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The Fertility Rate and the Economic Crisis

Discussing a Theoretical Attempt to Predict Demographic Development in Japan

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ドイツ日本研究所
Deutsches Institut für Japanstudien Tokyo (DIJ)
German Institute for Japanese Studies Tokyo
Jochi Kioizaka Bldg. 2F
7-1 Kioicho, Chiyoda-ku, Tokyo 102-0094
Japan
Tel.: +81-3-3222-5077
Fax: +81-3-3222-5420
www.dijtokyo.org

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1. Introduction

The economic crisis, triggered in the US in the fall of 2008, quickly turned into a global affair that took over the top spot on the political agenda of all industrialized countries. Even though the first shock wave has ebbed away, mass media, politicians and academia have continued analyzing and discussing consequences for banks and financial systems, industries, labor market and employees. With these topics drawing a huge share of public attention, naturally others have remained unattended to, irrespective of their significance for society. The question of how Japan's low total fertility rate (TFR[1] of 1.37 as of 2008; Naikakufu 2009) will be affected, for example, is rarely addressed. This issue, however, is no doubt important as it deals with the impact of one significant crisis onto another.

Due to its rapidly ageing and shrinking society, Japan is already confronted with a wide array of challenges, such as a strained pension and health care system, a lack of labor force in long-term care, and the depopulation of rural areas. The question of what the 2008 economic crisis has done to Japan's fertility rate therefore is of importance, as a further decline in the fertility rate would not only aggravate said problems, but may also bring about new ones in the longer run such as diminishing innovative potential and a decline in consumption.

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[1] The TFR "is the number of children that would be born to each woman if she were to live to the end of her childbearing years and if the likelihood of her giving birth to children at each age was the currently prevailing age-specific fertility rates." (www.oecd.org/dataoecd/37/59/40192107.pdf; accessed March 2009)

To predict the impact of the economic crisis onto Japan's fertility rate development, one needs adequate tools. Yet research until now has mostly been concerned with the causes that led to the fertility rate's significant decline since the mid-1970s, such as late and less marriages, rising opportunity costs for women, and rising educational costs for children (Yamagami 1999, Goodman 2002, Shigeno and Matsuura 2003, Nagase 2005, Ogawa et al. 2006, Date and Shimizutani 2007, Rosenbluth 2007, Naohiro 2008).

However, a different approach can be found in the so-called "Low Fertility Trap Hypothesis" (LFTH), an empirically testable tool for the prediction of fertility development in low fertility countries in general, developed by demographers Lutz, Skirbekk, and Testa (2006). It is based on McDonald's (2005) idea that fertility can decline to a degree at which it falls into a "trap" from which it cannot escape, meaning that once the TFR has fallen below said crucial point, a number of self-reinforcing mechanisms are possibly strengthened to a degree that fertility will not be able to leave the trap again. Lutz et al. (2006) concentrate on the endogenous workings of three such mechanisms (entitled LFT-1, 2, and 3).[2] Very simply put, they propose that LFT-1, the "demographic mechanism", constantly reduces the number of potential mothers born each year. LFT-2, the "sociological mechanism", slowly diminishes the number of desired children, and LFT-3, the "economic mechanism" suggests that a continuously low ratio of relative income makes young people refrain from having (more) children.

In the following, we first apply this "Low Fertility Trap Hypothesis" to the case of Japan. We conduct this step by step for each of the three mechanisms. Through the application, we find the explanatory power of the hypothesis however too limited, thus suggesting the need to complement the LFTH by additional elements. In the second part of this paper, we therefore put forward a fourth mechanism, education, which we believe explains more precisely and to a greater extend Japan's fertility development. Based on this, we attempt to show how Japan's

[2] Policy measures against low fertility are considered exogenous factors and are therefore specifically left out of this model.

fertility will develop under the influence of the current economic crisis and conclude with a long term perspective also based on the LFTH.

2. The LFTH and the Case of Japan

2.1 Demographic Mechanism

The first mechanism of the Low Fertility Trap Hypothesis (LFT-1) works on the macro-level of population dynamics and can be understood by looking at the age structure of a society. As Skirbekk[3] (2008: 10) points out, smaller cohort sizes entail less potential for the absolute number of births. Or, in other words, fewer girls born mean fewer prospective mothers for the future. In Japan, this demographic mechanism has obviously been reinforcing itself in a negative direction since the mid-1970s. While in 1973, 1,014,466 girls were born, the year 2005 only welcomed 517,498 girls (NIPSSR 2007).[4] On April 1, 2009, children (0-14 years) made up only 13.4percent (10.5 million) of the entire population, the lowest share ever recorded (Sōmushō 2009).

2.2 Ideal Family Size

LFT-2, the second mechanism, is based on the socialization process shaping ideal family size. It assumes that younger generations form their preferred family size during childhood and adolescence by what they find in their own family and the society around them. If fertility falls and the number of siblings decline, then the ideal family size will follow suit, albeit with a time-lag. As a result, the LFTH

[3] We would like to thank Dr. Skirbekk for the permission to cite his conference paper (2008) in which he submitted his analysis regarding the question if the low fertility trap mechanisms could be at work in Japan. His conclusions are affirmative for LFT-1 and 3, while he sees evidence that LFT-2 may not yet be active, but could be so soon. As became apparent during the conference "Imploding Population – Global and Local Challenges of Demographic Change" (Tokyo, June 2-4, 2009, German Institute for Japanese Studies Tokyo), the LFTH is well known among Japanese demographers.

[4] Mortality and migration, which also affect age structure, are considered to be exogenous to these dynamics (Lutz et al. 2006: 174-175).

argues, this mechanism spirals downward with declining fertility lowering ideal family size, which in turn reduces fertility again (Lutz et al. 2006: 177-178).

Skirbekk (2008) supports his case by following the lines of Rindfuss et al. (2004) who apply the concept of social innovators to understand the pressures on the traditional family model and the "[…] increasing legitimacy of decisions based on self – as opposed to collective – interests" (2004: 840). They assume that "[c]hanges in attitudes likely create a feedback mechanism, influencing behavior; and changes in behavior likely create a feedback mechanism influencing attitudes" (Rindfuss et al. 2004: 855). Accordingly, Skirbekk (2008: 12) expects the ideal number of children to decline in response to lower fertility and regards it as unlikely that there is "something that will keep them [fertility norms] from falling". Referring to the development in German-speaking countries, Skirbekk suggests that in the future, ideal family size in Japan may also fall. He quotes a survey conducted by the EU Commission (Testa 2006: 33), which showed for 2001 that the ideal family size among women in Germany and Austria had declined below two (1.66 and 1.89 respectively). Although the same study also shows that by 2006, Germany's figure had rebounded to 2.17, Skirbekk nevertheless assumes that in Japan a generational time-lag has been postponing a similar decline, but that it will most probably come.

Our critique of Skirbekk's assumption of the decline of the ideal family size below replacement levels is twofold. First we find Skirbekk's model or understanding of the socialization process too limited. Furthermore, we believe to have sufficient data providing evidence that ideal family size in Japan will not fall below two for the foreseeable future. We are therefore hesitant to assume the same explanatory power for LFT-2 as do Lutz et al. (2006).

First of all, the LFTH argues, based on the study by Testa and Grilli (2006), that "the social learning process between young and old may be the key mechanism" in the formation of individual ideal family size (Testa and Grilli 2006). This underlying presumption does not connect well with the conclusion that smaller actual family size results in smaller ideal family size later. First, socialization is a

dynamic, bidirectional and complex process that not only leads to conformity of the young to learned norms, but may also produce the opposite (Kuczynski and Parkin 2007: 259). For example, the desired number of children of young Japanese adults who grew up as an only child was not one, but almost two[5] in 2005 (NIPSSR 2006a: 13). This obviously contradicts the assumption of LFT-2. Second, as research on siblings has shown results of socialization and individual development differ considerably within the same family, stressing the unpredictability of socialization processes (Dunn 2007: 320).

The LFTH assumes the most significant agent of socialization to be parents and peers. However, particularly in Japan, the role of the media as agent of socialization should not be underestimated (Hurrelmann 2001: 96-97; Hunziker 1988). Furthermore, when the *Asahi Shinbun* reported on its front page (June 3, 2009) that the total fertility rate had risen for the third straight year, it was suggested that a number of female celebrities who had children in 2008 may have functioned as social innovators, influencing many couples to have (more) children.[6]

Our second argument against Skirbekk's assumption that Japan's ideal family size will fall below two is best explained by looking first at the *status quo.* In 2005, 87.4 percent of all unmarried Japanese women said that their ideal number of children was two or more, a mere 7.3 percent wanted only one child, the lowest figure since 1987 (NIPSSR 2006a: 12). The ideal family size for married couples among all age groups in 2005 was 2.48, down 0.13 from 2.61 in 1977 (NIPSSR 2006b: 6). In other words, ideal family size is still considerably higher than two.

Why do we assume that the ideal number of children will stay above two? First, there is a difference in quality between a decline from three to two children and from two to one, simply because the latter produces families with an only child

[5] The precise number is 1.99 for men and 1.98 for women (NIPSSR 2006b: 13).

[6] See Gabler (1998) as well as Turner, Bonner and Marshall (2000). Particularly for the increasing significance of celebrities in Japan, see also Holthus (2009).

while the former one still has siblings. A majority of Japanese couples associate a childhood without siblings to be not preferable (Naikakufu 2005). Even with a TFR of 1.26 in 2005, 87.6 percent of those couples that *did* have children had more than one with marital fertility at 2.09 (NIPSSR 2006a: 4). Furthermore, 95 percent of those who had only one child wanted more, but could not realize their wish for a variety of reasons, such as one partner becoming infertile (MHLW 2004).

A survey conducted by Benesse Research Group (2007: 43) adds the decisive factor that raises the barrier for a decline past two: They find that the wish to have at least *one child of each sex* is very strong. 72.6 percent of all couples expecting their first child want a family with a girl and a boy, while 19.8 percent want either one boy and two girls or vice versa.[7]

In summary, we believe that LFT-2 does not work well in the case of Japan. A closer look at socialization processes provides us with no clear answer as to the direction into which ideal family size will move. In addition, there seems to be a rather high barrier that keeps ideal family size from falling below two. We therefore assume that the explanatory power of LFT-2 in the case of Japan does not help us in predicting future fertility development.

2.3. Easterlin's "ratio of relative income" hypothesis revisited

Lutz et al. (2006) base their argument regarding the third LFTH-mechanism on a hypothesis by economist Richard A. Easterlin (1980).[8] Herein Easterlin assumes that potential earning power (economic outlook) and material aspirations are crucial factors for young couples in regards to their decision on family size. „The proportion between the two is what determines judgments on the ease or difficulty of forming a household" (1980: 40). It is less *absolute* income that affects fertility decisions, but the ratio of expected income to the individually aspired life-style.

[7] This ideal can already be found in the Edo-Period (1603 – 1868; Skinner 2004: 115).
[8] See also Easterlin (1976) for his "relative deprivation theory".

Again, socialization is an important element. Easterlin (1980: 40-41) states that „economic aspirations are unintentionally learned, or 'internalized', in one's parents' home. And this environment is by and large shaped by the economic circumstances, or income, of one's parents." In order to test his argument empirically, he proposes a "ratio of relative income" (RRI) which is the quotient of dividing the "recent income experience of young man" by "past income of young man's father" (1980: 42-43). In his analysis of the U.S. from the 1940s to the 1970s, Easterlin finds the TFR and the relative income ratio to move in parallel. This leads him to conclude that "the evidence supports the relative income hypothesis, both for the baby boom and for the baby bust" (Easterlin 1980: 51).

Lutz et al. (2006: 182-183) applied Easterlin's hypothesis to age-specific income data from Japan and other countries for the period from 1974 to 1995. Basically, their method of computing the RRI follows Easterlin (1980) as "the income of economically active men aged 25-34, which refers to the fathering children, [is] divided by the income of economically active men aged 45-54, which is supposed to capture the income of the parental generation" (Lutz et al. 2006: 182) [9] An RRI of 1.0 indicates that material aspirations and economic outlook are equal, any value below, however, indicates that material aspirations are higher than the economic outlook.

For Japan, Lutz et al. (2006) find an RRI between 0.6 and 0.8, indicating that economic outlook of young Japanese was consistently smaller than their material aspirations. As Easterlin's theory suggests, fertility fell during most of the years in that period and Lutz et al. (2006: 182) conclude that "[…] there are no convincing

[9] The "young men" in Easterlin's study consisted of the age bracket 15-24, Lutz et al. (2006: 182) use the 25-34 age cohorts. The "father"-cohorts, however, remain at 45 - 54. Consequently, the calculation of Lutz et al. assumes fathers to be between eleven and 29 years old, while in real life Japanese men in 2008 were already 30.2 years old on average at the time of marriage (MHLW 2009b: 15). In addition, while Easterlin divided the young men's early income by that of their fathers from five years ago to catch the household income at the time of the young men's adolescence, Lutz et al. (2006: 182) do not include this time lag into their calculation.

reasons to dismiss the argument put forward by Easterlin that indeed this [relative income ratio] should be a factor in determining future fertility declines."

We, however, caution against this conclusion. By looking at the RRI development in more detail we find far less correlation than suggested by Lutz et al. Between 1975 and 1980, while fertility fell, the ratio of relative income actually grew. Over the next years, it was the other way around: Fertility grew, and the RRI declined. From 1985 to 1990, both declined slightly, but while over the next five years the RRI slowly grew, the TFR moved first down, then up, then down again. In other words, both indicators declined over the complete period of 20 years, but their movement did not develop in parallel. So if looking broadly only at the first and last year of this 20-year interval, one would indeed confirm Easterlin's theory. We however, suggest looking at the development in more detail, thereby concluding that this actually contradicts Easterlin's theory for the case of Japan.

One of the reasons why we believe LFT-3 does not work the way suggested by Lutz et al. (2006) seems to be that Easterlin's ratio (and LFT-3) is a purely male model. Yet in Japan, when looking specifically at the population of married couples, the number of dual income families has been on the increase ever since 1980. They have superseded family forms in which the father is the single earner in the family since 1996 (Naikakufu 2008). Taking complete household income into account, however, is vital to capture the material and economic well-being of a family.

A second factor that adds to the imprecision of the RRI can be found in the complexity of socialization processes and the resulting material aspirations. As Easterlin (1980: 44) admitted, his quantitative proxy was born out of a lack of "good data". As a result, he reduced socialization of acquiring material aspirations of a child to one annual income of its father, risking oversimplification of the case.

Skirbekk (2008: 26) in his application of the LFTH to the case of Japan already anticipates criticism about the validity of the RRI as an appropriate measure for

"[..] the relationship between the two factors aspirations and expected income". He does so by adding "broader evidence and data".

One is that the economic well-being of the young will continue to decline, as today's governments are clearly putting the greatest burden of social security reform on the shoulder of the younger generations (Skirbekk 2008: 29). Regarding material aspirations, however, he claims them to "[..] have been on the rise for quite some time and are unlikely to decline soon" (Skirbekk 2008: 27). Responsible for that is on the one hand the advertising industry, and on the other his assumption of children growing up in smaller families, and thus having to share the wealth of their parents with fewer siblings.

We agree with Skirbekk's (2008) assumption of declining economic wellbeing, yet are cautious regarding the assumption that material aspirations will remain high or even continue to grow in Japan. The end of the bubble economy[10] in 1990 was followed by the Asian financial crisis (1997), the end of the New Economy[11] (1999), and the worldwide economic crisis in 2008. Each time, especially young people graduating from school and university were confronted with a heightened fear and risk of falling out of the primary labor market. For almost two decades now, Japanese children and adolescents have been growing up in a society in which the insecurity of labor markets and future economic outlooks have been omnipresent topics. This is especially true since these developments are in stark contrast to what Japanese society had experienced since the beginning of the high economic growth period in 1955.

Since the late 1990s, a constant wave of media reports on the decline of the "middle class" and growing social inequalities (*kakusa shakai*) has also penetrated public opinion. Market liberalization policies under the government of Koizumi (2001–2006) contributed to this picture. Assuming that the development of material aspirations of young Japanese has not been affected to some degree seems unrealistic. For example, according to a survey conducted by the City of

[10] Cf. Cargill et al. (1997).
[11] Cf. Yamada 2007.

Tokyo (CoT 2003), 74.4 percent of all 8th graders believe that once grown up, they would be worse off than at present. We do not doubt that economic outlook and material aspirations have an impact on family formation and the decision whether and when to have a child. However, the case of Japan offers evidence which obviously reduces the aptitude of the RRI and LFT-3 as significant measures for fertility development.

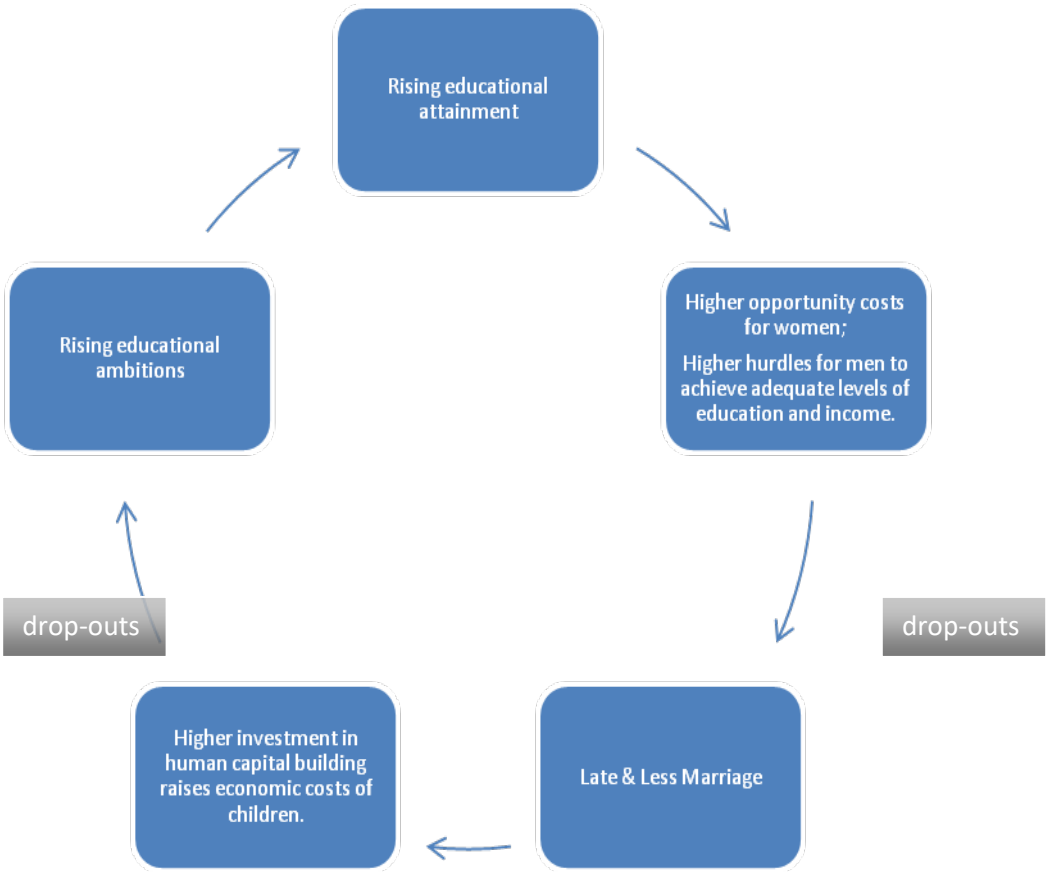
In summary, our above application of the LFTH to Japan indicates that the hypothesis is too limited to explain or predict Japan's fertility development exclusively with the three given mechanisms. We see the need to stress that the hypothesis does not integrate a number of factors that social science research on Japanese fertility development has understood to be of importance, among them the increase in education levels and labor force participation of women, aspects of family contra work culture, and the rising economic costs of children. We therefore suggest that in order to strengthen the explanatory power of the LFTH, additional factors should be included into the equation. We suggest 'education' as the core element of a fourth self-reinforcing mechanism of social change. It may not be the only additional mechanism and it does not integrate all relevant factors for fertility development, but it surely has been continuously contributing to the decline of fertility in Japan.

2.4 Education as core element of "LFT-4"

To use the terminology introduced by Lutz et al. (2006), we refer to this additional, fourth mechanism as "LFT-4."[12] It maps the connection and sequence of significant education-related social processes and helps to understand how they reinforce each other in their impact on fertility. Figure 1 depicts the basic functioning of LFT-4 and the elements it consists of.

[12] Skirbekk (2008) in his application of the LFTH to Japan also briefly considers education, limiting it to its role as postponement factor on family formation and as status attainment on the marriage market (2008: 32-36).

Figure 1: The Spiral of LFT-4



We begin by looking at rising educational attainment of young people. This development is driven by a number of factors, among them the rising social value of education itself and the desire to achieve personal employment ideals. Looking at data from Japan regarding education levels, we find a constant rise over the last sixty years, reaching levels unmatched in other industrialized countries. In 1950, 42.5 percent of all school children continued on to high school after the nine year period of compulsory education. By 1980, the percentage had risen to 94.2 percent, and by 2007 to 96.4 percent. The share of students who go on to pursue higher education therefore has also increased considerably in the last decades. From 30.3 percent in 1950, the percentage rose almost steadily to 51.2 percent in 2007. In other words, about half the members of a cohort go on to study at two- or

four-year-universities or, to a smaller part, at other institutions of tertiary education (MEXT 2008a).

Within the overall increase in educational attainment, the advancement of women is remarkable. This development, however, does not only show in the general share of girls advancing to tertiary education. From 1955 until the mid-1980s, the percentage of female high school graduates who continued on to universities each year was only about 5 percent lower than that of boys, and since the end of the 1980s, the share has been almost equal.[13] In addition, starting in the mid-1990s, the number of female students at two-year universities declined by more than half, while more and more women chose to attend four-year universities (MEXT 2004; MEXT 2006b).

For women, higher educational attainment first of all has meant more alternatives of life-courses from which to choose from. This increase in opportunities has reduced a life as full-time housewife and mother to one among several possibilities. While in Japan, female school and university graduates used to be employed in positions that offered no chance of promotion and mostly required only basic qualifications (*ippan shoku*), higher educational achievement has increased the number of women who have entered companies on career track positions.

Neither work culture nor child care infrastructure, however, have been adjusted to this change. Japanese workplace processes and norms are at odds with the responsibilities and duties that come with a child, and employers, and in many cases co-workers as well, still prove to be mostly adverse to full-time working mothers (Roberts 2005). This environment makes it difficult if not impossible for many women to remain in gainful employment after childbirth, which is

[13] In 2007, 54.3 percent of all female and 51.4 percent of male high school graduates advanced to tertiary education (MEXT 2008b: 25).

especially true for those in career-track positions, which entail long working hours.[14]

The impact of work culture could be alleviated by better institutional child care infrastructure, which is still far from adequate. Although the concept of "work-life-balance" was imported into the Japanese debate in 2007, it has not yet translated into substantial measures that would supply more child care opportunities. The option to return to the career path after a few years of child care leave is almost non-existent. Those mothers who return to gainful employment usually do so as part-timers or in full-time positions that offer less salary and little or no chances of promotion. In other words, the higher the level of educational attainment, the more women have to choose between career and family formation. With opportunity costs of family formation rising, the number of women who remain unmarried and childless increases (Harada 2005: 57).

Another form of opportunity costs for women caused by education affects the marriage market and consequently Japanese men as well. Women clearly prefer socio-economic homogamy or marry upwards (Shirahase 2005). With their own educational and income levels rising, their expectations for a spouse also grow. For men that clearly raises the hurdle to achieve adequate levels of education and income. The 2009 "White Paper on a Society with Lower Fertility" (Naikakufu 2009: 13) explicitly mentions the gap between economic expectations of women and men's ability to "provide" as a reason for the decreasing number of marriages. The "White Book on the Life of the People" (Naikakufu 2005) shows that except for men with less than ¥ 2 million annual income, salary is positively correlated with marriage. The lower the income, the smaller is the share of men who are married.

[14] The practice of sending employees to distant company branches (*tanshin funin*) is another element of Japanese work culture that makes it very difficult for mothers to pursue a career. In male-breadwinner households, these transfers have forced many families to live separate for years, with mostly the mother and children staying and the father visiting on an irregular basis (Weathers 2005: 71).

Considering the close correlation between education and income level, the following figures support the argument: In surveys conducted 1992, 1997, and 2002 by the National Institute for Population Research, 88.7 percent, 90.9 percent and 91.1 percent of all unmarried women respectively answered that "economic strength" (*keizai ryoku*) is a criterion they apply when looking for a spouse, about 33 percent said it is a very important one (NIPSSR 2003: 15). It is paramount for men to fulfill these expectations. The fact that fewer of them are able to do so, clearly contributes to less and later marriage. That again is important since marriage is closely related to childbirth. Only 2 percent of all Japanese children are born out of wedlock.[15] Those couples who do marry generally do so because they wish to form a family with children, or are already expecting one.

A further education-related factor becomes relevant here as well. Parents consider "good" education to be an essential part of raising their children. This investment in the human capital of their children may not necessarily manifest itself in the pursuit of elite education, but can be observed in the attempt not to fall below the rising standards of educational levels (Hirao 2007) and in the process of socialization by which children learn about the value of education (Brinton 1993). A first evaluation of results from the "Japanese Life Course Panel Survey" conducted by the Institute of Social Science of Tokyo University in 2007 and 2008 confirms this argument, showing that parental education has a substantial correlation with the educational attainment of their children (Ishida 2009: 4).

However, education comes at a price. While public schools hardly put any financial burden on parents, private schools and universities, which are regarded to provide better perspectives for their students, are generally costly (Hirao 2007: 180).[16] In addition, many children, especially in urban areas, attend *juku*, a form of supplemental education institution that is not properly described by the English

[15] See: www.oecd.org/dataoecd/38/6/40278615.pdf (accessed May 2009).

[16] According to the Ministry of Education, 29.7percent of all high school students attended a private school in 2007, and 73.4percent of all university students studied at a private university. Enrollment in private elementary (1percent) and middle schools (6.9percent), however, is comparatively low (MEXT 2006a).

term "cram school". *Juku* generally teach the same curriculum as main schools or offer classes to prepare for entrance exams into the next school level or university. Benesse (2006) conducted a survey according to which 36.5 percent of all elementary school children (age 6-11) and 42.6 percent of all junior high school students (age 12-14) attend *juku*. Among high school students, the share is smaller: Only 25.3 percent study at these private institutions, which is mostly because only about half of all high school students intend to proceed to tertiary education after graduating. For the other half, there is no need to learn outside of high school. Looking at *juku* enrollment since 1994, the first time Benesse conducted this kind of survey, there is little change among elementary and junior high school pupils, but an increase from 12.7 percent to 25.3 percent among high school students (Benesse 2006).[17]

Hirao (2007: 187) shows that since the late 1960s, parents have spent an increasing amount of money on education outside the formal school system. To cover educational costs for their children, many mothers take on part-time jobs and complement family income, "shouldering significant roles as providers" (Hirao 2007: 174). In 2005, 65.9 percent of surveyed Japanese parents responded that these costs still seem prohibitively high when they consider having another child (NIPSSR 2006a: 6), proving that education contributes to the gap between the actual and the desired number of children, and thus suppresses fertility.[18]

Children raised with the overall awareness of the importance of education, themselves also contribute to rising educational ambitions. They do not necessarily do so out of their socialization experience, but because they consider it crucial in order to prevail in the competition for "good" jobs on the labor market. Here the spiral comes full circle and enters the stage of rising educational attainment again (see Figure 1 above).

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[17] As Dierkes (2008) has shown, some *juku* are also regarded by parents as day care institutions for their children. These institutions usually offer classes at lower prices and are not really meant to provide their students with the knowledge to climb the educational ladder.

[18] The decline in the absolute number of children has also led to the closure of schools in rural areas, increasing the costs for commuting to school there (Miyamoto 2009).

Two important additions need to be made to complete the explanation of LFT-4. The first one is that those in the spiral can drop out of it, the second that only few low income families are part of this educational mechanism. The "drop outs" further suppress fertility, low income families on the other hand raise fertility. This is consistent with the logic underlying LFT-4.

As figure 1 shows, there are basically two points at which participants leave the mechanism. The first one can be located right before "late and less marriage". Young women who consider the opportunity costs of children as too high might remain childless and drop out of the spiral, just as men do who are unable to offer a sufficient economic basis for family formation. Better educated women may also be unable to find a partner, due to a reduced marriage market.

The second point at which participants exit the spiral lies in the period of human capital building. Educational costs can become too high for families, or students may refuse to attend school. In addition to young adults who fail to secure gainful employment after graduation, there are also those who decide not to pursue a "regular" career.[19] Most exits of LFT-4 result in a decreased economic outlook. In the case of men, this tends to suppress fertility as those who fall out of the spiral are doubtlessly less likely to form a family than those who remain within the spiral.

Low income families, on the other hand, do not or cannot participate in LFT-4, and consistent with the logic of our mechanism, they show higher fertility than middle- and high-income families (Shirahase 2009: 120-121). On first sight, this seems to contradict economic rationale and as a matter of fact, this social phenomenon is still not completely understood. However, we do know that mothers of low income families are more likely to become pregnant

[19] Terms like *furītā* and *nīto* have been used to describe parts of these young Japanese. In 2007, 1.8 million young Japanese were considered to be "*furītā*" by the Ministry of Health, Labor and Welfare (MHLW 2007) which defines "*furītā*" as being 15 to 34 year old men and unmarried women (students excluded) who work part time or desire to do so. In the same year the government counted 620,000 "nīto", a term derived from "NEET" (not in Education, Employment or Training), which in Japan refers to those 15 to 34 year olds among the not working population who are neither students nor housewives.

unintentionally and at younger age than women from higher income households.[20] If mother and father-to-be decide against abortion, they get married before the child is born. As a consequence, it is often impossible for them to enjoy higher education and fathers often end up with lower paid jobs (MHLW 2001). That lowers the opportunity costs of children, but also reduces the number of life-course alternatives for both parents. Due to the subsequent lack of financial resources, these parents tend to not invest as much into human capital building of their children as those inside the LFT-4 spiral. Consequently, educational ambitions for their offspring often remain lower. Of course, there are exceptions and members of low income families may manage to enter the spiral of LFT-4. As consequence, according to the logic of LFT-4, they or their children would gain higher education, but then would also contribute to the decline in fertility.

4. Predicting the Impact of the Economic Crisis on Fertility

How, then, does the LFTH help us in understanding the impact of the economic crisis on Japan's fertility? LFT-1 is a mechanism with a simple causal structure. Its impact comes with a time-lag of one generation and does not affect the TFR but the crude birth rate. Consequently, it cannot help to understand the impact of the economic crisis.

The effect of LFT-2 depends on how the economic crisis shapes the ideal family size of the Japanese, but with socialization processes being very complex, there seems to be no way to tell in advance. We have argued that in the case of Japan, there are solid barriers for the ideal to fall below two and that the logic of the model of social innovation does not produce clear results. To us, the impact of the economic crisis on ideal family size therefore is too unclear to base any predictions on it.

[20] According to a survey by the Ministry of Health, Labor and Welfare (MHLW 2001), 81.7 percent of mothers aged 15-19 in 2000 were married for a shorter period of time than their pregnancy lasted. For the age group 20-24 the share was 58.3 percent.

The "economic mechanism" LFT-3 seems to be suited best for the task at hand. Its first element, economic outlook as measured by first income, doubtlessly worsens, especially since the career outlook of young men is affected more severely by the crisis than middle aged and older regular employees are. The number of open positions shrinks and unemployment among the young rises. In May 2009, for example, 9.3 percent of the 15- to 24-year olds were reported to be looking for gainful employment, while the overall unemployment rate was 5 percent (Sōmusho 2009b).

The impact of the economic crisis on the second element of LFT-3, however, remains unclear. As we have argued above, since 1990 the socialization process by which adolescents develop their material aspirations has been under the influence of several economic downturns. Contrary to the assumption made by Lutz et al. (2006), we find no reason to expect that material aspirations develop independently of economic experience. The key question to understand future development of the ratio of relative income, therefore, is whether first income declines more than material aspirations. If so, fertility would be suppressed. If material aspirations fall even more than the economic outlook, fertility would be pushed upward. However, there is no reliable data by which we can measure material aspirations, and therefore the question remains unanswered. Consequently, the impact of LFT-3 on fertility also remains unclear but appears to be smaller than assumed by Lutz et al. (2006).

LFT-4, however, offers several starting points by which the impact of the economic crisis on fertility can be traced and thus suggest future development. First, educational attainment rises in value for those who have to survive on tightening labor markets. That is very much the case for men. For them, securing a stable income is paramount for family formation, but becomes harder in times of economic downturns. Women face an even tighter labor market since many Japanese companies rather employ men as they are assumed to become the major

bread-winners one day. Consequently, the number of drop-outs from LFT-4 rises among both sexes.[21]

The transition from school and university to gainful employment has become more difficult as companies have reduced the number of freshmen they employ with a regular working contract. While this reduction could still be described as modest in 2009, 2010 saw the second lowest employment rate on record. 91.6 percent found a job after graduating from high-school, 94.5 percent of graduates from state- and local government-run universities, 90.8 percent of private universities and 88.4 percent of graduates from two-year colleges.[22] With fewer of them being hired, companies apply even stricter selection criteria and the pressure is passed down the line. Positions that were filled by high school graduates before are now increasingly given to university students (RWK 2009). The currency of educational attainment, therefore, declines in value.

Those who do not have enough educational attainment are increasingly at risk (Ariga 2007; Genda and Kurosawa 2001). Many who are unable to find regular employment within a year after graduation fall out of the first labor market for good and often need to work as non-regular employees (*hiseishain*) (Ōtake 2005). Since the bubble economy went bust in 1990, Japanese companies have kept reducing the number of regular employees (*seishain*) they hire each year. According to a survey released by the Ministry of Internal Affairs (Sōmushō 2009), the share of regular employees among the 15- to 24-year old has fallen from 80 percent in 1990 to 54 percent in 2008. The Ministry of Health, Labor and Welfare reported that in 2008 only 18 percent of all companies trained non-regular employees "on the job" for a period of at least one year. Less than 20 percent of non-regular employees managed to secure a regular contract later on (MHLW 2007). Consequently, for the young men among the other 80 percent not only chances on the labor market, but also on the marriage market shrink.

[21] There also are media reports claiming that a growing number of women tries to secure their livelihood by marrying "into a salary" (Fujioka 2009).

[22] See www.mhlw.go.jp/stf/houdou/2r98520000006hau.html (access: June 14, 2010)

Those who do manage to secure a regular job do not necessarily stay there for long. As Genda (2005: 20-21) reports, suboptimal performance on the educational front forces more graduates to compromise to find a job in times of economic crisis, resulting in a growing tendency to quit sooner. Chances for them to be hired again are worse than for graduates just entering the labor market.

What does LFT-4 tell us about the impact of the economic crisis on marital fertility? As we explained above, educational costs of children are considered a primary reason for many parents to have less than their desired number of children. In many households, additional part-time income earned by the mother is considered to provide the financial resources needed to pay for better child-care, schools, *juku* and universities. Part-time employment, however, provides hardly any protection against dismissal and no unemployment benefits (Boling 2008). With the crisis, more and more companies have decided to lay off part-timers or simply not renew their contracts. An estimate by the Ministry of Health, Labor and Welfare projected that more than 200,000 non-regular workers would lose their job between October 2008 and June 2009 (MHLW 2009a).

At the same time, the need to provide good education to their offspring to many parents seems a much more urgent task in times of economic uncertainty. The consequences for fertility are obvious: With less family income, but the subjective need to invest more into human capital building of children, the gap between the desired and the actual number of children can be expected to grow. To a lesser degree that is also true for those families in which the father supplies enough income and the mother is not in gainful employment. Here the degree of time and energy invested by the mother into education of her child(ren) also rises (Benesse 2009).

Like all cohorts since the end of the bubble economy have, those children and adolescents whose socialization at school and university includes a period of economic crisis will grow up with a heightened awareness of the significance of educational attainment. If they can stay within the LFT-4 spiral, they will contribute to rising educational ambitions and attainment in the future. Of those

children whose parents lose the ability to afford sufficient educational levels, an increasing share will drop out of the spiral and thus find it more difficult to form a family and have children in later life.

5. Conclusion

Based on the circumstances born out of the economic crisis, our discussion found the low fertility trap hypothesis in its original form to be too limited to understand fertility development in Japan. We therefore put forward our model of a fourth mechanism based on education, which we believe explains more precisely and to a greater extend what the economic crisis has been doing to Japanese birthrates. We are confident that the LFT-4 also helps to predict the way these impacts connect and drive the spiraling mechanism on.

But even with our amendment, the LFTH cannot tell us whether there is any hope for Japanese fertility. Here, the questions whether the point of no return for fertility really exists and where it is, are crucial. If the assumption of McDonald (2005) and Lutz et al. (2006) is right, Japanese TFR already fell into the fertility trap when it passed the value of 1.5 in the mid 1990s. If the assumption is wrong, however, then it is important to remember that none of the mechanisms of the LFTH only works in declining direction.

Considering the very restrictive migration policy of the Japanese government, a probable scenario could be this: Once low birth rates have aggravated a lack of labor force to a certain degree, LFT-4 could change its direction. With labor demand exceeding supply, employers may be forced to offer more regular employment, offering more opportunities for school and university graduates and accepting freshman with less educational attainment. Companies may even begin to establish family friendly working conditions, especially for women, to be more attractive for the smaller number of employees. Career and infirm training then may be less of a postponing factor for marriage and childbirth, and the

educational cost of children would decrease.[23] The ratio of relative income could also rise, and LFT-1 would follow suit. Yet it remains unclear at which stage of population decline and fertility this change would happen.

[23] Universities are already taking measures to deal with the declining number of new students enrolling each year, but those universities at the end of the hierarchy are hit harder while those with good reputations are almost not affected yet. Nevertheless, more and more universities will need to make access easier to counteract a decline in applications.

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