health and presence of work limitations) have more obvious effects on income and employment status than objective ones, suggesting that the measurement error in subjective health is not so severe that researchers can use it in empirical analysis. However, this clearer effect of subjective health itself may be an evidence of the severity of the justification bias.

This study therefore evaluates the endogeneity biases by the following three strategies: (1) comparing the properties and effects on employment status of various health measurements, (2) using three instrumental variables (IVs) for health status that have never been used in previous studies, and (3) analyzing a relation of seemingly unrelated variables to verify “justification hypothesis.” We use several kinds of health measurements such as binary subjective health (self-reported poor health and limitations of daily activities at home and/or on the job), number of chronic diseases which have not been completely recovered by the latest timing of the survey, and our original health status scoring based on principle component analysis. Our IVs are distance in a straight line from respondent’s home to the nearest low-volume hospital, variations in the number of clinics among different medical spheres, and a body mass index (BMI) in respondent’s 30 years of age. First, we mainly evaluate how the results differ between objective and subjective health measures. Since the objective health is generally less affected by the justification behavior and measurement errors, its bias should be smaller than subjective one. Second, compared to being not-instrumented, instrumented health effects will decrease if people actually justify their unemployed status by poor health and will expand if the measurement error is a serious problem in a model. Finally, we examine the relation between the ratio of the retirement due to bad health status and a job openings-to-applications ratio. If “justification hypothesis” makes sense, those variables can be correlated because the respondents who retired in the period of the high job openings ratio may be more likely to justify their retirement by false poor health.

In this study, we apply a Japanese version of Health and Retirement Survey conducted by the National Institute of Population and Social Security Research in 2008 and 2009, which was funded by a research grant from the Ministry of Health, Labor and Welfare. The survey focuses on those who are around retirement age and includes detailed information on various objective and subjective health conditions, retirement behavior, job status, working hours, and financial status.

As a result, we obtain several evidences for “justification hypothesis” and the measure-