齢化率は9.2%で、日本が老人保健制度を制定した1982年の高齢化率9.6%に近接している。しかしながら、韓国では日本が実施した老人保健制度に関する議論よりは、むしろ日本が2000年に実施した介護保険制度への関心がより高い。すなわち、日本の老人保健制度は韓国の政策立案者や研究者に強いインパクトを与えなかったのである。その理由としては①日本の老人保健制度の実施過程で様々な問題点が発生したこと、②韓国の医療保険組合が2000年に一つの組合に統合され、日本のように制度間の財政的な調整をする必要がなかったこと、③儒教的な思想が日本より強く残っており、自分の親の面倒は自分が見るという意識が根強く残っていたこと、④政府も儒教的な思想を最大限利用し、政府の負担を最小限しようとしたことなどが挙げられる。実際、日本の老人保健制度は①高齢者の医療費について、高齢者自身の負担と若人による負担の分担のルールが明確ではないこと、②運営主体は市町村となっているが、実質的な費用負担者は国保、被用者保険の各保険制度となっているため、制度運営の責任主体が明確ではないという問題点が指摘されている。さらに、高齢者に対する医療費負担を医療保険組合へ均一に配分しただけで、高齢者に対する医療費給付を抑制する効果はほぼなく、高齢者に対する財政的な支出を最小限に抑制しようとする韓国政府にとっては望ましくない制度であった可能性が高い。

表12は高齢者における年齢階級別の所得源を示したもので、公的年金が所得源の一つであると回答した高齢者の割合は全体の13.9%に過ぎなく、まだ公的年金が高齢者の主な所得源として定着していない韓国の状況をよく説明している。韓国における国民年金制度は1988年から実施されており、老齢年金の満額給付の本格的な支給は2008年から行われた。すなわち、親戚や知人による補助金を利用している高齢者は全回答者の76.9%を占めており、政府からの交通手当を除けば最も多くの高齢者が利用している所得源であることが分かる。更に、年齢階層が高くなるほど親戚や知人への所得依存度が高くなっており、公的年金の給付面が未だに成熟していない韓国においては、子女からの仕送りは高齢者の大きな生活財源としての役割を果したのである。このような現状は国の財政的な負担を抑える役割をし、日本の老人保健制度に対する否定的な立場と医療保険組合の統合によって財政的な調整が必要で

はなかった点とともに老人医療保険制度の議論を抑制する要因として作用したのである。

一方、高齢化率の上昇とともに老人医療費の継続的な増加は介護保険制度の導入に関する議論に火をつけた。韓国政府が本格的に介護保険制度の導入を議論し始めた 2000 年の高齢化率は 7.2%で日本が介護保険制度の導入を議論し始めた1994年の 14.1%(2000年:17.3%)よりもはるかに低い。また、2000年韓国の国民医療費に占める老人医療費の割合は 17.5%で 1994 年の日本の44%(2000 年:50.2%)を大きく下回っている。ではなぜ韓国では日本より速い段階で介護保険制度の導入が議論されたのか。最初の原因として健康保険の慢性的な財政赤字が挙げられる。表 15 は 2000 年前後における韓国の健康保険の財政状況と高齢化率を示している。健康保険の財政は 1997 年から赤字に転換しており、赤字の幅も毎年大きくなっている。財政赤字の主な原因としては保険料収入の増加より診療に対する保険給付費がより大きく増加した

表 14　韓国における年齢別高齢者の所得源

区分	全体	65～69歳	70～74歳	75歳以上
○就業・事業・内職による所得	27.8	38.9	28	12.6
○資産所得	12.5	14.2	11.8	10.7
○公的な所得移転	92.6	83.2	98.7	99
公的年金	13.9	20.3	13.3	6.1
年金以外の社会保険給付	0.2	0.1	0.2	0.2
敬老年金	12.8	4.7	15.9	20.6
交通手当	89.7	76.7	98.3	98.5
国民基礎生活保障給付	8.6	4.9	10	12.1
参戦名誉手当	4.9	0.4	8.2	7.6
○私的な所得移転	78.6	75.6	78.7	82.5
親戚や知人による補助金	76.9	73.4	77.2	81.3
社会団体の補助金	1	0.5	1.8	0.9
その他の所得	5.4	6.4	5	4.4

資料）保健福祉部(2004)『全国老人生活実態及び福祉欲求調査』

表 15　韓国における 2000 年前後の健康保険の財政状況と高齢化率

単位：億ウォン、%、件

年度	1990	1995	1996	1997	1998	1999	2000	2001	2002
収入総額	**24,321**	**56,144**	**66,309**	**75,542**	**82,297**	**88,924**	**98,277**	**119,283**	**143,053**
保険料	18,835	36,007	41,754	48,787	52,550	63,056	72,288	88,562	109,277
国庫負担	3,639	7,553	8,723	9,954	10,760	11,656	15,527	26,250	30,139
その他	1,846	12,584	15,833	16,801	18,987	14,212	10,462	4,472	3,637
支出総額	**21,640**	**50,764**	**64,642**	**77,951**	**87,876**	**96,101**	**107,442**	**141,058**	**147,985**
保険給付費	18,026	36,277	46,814	56,341	64,200	76,656	92,856	131,956	138,237
管理運営費	1,924	3,847	5,595	6,638	6,630	5,968	6,956	6,288	5,982
その他	1,690	10,641	12,233	14,973	17,047	13,478	7,630	2,814	3,766
高齢化率	**5.1**	**5.9**	**6.1**	**6.4**	**6.6**	**6.9**	**7.2**	**7.6**	**7.9**
一人当たり年間平均受診件数	**8.23**	**10.96**	**11.52**	**12.07**	**12.37**	**13.86**	**15.40**	**21.68**	**22.26**

資料）国民健康保険公団・健康保険審査評価院『2002 健康保険統計年報』、国民健康保険公団・健康保険審査評価院『2006 健康保険統計年報』、統計庁『2007 年韓国の社会指標』、OECD *Health Data2007* より作成

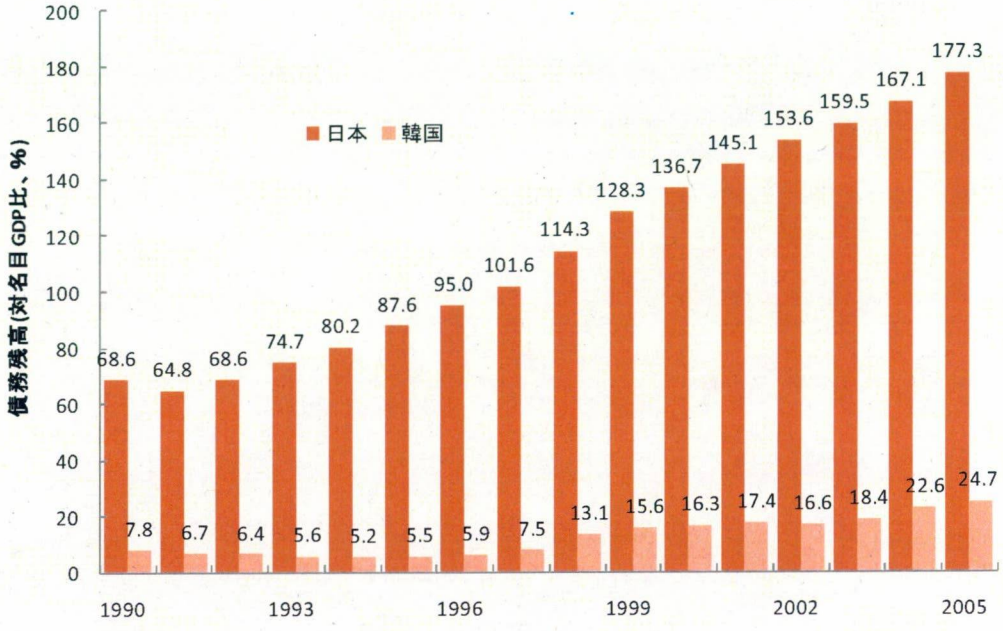
ことが挙げられる。すなわち、高齢化率の増加とともに一人当たり年間平均受診件数も継続して増加した。勿論、高齢化率以外にも一人当たり国民所得の増加や所得水準向上による健康に関する関心増加など一人当たり受診件数を増加させる要因は多数存在する。しかし、高齢化率の上昇は一人当たり平均受診件数を増加させる主な要因であり、その結果国民医療費に占める老人医療費の割合が上昇したことは否定できない事実であるだろう。

日本が 1994 年に厚生省（現　厚生労働省）内に高齢者介護対策本部を設置し介護保険制度の導入に向けて本格的に動いたように韓国も 1999 年 12 月に「老人長期療養保護政策研究団」を設置してから老人長期療養保険制度に対する準備を始めた。同団体は 2000 年に「老人長期療養保護政策企画団」に名称を変更した以降、同年 12 月に「老人長期療養保護総合対策方案」を発表し、老人長期療養サービスの概念やサービスの供給モデル、そして老人長期療養保護を実施するための人材や施設の基盤を構築するための基本的な案を提案した。それ以降「公的老人療養保障推進企画団」や「公的老人療養保障制度実行委員会」が次々と設立され制度の名称や運営方式、被保険者や給付対象、給付対象やサービスの種類、財源や管理運営機構などの具体的な内容が議論され

た。2007年4月2日には国会本会議で「老人長期療養保険法案」が可決され2008年7月1日から「老人長期療養保険制度」という名称で施行することになった。制度の概要は日本の介護保険制度をモデルとしているものの、被保険者を拡大し手続きやサービスの内容を簡素化するなど国の財政的・行政的負担を最小化しようとした。すなわち、日本の介護保険制度が65歳以上の高齢者を第1号被保険者、45～64歳までを第2号被保険者として区分したことに比べて、韓国の老人長期療養保険制度は、健康保険に加入している全国民を被保険者として指定している。一方、サービスを受ける対象者は日本のように65歳以上の高齢者と45～64歳までの老人性疾患を抱えている者に制限しており給付に対する負担を抑制する路線を採択した。財源の仕組みは両国ともに保険料と国庫負担、そして自己負担を基本にしているものの、介護サービスを利用するときの自己負担率は日本が居宅・施設サービスともに1割を基準にしていることに比べて韓国は居宅が1.5割、施設が2割で全体的に日本より高く設定している。ではなぜ韓国は日本よりサービス利用時の自己負担率を高く設定したのか。その一つの理由として韓国政府の財政運営方針が挙げられる。すなわち韓国政府は政府の財政支出を最小化しようとする路線を維持しており、それは「対名目GDP比政府支出」と「対名目GDP比債務残高」の両者の数値を見てもはっきり現れている。韓国政府の対名目GDP比政府支出は30.7%(2006年)でOECDの平均40.6%を大きく下回っており、OECD加盟国のうち最も低い水準である。また、対名目GDP比債務残高も27.7%(2006年)でOECDの平均77.1%より低く、韓国より低い国はルクセンブルク(10.8%)、オーストラリア(16.1%)、ニュージランド(27.2%)しかいない。一方、日本の対名目GDP比政府支出は36.6%で韓国より少し高いがOECDの平均よりは4%ポイント低い。しかしながら、対名目GDP比債務残高は177.3%(2005年)でOECDの平均77.1%を大きく上回っており、韓国とは大きな格差（韓国より約7.2倍高い）を見せている（図11)。韓国政府は今後高齢化が進んでもこの割合を30%水準で維持する方針であり、このような財政運営方針が日本より本人負担率を高く設定するのに影響を与えた可能性が高い[19]。

[19] 韓国韓神大学校裵埈皓教授との電話インタビュー

図 11　日本と韓国における債務残高(対名目 GDP 比、%)の動向



資料）OECD *Economic Outlook 82 database.*

但し、韓国が高齢化社会を迎えた 2000 年における対名目 GDP 比債務残高は 16.3%で日本が高齢化社会を迎えた 1970 年の 9.6%より高く、今後少子高齢化が急速に進んだ場合、政府の意思とは異なって債務残高が急速に増加する恐れがある。

サービスは 2000 年 4 月日本が在宅と施設サービスを同時に実施したように韓国も両サービスを同時に実施する予定であり、そのための施設拡充と人材養成方案を準備している。要介護者の等級は、日本が要支援 2 等級と要介護 5 等級を合わせて総 7 等級に分類していることに比べて、韓国は 3 等級に分離している。また、等級判定過程も日本のコンピュータによる判定などを省略し簡素化した。給付方式においては日本が現物給付だけを実施していることに比べて韓国は現物給付に加えて家族療養費、療養病院看病費、特例療養費に対しては現金給付を行っており、日本の制度とは多少の差異を設けている（表 16）。

表 16　日本と韓国における介護保険制度の比較

	日本	韓国
制度名	介護保険	老人長期療養保険
施行時期	2000年4月	2008年7月
管理運営	市町村	国民健康保険公団
サービスの種類	居宅 、施設	居宅 、施設
財源の調達	保険料＋国庫負担＋本人負担	保険料＋国庫負担＋本人負担
被保険者	第1号被保険者:65歳以上 第2号被保険者:40歳から65歳未満の医療保険加入者	全国民
保険料	第1号被保険者:全国平均が月4090円(2006年度) 第2号被保険者:政府管掌健康保険の介護保険料率1.13%(2008年度)	健康保険料額 X長期療養保険料率(2008年度:4.7%、2015年度には5.7%に引き上げ)
保険料の徴収	第1号保険者:年金からの天引き 第2号保険者:加入している医療保険の保険料と併せて徴収	加入している医療保険の保険料と併せて徴収
本人負担(サービスを受けるときの負担)	1割	居宅:1.5割、施設:2割
保険料免除	あり	あり(国民基礎生活保護対象者:全額免除)
費用負担割合	施設→保険料:50%、国:20%、都道府県:17.5%、市町村:12.5% 居宅→保険料:50%、国:25%、都道府県:12.5%、市町村:12.5%	国:保険料予想収入額の20% +医療給与受給権者の長期療養給付費用(国+地方自治体) 2010年推計金額を基準にした場合→保険料:71%、国:29%
受給対象者	1. 65歳以上:常に介護を必要とする状態や、家事や身支度等日常生活に支援が必要な方 2. 40歳から64歳まで:初老期痴呆、脳血管障害疾患など老化が原因とされる15種類の病気により要介護状態や、要支援状態となった方	1. 65歳以上:常に介護を必要とする状態や、家事や身支度等日常生活に支援が必要な方 2. 65歳未満:老人性疾病を抱えている者のうち長期療養1～3等級に判定された者
等級	要支援1～2、要介護1～5の7段階	3～1等級の3段階
等級の判定	主治医意見書を書く医師を決定→申請→認定調査→コンピューターによる1次判定→介護認定審査会で等級判定	申請→認定調査による1次判定→長期療養等級判定委員会で等級決定
現金給付	なし	あり(家族療養費、療養病院看病費、特例療養費)
制度実施初年度の介護サービス利用者数	149万人(全高齢者の6.8%)	全高齢者の3.1%を予想
制度導入時の高齢化率	17.3%(2,200万人)	10.3%(推計)

資料）厚生統計協会(2007)『保険と年金の動向』2007年第54巻第14号、国民健康保険公団老人長期療養保険ホームページ、http://www.longtermcare.or.kr/、国民健康保険公団老人長期療養保険担当者へのヒアリング調査により作成。

5. 結論

日本と韓国の医療保険制度は同じ社会保険方式を採択しているものの、両国の社会・政治・経済的な状況によって異なる形で定着した。両国はそれぞれ「健康保険法」と「医療保険法」という異なる名前で医療保険に関する法律を制定したものの、国民の健康維持のために保険給付を行い、国民の生活の安定と福祉の向上に寄与するという共通の目的を有している。国民皆保険制度の導入以前まで両国で見られる共通的な特徴としては適用対象者の拡大と給付範囲の拡大政策が挙げられる。しかし、国民階保険制度実施以降の両国の医療保険政策は日本が高齢者医療政策を中心としたことに比べて、韓国は制度の改革を中心として政策を展開した。日本がこのような政策に基づいて老人保健制度と介護保険制度などの高齢者を対象とする医療政策を実施した背景には急速な人口高齢化とそれに伴う高齢者医療費の増加が挙げられる。2000 年に実施された韓国の医療保険組合の統合と強制的な医薬分業の実施はその以前までほぼ同一なシステムとして考えられた日本と韓国の医療保険制度に線を引く重要な転換点の役割をした。

また、一方で、韓国が日本とは異なって「老人保健制度」を実施せず、直接日本の介護保険に当たる「老人長期療養保険制度」を縮小・導入しようとする動きがあることも両国の財政方針と政策運営方向の差を明らかに示している部分であると言えるだろう。

本研究は日本と韓国の医療保険制度と介護保険制度を比較・分析することによって韓国の医療保障制度の現実を把握し、将来韓国社会が志向すべき目標点を探すことを目的とした。超高齢社会に向かっている日本が急速な高齢化に対処するために「老人保健制度」、「介護保険」等の高齢者中心の医療体系をすでに形成していることに比べて、韓国はこれから老人療養保険制度等の高齢者のための医療システムを実施しようとしている。従って、今後急速な高齢化が予想される韓国にとって、日本が既に実施した高齢者医療政策は今後の韓国の医療政策にとって重要な参考になると考えられる。

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英語

- OECD *Economic Outlook 82 database*
- OECD *Health Data 2007*
- WHO *World Health Statistics 2008*

Postponement of Motherhood and Career Costs in Japan

Eiko Kenjoh

Abstract

Analysing the Japanese Panel Survey of Consumers 1993-2003, this paper has found strong evidence that there is a large postponement trend in motherhood from women born in 1959-63 to women born in 1964-69 and 1970-73, especially among higher-educated women. The theoretical part of the paper examined the link between delayed motherhood and indirect costs of children, i.e. women's career costs, and extends the analysis towards including occupational certificates or licenses that qualify the holder to work as a specialist in her field. Career costs for holders of such certificates are expected to be smaller. Indeed, possessing an occupational certificate increases the hazard rate, the conditional probability of having children given not to have had children by then, by nearly 30% for women with more than high school education.

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1. Introduction

In most industrialised countries, the age of the mother at first birth has reached an all-time high (see Table A1). Postponement of motherhood leads to falling fertility rates even if there were no decrease in the cohort-completed rate (Bongaarts and Feeney, 1998; Bongaarts, 1999). Thus, a better understanding of timing of motherhood contributes to the prediction of fertility trends. It is also detected that the recent postponement of motherhood is an important cause of the reduction of complete fertility rates (for example, see Kohler, Billari and Ortega, 2002) and the present trend towards increasing levels of ultimate childlessness, especially among highly educated women (Beets, 1998).

This paper analyses the postponement of motherhood in Japan. In this country, concerns on the present low fertility rates in connection with rapid ageing of the population has in recent times prompted the government to redesign public policy. In particular, since the early 1990s Japanese authorities gave increasing attention to more proactive public policies by, for example, establishing a state parental leave scheme and by reforming day-care centres (see Kenjoh, 2004; Japan's National Institute of Population and Social Security Research, 2003 for information on child-related policies). Notwithstanding the initiatives in the realm of improved policy design, the total fertility rate has continued decreasing and reached 1.26 in 2005, while the mean age of the mother at first birth has increased to 29.1 years in the same year. In fact, Japan now has one of the lowest fertility rates and the highest age of first-time motherhood in advanced countries (Table A1 and Figure 1; see the more detailed discussion in the next section).

The economic literature on postponement of motherhood distinguishes between the consumption-smoothing motive and the career-planning motive (Hotz, Klerman and Willis, 1997; Gustafsson, 2001). This paper focuses on the career-planning motive and thus links delayed motherhood to the indirect costs of children, i.e. women's career costs. The career interruption of the mother leads to two types of wage costs. First, there is the direct wage loss due to the fact that the mother is (temporarily) out of the labour force. Second, there is the human capital foregone. Indeed, staying at home for taking care of the children means that her job-related human capital stops growing or even depreciates unlike what would have happened if she had continued working. This

will obviously affect wage earnings during the rest of the career. The lower the wage at re-entry, the larger the latter cost will be. Especially in Japan, it is argued that such wage drop can be substantial. This is not surprising in view of Japanese work practices that are characterised by long-term employment at the same company and the strong connection between wage and tenure. These features of the Japanese employment system then are likely to impact upon timing of motherhood as they step up the cost of career interruption.

Holding an occupational certificate or a license (*shikaku*)[1], such as those for teachers, nurses, computer specialists, and accountants proves a person's general skill level. In other words, for women with such a certificate, a larger fraction of their skills consists of general skills rather than firm-specific aptitudes. Thus, we could expect that for these women, other things being equal, the wage decrease due to career interruption at childbirth will be smaller compared to the case for women who are not in possession of such certificate. Therefore, the career costs in having children would be smaller for the former group of women. This lower career cost then has to influence the decision making process with respect to childbearing.

The analyses in this paper will contribute to a broader policy discussion on low fertility issues. Recent studies extensively discussed the fact that the sign of the correlation between female labour force participation and fertility in the OECD countries changed from negative to positive in the 1980s. That is, the countries in which women participate more heavily in the labour market also have higher fertility since the 1990s (Brewster and Rindfuss, 2000; Ahn and Mira, 2002; Adsera, 2004; Engelhardt, Kögel, and Prskawertz, 2004). One of the key factors to explain this positive correlation is the way in which societies facilitate balancing of paid work and family responsibility.

In analysing the "true" relationship between women's employment and fertility in the OECD countries, Yamaguchi (2006) concluded that apart from legal support for childrearing through the promotion of public day-care centres, paid childcare leave, and child allowances, also greater flexibility of working and work-family balance are helpful to reduce the negative effect of female employment on fertility. Yamaguchi points to the importance to promote 1) high-quality part-time employment, 2) flexible work places, and 3) a system of re-employment in firms for job leavers for the purpose of childrearing. Yamaguchi particularly mentions the high opportunity costs of having children due to labour force withdrawals in Japan and Southern European countries.

1 For brevity, the remainder of this paper refers to occupational certificates when in fact the argument relates to both occupational certificates as well as licenses.

This paper is in line with that argument and as such examines the effect of one element of the working conditions on timing of maternity.

Section 2 analyses trends in postponement of motherhood and fertility in Japan. Special attention is devoted to the question whether postponement of motherhood has resulted in smaller completed fertility and higher rates of ultimate childlessness. Section 3 discusses economic incentives within the analysis of postponement of motherhood and delineates the potential effects of the possession of an occupational certificate. Section 4 presents the estimation results of an empirical analysis of first-birth timing among the most recent cohorts of Japanese women. It explores the association between timing of childbearing, educational levels and the possession of occupational certificates. Section 5 investigates the effect of having an occupational certificate on the timing of first birth by estimating a piecewise constant model. Section 6 concludes.

2. Trends in Fertility and Postponement of Motherhood in Japan

This section analyses the main developments on fertility and timing of motherhood in Japan. As we can see in Figure 1, the total fertility rate (TFR) was relatively stable around the replacement level of two children per woman from 1955[2] to the mid-1970s except for a sharp drop in 1966[3]. Since then, however, it decreased continuously and reached 1.26 in 2005. Kohler, Billari and Ortega (2002) see 1.3 children per woman as a critical level in fertility and typify countries with a TFR below that level as "lowest-low fertility countries". Japan is now one of these countries (Kohler, Billari and Ortega, 2004; also see Table A1).

(Figure 1 around here)

2 In the early years after World War II, the Japanese total fertility rate experienced a steep decline from more than 4 children per woman to nearly the replacement level of 2 children. Therefore, Figure 1 starts after this drastic decline.

3 In 1966, the number of births dropped sharply by 27% compared to the 1965 and 1967 levels. This was caused by the superstition on the year of the fire horse (hinoe uma). The superstition holds the belief that girls born in the year of the fire horse would be aggressive and bring harm to their future husband. This then would imply that these girls would face difficulties to get married. As a result, many couples avoided having children in that year. Contrary to the proclaimed implication of the superstition, however, the women born in that year actually did not seem to face such marital problems. The 1966 birth cohort had higher fertility rates than the surrounding birth cohorts: 1.65 at age 37, whereas the corresponding figures were 1.53 for the 1965 cohort and 1.36 for the 1967 cohort (Japan's Ministry of Health, Labour and Welfare, 2006; see also Figures 2 and 3). The women born in 1966 thus seem to have taken 'advantage' of the smaller cohort size to find a partner and start a family rather than suffer from the superstition.

Figure 1 also shows that the mean age of women at first birth in Japan has steadily increased since the mid-1970s after a period with stable values around 25-26 years. In 2005, the average age at becoming a first-time mother hit a record level of 29.1 years, which was one of the highest in the advanced countries (see Table A1; d'Addio and d'Ercole, 2005). The development of the two curves in Figure 1 depicts a clear contrast as the TFR and the age of motherhood present a strong negative correlation with a correlation coefficient of -0.941 (p-value < 0.001, own computations).

When the age of motherhood increases, TFRs fall even if there were no decrease in the number of children that women actually have in their lives (Bongaarts and Feeney, 1998; Bongaarts, 1999). Indeed, the decrease in TFRs can be decomposed into the tempo effect of postponement of motherhood and the quantum effect of the decrease in family size. Removing the tempo effects from the TFRs, the tempo-adjusted period fertility rates, or estimates of the completed cohort fertility associated with currently observed TFR levels can be calculated (Bongaarts, 1999; Bongaarts and Feeney, 1998; Lesthaege and Willems, 2002; Kohler and Philipov, 2001; Kohler, Billari and Ortega, 2002; Sobotka, 2004a, 2004b).

The decomposition of the decrease in the total fertility rate into the quantum and tempo effects has also been studied for Japan. For the periods from 1970 to 1980 and from 1985 to 1995, Fukuda (1999) shows that the relative importance of the quantum effect to the tempo effect increased from the former period (10.2% for the quantum effect vs. 89.8% for the tempo effect) to the latter period (40.3% vs. 59.7%)[4]. The main result from these studies is that postponement of maternity is responsible for some of the decrease in fertility, but that there are also substantial quantum effects. As pointed out by Kohler, Billari and Ortega (2002), it is a well-established result that there is a connection between tempo and quantum effects in the sense that later first births also result in smaller completed cohort fertility.

Has the ongoing postponement of motherhood also resulted in smaller cohort fertility rates in Japan? Figure 2 displays cumulative live birth rates, or the number of children ever born per woman by age of the mother. The figure presents these rates for women

4 Since it is still uncommon in Japan to have children outside marriage (2.0% in 2005; Ministry of Health, Labour and Welfare, Vital Statistics), a similar decomposition is often based on the timing of marriage and the number of children per married couple and suggests that the postponement of marriage is the main factor behind low fertility (see, for example, Ministry of Health and Welfare, 1998). At first glance, this suggests an optimistic view: once people marry, they have children as many as couples did have in earlier years. However, a detailed analysis by Hiroshima (2000) shows that approximately 30% of the decrease in TFR from 1970 to 2000 is to be attributed to lower marital fertility, while the rest is due to postponement of marriage.

born in 1932-85 and shows a clear postponement trend in childbearing when comparing older to younger cohorts. For example, generations born in 1954 and earlier have had 1.4 to 1.6 children by age 29, whereas the corresponding figures for the 1965 and 1975 cohorts declined to 0.94 and 0.68 children, respectively.

(Figure 2 around here)

Figure 2 also shows that the additional increase in the number of children becomes fairy small after age 34 and almost negligible after age 39. Thus the rates at 39 may be seen as a useful indicator of the completed fertility rate (CFR) for younger cohorts, which have not yet reached the end of their reproductive period. The figure indicates that generations born in 1932-54 have had around 2.0 children per woman, whereas levels declined below 2.0 for women born in 1955 and after, reaching 1.57 for the cohort born in 1965. In sum, younger generations postpone childbearing more and more and they are very likely to end up with CFRs considerably below the replacement rate of 2 children.

Figure 3 presents a similar graph on cumulative live birth rates, but only for the first child. In this figure, we can see again a delay of maternity. Note that the mean age of women at first birth in Figure 1 is based on information only for mothers, whereas Figure 3 includes information on all women in the cohort. The figure shows that nearly 80% of women born in 1953 and 1954 gave birth to their first child by age 29, while less than half of women do so in cohorts born in 1970 or later. Moreover, as in Figure 2 the increase in the birth rates is very small after age 34 and virtually negligible after the age of 39 years. We could thus interpret the rate at 39 as an approximation of the proportion of women who ultimately have given birth to at least one child. This rate decreased from 0.90 for the 1954 cohort to 0.75 in 1965, implying that the proportion of women who (ultimately) remain childless increased from 10% to 25% between these two cohorts.

(Figure 3 around here)

In sum, as in many other OECD countries postponement of motherhood is also to be observed in Japan. Although this has been an important factor in the decline of the TFR since the 1970s, the CFR was rather stable at around 2.0 in the cohorts born in the early 1930s until the early 1950s. However, for the generations born from the late 1950s onwards, the CFR is likely to fall rapidly and the frequency of ultimate childlessness is expected to increase considerably.

3. Theoretical Considerations

In the economic literature on the postponement of motherhood, the consumption-smoothing and the career-planning motives are distinguished. Hotz, Klerman and Willis (1997), Gustafsson (2001) and Gustafsson and Kenjoh (2008) present literature reviews on this research field. The theoretical models of Happel, Hill and Low (1984), Cigno and Ermisch (1990), Cigno (1991, chap. 8) and Walker (1995) are intensively discussed in Gustafsson (2001) and therefore will only be briefly reviewed in this section.

The consumption-smoothing motive is intensively discussed by Happel, Hill and Low (1984). In their model that is based on perfectly imperfect capital markets, which means that there is no opportunity to borrow against future incomes, the earnings profile of the male stands at the centre because he is the main breadwinner. The more he earns, the more likely the couple will be able to afford having a child without having to forsake other consumption plans. This motive therefore concentrates on the inter-temporal income effect of having a child. Note that in the model of Happel, Hill and Low (1984), the woman does not invest in human capital at all and has a constant earnings profile.

The career-planning motive, on the other hand, explicitly drops the latter assumption of the woman not investing in her human capital. More in particular, this motive concentrates on the potential detrimental effects of having children on the mother's professional career. These costs have received most attention in economic research (Gustafsson, 2001). Basically, the career costs comprise two main parts. First, there are the direct forgone wages whilst being out of the labour force. Second, one has to take account of the loss or depreciation of investments in human capital and thus the lower returns to these investments that, of course, cover a much longer time span, namely the rest of the career. It is assumed that capital markets are perfectly allowing for borrowing and saving across periods. The husband's earnings are left out of the analysis, which reflects the assumption that his labour market career is not affected by the decision on and timing of birth. The above career costs thus affect the optimal timing of motherhood and they depend on the following five determinants:

1. the amount of pre-maternity human capital;
2. the rate of depreciation of human capital due to non-use;

3. the rate of return to human capital investments;

4. the profile of human capital investments;

5. the length of time spent out of the labour force.

Increases in these factors tend to favour postponement of birth (Gustafsson, 2001). Given the woman's rising earnings profile, net wage will be larger later in life so that the direct wage loss during the withdrawal from the labour force will be the larger the older the new mother is. On the other hand, the loss associated with the forgone human capital will be smaller for older mothers because the number of remaining length of the career is smaller. Therefore, from the point of view of female career planning, postponement of first motherhood entails two opposing effects: a higher lost net wage against a smaller capital loss. Note that if the investment profile is non-linear, for example quadratic as suggested by the vast literature on estimated earnings functions, the capital argument for postponing having a child would dominate (Gustafsson, 2001).

In terms of the aforementioned five determinants, possession of an occupational certificate affects job skill depreciation as will be explained below[5]. According to human capital theory (Becker, 1964), the woman's wage increases with tenure due to skill accumulation as a result of investment in human capital. Part of the skills that one acquires is *firm specific*, namely skills that contribute to the productivity increase only for the company where one receives the training. The other part of skills is essentially *general* and thus can also be used in other companies. When the worker changes her job involuntarily or due to family reasons, she is likely to face a lower wage offer because some of her previously acquired skills will not be useful for the new company. Other things equal, her wage loss at re-entrance to the labour market is more sizeable if a larger part of her skills is of the firm-specific type and a smaller part of them is of the general type.

Occupational certificates or licenses, such as those for teachers, nurses, computer specialists, and accountants have a clear in this respect. In fact, they demonstrate one's general skill levels and also for women with such a certificate they indicate that a larger fraction of their skills consists of general skills rather than firm-specific aptitudes. For

5 The theoretical discussion on timing of motherhood incorporates depreciation of human capital, but the effect of skill depreciation on fertility has hardly been examined empirically. For example, in the Happel, Hill and Low (1984) model, depreciation of human capital plays an important role. However, the empirical part of their analysis does not examine this effect due to the lack of a directly observable measure.

these women, the wage decrease due to career interruption at childbirth should be smaller when compared with the wage drop for women that do not hold an occupational certificate. Therefore, the career costs in having children should be smaller for those that possess an occupational certificate and this would also allow the women to have children earlier in their lives in line with the above theoretical discussion on the timing of motherhood.

Moreover, the smaller wage decrease at re-entrance implies a higher re-employment wage, which most likely would also reduce the period of full-time motherhood and increase the employment rate of mothers. Both the theoretical as well as the empirical literature indeed show that women with higher wage re-enter the labour market more quickly after having children (see for example, Leibowitz, Klerman and Waite, 1992). Therefore, also through this effect, women could be expected to diminish the career costs of motherhood by holding occupational certificates[6].

The effect of the occupational certificate may be also more relevant in Japan than in many other countries. In fact, Japanese work practices favour workers with long-time employment in one company, more in particular those who started working there after graduation and who since then have stayed with that company. The wage increase as a function of tenure therefore is large in Japan when compared to various other countries[7]. As a result, the disadvantage of changing jobs or having an interrupted career is large.

Recently, such large wage penalty has been acknowledged as one of the reasons for present low fertility in Japan. For example, the Japan's Cabinet office (2003) takes up this argument, and calculates the lifetime earnings loss of job interruption for a typical university-educated woman. Assuming six years of career interruption, her lifetime earnings loss is estimated at as much as 29.7% of her total lifetime earnings that would

6 The higher employment rate for mothers that hold an occupational certificate are indeed confirmed for my dataset. I estimated mothers' employment choice between full-time employment part-time employment, and not working. The estimation results are given Table A2 and the coefficient estimates for the possession of an occupational certificate clearly indicate that women with such certificate are more likely to be both in full-time and part-time employment compared to being not in employment than women without such certificate.

7 The wage of Japanese workers with longer tenure relative to that of workers with shorter tenure is much larger than in various European countries (UK, the former West Germany, France, Italy, Sweden) (The Japan Institute of Labour, 2003: Tables 6.4 and 6.5). For instance, in the Japanese manufacturing industry, male production workers with more than 20 years of tenure earn 1.72 times the wage of those with 0-2 years of tenure (1.39 for women). The corresponding figures for managerial workers are 1.94 for men and 1.62 for women. These figures are the largest among the six aforementioned countries. On the other hand, a similar comparison based on age shows that Japanese older workers do not necessarily earn a much higher salary when compared to younger workers as is also the case in the other countries. These comparisons suggest the relative importance of tenure rather than age in the wage profile in Japan.

prevail if she would have continued working. Of this amount, 32.3% is the direct wage loss related to her absence from the labour market, and the rest is the capital forgone[8]. Having an occupational certificate would then (substantially) reduce such severe career costs and therefore should be of strong relevance in Japan.

4. Postponement of Motherhood among Recent Cohorts

The rest of this paper analyses the timing of motherhood using the Japanese Panel Survey of Consumers (JPSC) 1993-2003 (see below). The focus is on the effect of possessing an occupational certificate. I also examine the association between women's educational attainment and the timing of motherhood. The theoretical discussion in Section 3 suggested that women's educational levels have an influence on the timing of motherhood under the career-planning motive. In studies of other industrialised countries, higher-educated women are found to have children later than lower-educated women (see, for example, Gustafsson, Kenjoh and Wetzels, 2002, the papers in Gustafsson and Kalwij, 2006, and the literature review by Gustafsson and Kenjoh, 2008).

However, studying the cohorts of Japanese women born in 1929-38, Morgan, Rindfuss and Parnell (1984) do not detect a statistically significant association between women's education and the timing of first birth[9]. However, this was in sharp contrast to their findings for the same cohort of women in the United States. The authors conjecture that the strong sex division of labour and the scarcity of professional career paths for women in Japan cause this result.

However, in the meantime the Japanese legal framework for promoting women's careers has advanced considerably (cf. the Equal Opportunity Employment Law of 1985). Educational attainment of Japanese women has also risen. Particularly since 1990, the advancement rate into university education has grown rapidly and even doubled from 15.2% in 1990 to 31.5% in 2000 (cf. 6.5% in 1970 and 12.3% in 1980; Japan's Ministry of Education, Culture, Sport, Science and Technology, *School Basic*

8 In this simulation, the woman is assumed to enter employment at age 22 and quit her job at age 28 when her first child is born. She is also assumed to re-enter the labour market at age 34 when the first child goes to primary school and to work until age 60. In the case that the woman works part-time and limits her annual income to the income threshold of one million yen as many Japanese women currently do (see for example, Higuchi, 1997; Kenjoh, 2004, chap. 2), she faces losses of even 80% of her lifetime income.

9 The data sets are the 1974 National Fertility Survey for Japan and the 1973 National Survey of Family Growth for the United States.

Survey). On the other hand, international comparisons show that the labour force participation rate among Japanese mothers with young children remains fairly low, even among highly educated women (OECD, 2001, chap. 4; Kenjoh, 2005). Thus, the career opportunity path of Japanese women has advanced, but it seems still not well developed compared to the situation in many Western-European and Anglo-Saxon countries.

In this vein, a more recent study by Ermisch and Ogawa (1994), who analysed women born in 1941-68 using the 1990 National Survey on Family Planning conducted by the Mainichi Newspapers of Japan[10], reported that the postponement effect of education on women's timing of first birth was stronger for younger generations than for older cohorts. In the following, I analyse women born in 1959-73, using more recent information that, in fact, extends to 2003. As such, I can shed more light on the basic question whether longer education and possession of occupational certificates affect postponement of motherhood in more recent time periods.

In order to describe timing of the first birth for all women including those who have not yet become a mother, the section presents estimates of the Kaplan-Meier survivor function. The Kaplan-Meier product-limit estimator is a strictly empirical, nonparametric approach to survival and hazard function estimation (see Kiefer, 1988; Greene, 2003). In the rest of this section I first introduce the data set and the definition of the key variables of the analyses, namely education and occupational certificates. I then present results on the association between the level of education and postponement of motherhood, after which attention will be devoted to the question whether or not occupational certificates influence timing of first birth.

4.1 The Data

The data used here are the Japanese Panel Survey of Consumers (JPSC) 1993-2003, conducted by the Japan's Institute for Research on Household Economics. The JPSC started with 1500 women nationwide aged 24 to 34 in 1993 (born in 1959-69; sample A). Additionally, 500 women (born in 1970-73, sample B) joined the survey at age 24 to 27 in 1997 and 836 women (born in 1974-79, sample C) at age 24 to 29 in 2003. Among these samples, I study samples A and B in this paper. In the analyses, the sample of women is divided into three birth cohorts, namely those born in 1959-63, in

10 This is a cross-section data set with retrospective information on the fertility history of 2,991 women aged 22-49 in 1990.