in Thailand spontaneously to look for jobs when the Thai economy was doing very well. In the case of Burmese migrants, political reasons were also a push factor in migrating to Thailand. Since the migrants are already in the country – and Thailand also needed the workers – Thailand attempted to bring the situation under control through registration programs. Those who register, however, are only part of a larger population of unauthorized migrant workers in the country. Moreover, studies suggest that migrant workers have brought or have been joined by their families in Thailand. The long border shared by Thailand and Burma greatly facilitates the movement of people. After several failed attempts, it is hoped that the work permit system in 2004 would solve the problem of unauthorized migration. In preparation for the implementation of the new policy, Thailand has started a series of repatriation drives

• South Asia is mostly a region of origin. Except for India, the government is very much involved in overseas employment in Bangladesh, Pakistan and Sri Lanka.[8] Most migration flows from South Asia are directed to the Middle East;[9] and with the exception of Sri Lanka, all the rest deploy mostly male workers. There is also significant intraregional migration in South Asia, a large part of which is irregular migration. Some of the problems related to irregular migration have their roots in the 1947 partition, and later in the separation of Bangladesh from Pakistan in 1971. Population displacement, the redrawing of national borders, and people finding themselves on the wrong side of the border reverberate in the present as border conflicts and the blurred distinctions between citizens and "illegals."[10] In recent years, there is growing recognition that trafficking in persons, especially women and children is significant in the region, with Bangladesh and Nepal as major sources of victims who are trafficked to India. South Asia is also a source region of children – specifically boys – trafficked to the Middle East as camel jockeys.

• East Asia, except China,[11] is mostly a region of destination. Compared to receiving countries in Southeast Asia, the share of foreigners in the population or in the labor force tends to be smaller in Japan, Korea, Hong Kong and Taiwan. Despite differences in the initiation of labor migration, Japan and Korea ended up with similar policies: no admission of less skilled migrant workers and establishing a trainee program. Japan has managed to control unauthorized migration; in Korea unauthorized migration is much larger than legal migration and there is a sense that the problem has gone out of control. Various amnesty programs have not made a significant dent in reducing unauthorized migration. As critics have noted, the problem stems from the abuses in the trainee system, which breed unauthorized migration (e.g., Kim, 2003). The introduction of the work permit system in 2004 is intended to curb unauthorized migration. In contrast, Hong Kong (in the 1970s) and Taiwan (in the 1990s) designed policies to accept and regulate the importation of less skilled migrant workers. Both have managed to keep unauthorized migration at relatively low levels.

Regardless of the context, there are some commonalities that run through the different migration systems: migration is not decreasing; unauthorized migration is significant; government

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[8] There is also significant outmigration from Nepal, mostly to India, with which it has bilateral agreement (signed in 1950) providing for the free movement of people and goods. Nepali workers are also present in the Middle East and some Asian countries such as Japan, Korea and Hong Kong.

[9] The singular importance of the Middle East destinations renders South Asian countries vulnerable to policy changes and events in the Middle East.

[10] For example, the question of "illegals" is raised in India (which claims that there are Bangladeshi "illegals" in India; Bangladesh counters that these are Indian Bengalis); also, Pakistan claims that Bangladeshis

[11] Most discussion on outmigration from China focuses on unauthorized migration, including trafficking in persons.

involvement (both in the origin and destination countries) is palpable; and the limited dialogue and cooperation between countries of origin and destination.

The Inevitability of Labor Migration

Prior to the 1980s, there were some speculations that perhaps the path to development in Asia was different because it did not have to bring in migrant workers as Western Europe did in an earlier time. The World Bank (1993) study on the East Asian economic miracle and similar analyses were curiously silent on the role of labor migration in promoting and maintaining development processes in the region. Later literature and the works of migration scholars would acknowledge that the high performing economies in Asia had to import workers from the less developing countries in the region.

If an official labor migration policy were used as an indication of the need for migrant workers, indeed Japan would appear to have no need for such workers. The low proportion of foreigners in its population, and in particular, the low proportion of foreigners in its work force depart from the pattern commonly observed in other advanced economies.[12] When its economy took off in the 1970s, it did not recruit migrant workers − not in the same way that Western Europe or the Gulf countries. According to some Japanese scholars, Japan managed to meet the labor requirements of an expanding economy locally by absorbing rural-urban migrants, tapping women workers and other part-time workers (e.g., students, the elderly), working longer hours, and investing in technology and automation (cited in Kondo, 2002:416-417). Large Japanese companies also resorted to off-shore production. Small and medium-sized companies, however, could not afford automation or off-shore production. Employers in this sector, in fact, had fact been lobbying the government to import less skilled workers as early as the late 1960s (Oishi, 1995). But Japan, then and now, remains firm in adhering to a policy of not admitting less skilled workers. This reluctance and wariness about foreigners derives from the concern to preserve the country's homogeneous makeup (Kondo, 2002).[13] Without changing its policy, Japan responded to the clamor for less-skilled workers by allowing the admission of *Nikkeijin* (the "front-door"); introducing trainee program (the "side-door"); or "allowing" some unauthorized migration (the "back door") (e.g., Yamanaka, 2003).

Elsewhere in Asia, other receiving countries did not avoid importing migrant workers at some point during the development process, resulting in the formulation of policies which have varying levels of openness in acknowledging this need. The most open in this sense is Singapore, which recognized the need for foreign workers way back early on, even before its economy took off, and more importantly, before it brought in migrant workers. Singapore distinguishes between the highly skilled and the less skilled. The regulation of the latter rests on a system of quota (in order to ensure that local workers are not replaced by cheaper migrant workers) and the imposition of levies (in order to discourage employers from relying on cheap migrant workers and do away with technological innovations). Despite these measures, Singapore has not reduced its reliance on migrant workers. As of the 2000 census, foreign workers account for 29 percent of its workforce. Among the migrant workers are some 140,000 foreign domestic workers, whose work has allowed local women to join the labor market.

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[12] As of 2002, registered foreigners in Japan reached 1.8 million, percent of the total population; legal foreign workers numbered 760,000 or 1.3 percent of the labor force. Japan also has its share of unauthorized migrants, and again, the proportion is small compared to other countries.

[13] According to Komai (1995, cited in Castles, 2001:187), the Japanese people have shown little hostility towards immigrants, but this may be due to the small numbers of foreigners.

Other receiving countries – South Korea, Malaysia, Thailand, Hong Kong and Taiwan – fall in between the "ideal types" that Japan and Singapore represent. As their economies took off, these countries reached full employment, their local workers acquired more education and moved into better jobs. In the course of these changes, local workers eschew less-skilled, low-paying jobs (or what is commonly referred to as 3D jobs – dirty, difficult, dangerous), resulting in labor shortages in less competitive industries or sectors.

Jobs in manufacturing, plantations, fishing and rice mill industries, construction and domestic work became the jobs filled by migrants. Labor markets in the region, thus, are segmented into a labor market for nationals and a labor market for migrants. The experience during the crisis of 1997 confirmed that nationals and migrants occupy distinct labor niches. This was highlighted by the persistence of labor shortages in the 3D sectors at a time of high domestic unemployment. When migrants were repatriated, local workers did not move into the jobs that migrants had vacated – contrary to the expectations of policymakers. Malaysia, Thailand and Korea had a difficult time in filling migrants' jobs; as a result, they had to modify their repatriation plans to meet the labor shortage in some industries (Battistella and Asis, 1999).

One by one, therefore, the high performing economies in Asia devised a policy to admit and regulate labor migration. In 2003, the government of Korea and Thailand passed a law to shift to a work permit system. Notably, these two countries had been dealing with very large numbers of unauthorized migrant workers. After several amnesty programs in Korea and registration programs in Thailand, their government decided to establish a formal policy of hiring migrant workers, which will come into effect next year. By 2004, all receiving countries in Asia, with the lone exception of Japan, will have adopted a policy that acknowledges the need to bring in less skilled migrant workers.

Labor Migration Policies and Their Outcomes

Despite or contrary to policy intentions, labor migration has been a constant in the Asian landscape in the last 30 years, dispelling the illusion of temporary migration. This reality indicates that labor migration fills a structural need in the economy. As noted earlier, migration helps in easing labor shortages in the formal and informal sectors in the countries of destination. Similarly, in the countries of origin, the objective to keep migration temporary has been indefinitely postponed in light of unrelenting unemployment and balance of payment problems. Thus, in different ways, states have an economic interest in allowing or, in some cases, favoring migration. Recent discussions on migration and development suggest the need to mainstream migration in development processes. The role of remittances,[14] returnees and transnational communities in contributing to the development processes in the home countries are some of the issues that are currently receiving considerable attention.[15]

Various factors that facilitate and sustain migration have developed over the years. One is the migration industry; another is migrants' networks and transnational connections. The migration industry has not only retained its intermediary role in labor migration, but it has also expanded

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[14] New evidence on the role of remittances in the countries of origin seems to fuel this interest. According to Dilip Ratha of the World Bank, in 2001, workers' remittances to developing countries totaled US$72.3 billion, higher than total official flows and private non-FDI flows.

[15] The discussion, so far, has focused on the development potentials of migration on the home countries. The discussion can also be extended to examining the role of migration in supporting the development of the destination countries – this can contribute to a better understanding and appreciation of the contributions of migrants to their host societies.

considerably.[16] The migration industry has an important motivation to sustain labor migration: earnings. The exploitative practices of recruitment and employment agencies have increased the transaction costs borne by migrants. Some actors in the migration industry have also resorted to irregular practices, including involvement in smuggling and trafficking activities.

The growth and expansion of migrants' networks and transnational connections is an important development. This is an example of "globalization from below," of people harnessing resources to promote their interests. Migrants' networks are an important source of support for migrants, enabling them to tap resources (e.g., money, information) and to draw some social support in the countries of destination. In the absence of efforts to integrate migrants, social networks provide the possibility to have a community life in an otherwise hostile environment.

Despite many countermeasures against settlement, it is taking place in the countries of destination. Some migrant communities have been formed in countries such as Japan (e.g., Komai, 1995; Tajima, 2000), Malaysia (*see* Wong and Teuku Afrizal, 2003) and Thailand (*see* Amarapibal, et al., 2003). In part, labor migration has paved the way for international marriages. For example, a contributing factor in the rise in Filipino-Japanese marriages is the migration of Filipino entertainers to Japan.[17] Some of these relationships do not work out and as a result, there is a growing number of Japanese-Filipino children who have been abandoned or not recognized by their fathers (e.g., Asis, 2001). The number of international marriages is also increasing in Taiwan (*Asian Migration News*, 15 October 2003) and South Korea (Lee, 2003). The move towards settlement and the growing number of international marriages challenge assumptions of a mono-ethnic society and pave the way for the development of a multicultural society.

Although migration has persisted, the conditions under which migrants work and live are far from satisfactory. To keep migration temporary, countries of destination have set in place the following conditions:

1. Migrants can work and stay in the countries of destination for a limited duration. Workers are rotated by way of limited contracts, usually for a period of two years; contracts may be extended as agreed upon by the employer and the worker. Taiwan's single entry, 6-year maximum of work and stay, is unique in the region.[18]

2. In order to monitor workers, they are not allowed to transfer to another sector or another employer. This forces migrants to stay with an employer even under abusive conditions – or if they run away, they become "illegal" or unauthorized workers.

3. Family reunification is not allowed, which forces a separation between migrants and their families. Relationships or marriage with locals is not encouraged; some countries of destination prohibit marriage to locals, depriving migrants the possibility to form a family. In Singapore, the state's medical surveillance requires women to undergo pregnancy tests twice a year. In Singapore and Malaysia, women migrants who become pregnant are repatriated.

Oriented to controlling migration, specifically controlling migrants, these policies have had real consequences for migrants and their families:

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[16] For example, there are over a thousand licensed recruitment agencies (and an unknown number of unlicensed agencies) in the Philippines. Singapore has some 400 employment agencies.

[18] In the past, the ceiling was for two years, which was later extended to three years.

1. Migrants are admitted in the receiving countries as *workers* – as such, they can participate in the economic sector of the receiving society, but they cannot participate in its social or political life, and as had been mentioned, prospects for integration are limited.

2. These restrictions have unwittingly contributed to the pervasiveness of unauthorized migration. There are various forms of unauthorized migration, The most common seems to be cross-border flows between neighboring areas. These are largely undocumented, i.e., migrants do not carry travel and/or work documents (e.g., Southeast Asia, between Korea and China (involving ethnic Koreans). Other forms are the use of non-working visa, overstaying or running away from the original sponsor or employer.

The popular perception of unauthorized migration is that is the handiwork of migrants who violate laws. Insights from a study of unauthorized migration in Southeast Asia suggest that it is reflective of the following:
- Unrealistic migration policies
    - Migration policies do not reflect the needs of the economy; instead, migration policies seem to be influenced more by political considerations.
    - Migration policies overly limits avenues for legal migration, thereby severely restricting migrants' options to look for better working conditions or to be with their families.

- Unauthorized migration is symptomatic of the contradictions of globalization which allows for the borderless flow of goods and capital, but not the borderless flow of people. Given economic disparities and the lack of legal channels to migrate, unauthorized migration indicates migrants' assertion or claim to global citizenship.

The typical responses to unauthorized migration are more border controls, more punitive measures, or repatriation – measures which punish migrants, without addressing the other actors and institutions (including the state and its policies) which contribute to unauthorized migration. None of these had had lasting impacts on curbing the problem.

In our study of unauthorized migration in Southeast Asia, we have advanced that legal and unauthorized migration are part of one migration system. Their determinants are similar; both are also facilitated by various intermediaries. Furthermore, legal and unauthorized migrants are not two distinct groups. They only differ in their access to legal or unauthorized channels of migration (Battistella and Asis, 2003:13-14).

3. Labor migration has given rise to transnational families, or families with members located in different locations. Family separation is not new – in the past, migration has also kept families apart. What is new about transnational families is the facility with which migrants can maintain contacts with the families left behind. The contacts allowed by better and cheaper communication and transportation facilities are contributing to the development of "new" ways of being family. On the other hand, transnational families also indicate that families are forcibly separated because family members are not allowed to be together. The forced separation of family members have emotional costs that do not easily figure in the calculation of costs and benefits. Research findings point to emotional costs, especially on the part of women migrants who are separated from their own children, while they care for other children (e.g., Parreñas, 2001; Asis, 2002; Huang, Yeoh and Asis, 2003). A study in the Philippines suggests that the mother's departure is associated with lower school performance and more difficult social adjustment among young children (Battistella and Conaco, 1998). There is also concern that extended separation may cause irreparable costs to marriages, but

this is an area which has not been studied well. In the countries of origin, some changes in gender relations have been noted with the migration of women.

Overall, the prevailing migration regime in Asia exacts direct costs on migrants and their families through denial of rights. The dominant paradigm of migration has been largely economic in which migrants are viewed as workers. In considerations to maximize the benefits and minimize the costs, the protection of migrants' rights has been ignored. In Asia, the "rights-gap" has not been helped by the lack of discussion of migration in general, and migrants' rights in particular, in bilateral and regional fora.[19] An indication of the global community's reluctance to respect the rights of migrants and their families is indicated by the low ratification of the UN Convention on the Rights of All Migrant Workers and Members of Their Families. Only two countries in Asia – the Philippines and Sri Lanka – have ratified it, and they are among the 23 *sending countries* that have ratified the Convention thus far.[20]

Future Prospects
Writing in 2002, Castles called for a rethinking of the dynamics of migration under conditions of globalization. He observed that policymakers and analysts failed to anticipate actual developments in international migration in the last fifty years. He attributed this oversight to two factors: (1) assumptions in migration research, particularly the influence of national models or frameworks, and (2) lack of attention to human agency, particularly the lack of appreciation of migration as a "collective process based on the needs and strategies of families and communities" (p. 1145). Under conditions of globalization, advances in communications and transportation have facilitated flows of people, ideas and information, resulting in multiple belongings, identities, linkages and community formations which are no longer based on the national model.

Our experience in the region tells us that migration is a reality whose ramifications we need to understand rather than ignore. The trends thus far combined with persisting economic disparities suggest that migration is likely to increase rather than decrease in the future. Recent discussions about replacement migration highlight demographic factors which imply more rather than less migration. Although "objective" economic and demographic factors would argue for more migration, the passage will not be easy.

However, the gathering strength and extent of transnational communities resulting from migration portend social and political transformations. This development will, at the least, counter the controlling tendencies of states, especially the curtailment of rights to "manage migration." In Asia, there are some signs that some changes are underway. In Japan, for example, local governments are opening up their communities to multiculturalism, a marked departure from the stance of the national government. Kawasaki City has established a consultative assembly for foreign residents to hear their voice in the city administration; Maihara Town allowed permanent residents to vote in a local referendum in 2002 (Kondo, 2002:420). In Hamamatsu City, Japanese Brazilian mothers and community members have banded together to address the educational needs of migrant children (Yamanaka, 2003). Likewise in Korea, civil society has been at the forefront of efforts to draw attention to the plight of migrant workers and to introduce much-needed changes (Lee, 2003; Kim, 2003). In the countries of origin, migrant NGOs have also

[19] The concern with unauthorized migration and trafficking in persons, especially women and children, initiated regional discussions on migration. The first such regional meeting was held in Bangkok in 1999, and this was followed up by similar initiatives. Such efforts can be expanded to address the problems and dilemmas arising from legal migration.
[20] See Piper and Iredale (2003) for further discussion on the obstacles to the ratification of the Convention in Asia-Pacific.

taken governments to task for inadequate services and assistance to migrants and their families. A recent development is the move of some countries to extend voting rights to their nationals abroad and/or to consider dual citizenship.[21]

In a future of more migration in Asia, much remains to be done to promote and protect migrants' rights. It is a responsibility that cannot be left to "market forces." There is reason for hope, however, and Castles (2002:1664) put it well:

> Transnational communities resulting from migration will, through thousands of micro-strategies, seek security and humane conditions for their members. By doing this, they will probably become a major factor undermining the plans of the mighty. The future will probably be as messy as the past, and all predictions are likely to be wrong, but one thing is clear: there is no return to the neat idea of closed-off nation states with homogenous national communities.

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[21] In 2003, the Philippines passed a law allowing absentee voting and another one allowing dual citizenship. Migrant NGOs in Sri Lanka are lobbying for absentee voting for its migrant population. Pakistan and India are considering dual citizenship.

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II. 分担研究報告

第1部　韓国

韓国における出生力低下の人口学的要因

鈴木 透
（国立社会保障・人口問題研究所）

1. 緒言

本稿では韓国における出生力低下に結婚力低下と結婚出生力低下が果たした役割を評価するために、まず既存研究で用いられた分析方法について考察する。年齢別有配偶出生率(AMFRs; Age-specific Marital Fertility Rates)を用いた要因分解は、日本でも韓国でもしばしば行われて来た（阿藤, 1992, p. 51; 河野, 1995, pp. 67-71; Tuya and Mason, 1995, pp. 147-148; 国立社会保障・人口問題研究所, 1997, p.10; 김승권 외, 2002, p. 77; 전광희, 2002, pp. 90-94; Eun KS, 2003, p. 582)。これらの分析では、近年の日本や韓国における出生力低下はもっぱら結婚力低下により、結婚出生力は重要な要因ではないという結果を得た。しかし廣嶋(2001)は、晩婚化が進む状況下での有配偶出生率の問題点を指摘した。廣嶋のシミュレーションによると、年齢別有配偶出生率は晩婚化が進行する状況下で失敗する。ここではシミュレーションではなく解析モデルを用いて、年齢別有配偶出生率の問題点を解明したい。また廣嶋は結婚出生力が初婚年齢から独立と仮定したが、ここではそのような仮定をはずしより一般的な結果を追求する。

このような方法論的検討を踏まえ、韓国の出生力低下を年齢別有配偶出生力以外の方法を用いて分析する。コーホート出生力に対しては、廣嶋(1999)や岩澤(2000)の方法を適用する。ピリオド出生力に対しては、ポアソン過程を想定したモデルとテンポ歪曲の分解法を開発し、韓国の 1990 年代の出生力低下に適用する。

2. 分析枠組

分析枠組は、稲葉(1992; 1995)による。現在年齢を x、初婚年齢を a、結婚期間を y、再生産年齢の上限と下限を α および β とする。再生産期間中、死亡・離婚・死別はないとする。つまり婚姻状態は「未婚」「有配偶」の 2 状態のみ考えればよい。通常の年齢別出生率 $f(x)$ は、次のように表せる。

$$f(x) = \int_a^x \phi(a)m(a, x-a)da, \tag{2-1}$$

ただし　$\phi(a)$　年齢別初婚率
　　　　$m(a,y)$　初婚年齢別・結婚期間別結婚出生率

ここで $\phi(a)$ と $m(a,y)$ の累積関数を次のように定義しておく。$\Phi(a)$ は年齢別有配偶割合、$M(a)$ は初婚年齢別平均完結出生児数と解釈できる。

$$\Phi(x) = \int_a^x \phi(a)da. \tag{2-2}$$

$$M(a) = \int_a^{\beta-a} m(a,y)dy. \tag{2-3}$$

以下では、特に断らない限り特定年の仮想コーホートの結婚・出生行動について考える。合計出生率は、次のように表せる。

$$TFR = \int_a^\beta f(x)dx = \int_a^\beta \phi(a)M(a)da. \tag{2-4}$$

ここで以下の仮定を置く。仮定 1 については、正当化の必要はないだろう。仮定 2 は、日本ではおおむね経験的に支持される。人口動態統計と現在推計人口から求めた年齢別初婚率について、$\phi(a)/\Phi(a)$が単調減少するという仮定から逸脱する例はごく限られている。仮定 3 のうち、晩婚な夫婦ほど出生児数が少ないことは繰り返し確認されている。結婚期間については、現実には結婚直後に出生力が一時上昇し、以後低下する可能性もある。しかしこの点は単純化して、ここでは結婚期間全般について出生力は低下すると仮定する。

仮定 1. $\phi(a)$は単峰型の年齢パターンを持つ。
仮定 2. $\phi(a)/\Phi(a)$は a について単調減少する。
仮定 3. $m(a,y)$は a と y のいずれについても単調減少する。

3. 要因分解

年齢別有配偶出生率は、次のように定義される。

$$AMFR(x) = \frac{f(x)}{\Phi(x)}. \tag{3-1}$$

この式から、年齢別出生率 $f(x)$は年齢別有配偶出生率と有配偶割合の積と解釈できる。このような積の形をした指標に対し、Kitagawa (1955)は残差を生じない単純な要因分解法を提案した。ΔTFR を TFR の総変化量、ΔTFR_n を結婚行動の変化に由来する変化量、ΔTFR_f を出生行動の変化に由来する変化量とすると、分解は次のようになされる。

$$\Delta TFR = TFR_2 - TFR_1 = \int_a^{\beta+h} \{f_2(x) - f_1(x)\}dx, \tag{3-2a}$$

$$\Delta TFR_n = \int_a^{\beta+h} \{\Phi_2(x) - \Phi_1(x)\} \cdot \frac{1}{2} \left\{ \frac{f_2(x)}{\Phi_2(x)} + \frac{f_1(x)}{\Phi_1(x)} \right\}dx, \tag{3-2b}$$

$$\Delta TFR_f = \int_a^{\beta+h} \left\{ \frac{f_2(x)}{\Phi_2(x)} - \frac{f_1(x)}{\Phi_1(x)} \right\} \cdot \frac{1}{2} \{\Phi_2(x) + \Phi_1(x)\}dx. \tag{3-2c}$$

4. 晩婚化以外の変化

廣嶋はシミュレーションによって、少婚化・少産化・晩産化といった晩婚化以外の変化が生じている場合、要因分解に問題が生じないことを示した。ここではこの結果が、結婚出生力と初婚年齢の独立性を仮定しなくても成り立つ一般的な結果であることを、解析的に確認しておく。

4-1. 一様な少婚化

$\phi(a) \to c\ \phi(a)$ という年齢別初婚率の一様変化が生じたとする。$c<1$ なら少婚化だが、多婚化でも結論は変わらない。(2-1)(2-2)より、新しい年齢別有配偶割合と年齢別出生率は $c\Phi(x)$および $c f(x)$となり、従って年齢別有配偶出生率は旧来の $f(x)/\Phi(x)$から変化しない。要因分解は結婚行動の変化だけが合計出生率の変化をもたらしたという結論を生じ、これは正しい。

$$\Delta TFR_n = \int_a^\beta \{c\,\Phi(x) - \Phi(x)\} \cdot \frac{1}{2}\left\{\frac{f(x)}{\Phi(x)} + \frac{f(x)}{\Phi(x)}\right\}dx$$

$$= (c-1)\int_a^\beta f(x)dx = TFR_1 - TFR_2.$$

$$\Delta TFR_f = \int_a^{\beta+h}\left\{\frac{f(x)}{\Phi(x)} - \frac{f(x)}{\Phi(x)}\right\} \cdot \frac{1}{2}\{c\,\Phi(x) + \Phi(x)\}dx = 0.$$

4-2. 一様な少産化

結婚出生力が $m(a,y) \rightarrow c\,m\,(a,y)$ と一様に変化したとする。$c<1$ なら少産化だが、多産化でも結論は変わらない。年齢別有配偶割合 $\Phi(x)$ は変化せず、(2-1) より新しい年齢別出生率は $c\,f(x)$ となり、年齢別有配偶出生率も $c\,f(x)/\Phi(x)$ と旧来の c 倍になる。要因分解は出生行動の変化だけが合計出生率の変化をもたらしたという結論を生じ、これは正しい。

$$\Delta TFR_n = \int_a^\beta \{\Phi(x) - \Phi(x)\} \cdot \frac{1}{2}\left\{c\frac{f(x)}{\Phi(x)} + \frac{f(x)}{\Phi(x)}\right\}dx = 0.$$

$$\Delta TFR_f = \int_a^{\beta+h}\left\{c\frac{f(x)}{\Phi(x)} - \frac{f(x)}{\Phi(x)}\right\} \cdot \frac{1}{2}\{\Phi(x) + \Phi(x)\}dx$$

$$= (c-1)\int_a^\beta f(x)dx = TFR_1 - TFR_2.$$

4-3. 一様な晩産化

結婚出生力が $m(a,y) \rightarrow m\,(a,y\text{-}h)$ と結婚期間について h 年水平シフトしたとする。この場合、結婚後 h 年間は出生がないと解釈できる。新しい年齢別出生率は $f(x\text{-}h)$ で、h 年水平シフトする。従って TFR は変化しない。要因分解は $\Delta TFR_n = \Delta TFR_f = 0$ を示し、これは正しい。

$$\Delta TFR_n = \int_a^\beta \{\Phi(x) - \Phi(x)\} \cdot \frac{1}{2}\left\{\frac{f(x-h)}{\Phi(x)} + \frac{f(x)}{\Phi(x)}\right\}dx = 0.$$

$$\Delta TFR_f = \int_a^{\beta+h}\left\{\frac{f(x-h)}{\Phi(x)} - \frac{f(x)}{\Phi(x)}\right\} \cdot \frac{1}{2}\{\Phi(x) + \Phi(x)\}dx$$

$$= \int_a^{\beta+h} f(x-h)dx - \int_a^{\beta+h} f(x)dx = 0.$$

5. 晩婚化と要因分解の失敗

表 1 は晩婚化が生じた場合の要因分解の失敗に関する廣嶋のシミュレーションの一部である。前述のように廣嶋は結婚出生力と初婚年齢の独立性を仮定しており、ここでは $m(1) = 1, m(2) = 1, y>2$ については全て $m(y) = 0$ としている。従って年齢別出生率は $f(x) = \phi(x\text{-}1) + \phi(x\text{-}2)$ ときわめて単純化される。晩婚化は $\phi_2(x) = \phi_1(x\text{-}1)$ と、1 歳シフトするとされる。この状況では TFR は 2.0 から変化せず、$\Delta TFR = 0$ である。しかし上の晩産化の場合と異なり、要因分解は結婚行動の変化は TFR を引き下げる方向に作用し、実際には変化していない出生行動は TFR を引き上げる方向に作用したと主張している。これは明らかに年齢別有配偶出生率を用いた要因分解に問題があることを示している。

表1. 晩婚化状況下の要因分解

x	$\phi_1(x)$	$\Phi_1(x)$	$f_1(x)$	$f_1(x)/\Phi_1(x)$	$\phi_2(x)$	$\Phi_2(x)$	$f_2(x)$	$f_2(x)/\Phi_2(x)$	$\Delta(x)$	$\Delta_n(x)$	$\Delta_f(x)$
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.10	0.05	0.05	1.00	0.05	0.00	0.00	0.00	-0.05	-0.03	-0.03
18	0.15	0.15	0.15	1.00	0.10	0.05	0.05	1.00	-0.10	-0.10	0.00
19	0.20	0.30	0.25	0.83	0.15	0.15	0.15	1.00	-0.10	-0.14	0.04
20	0.20	0.50	0.35	0.70	0.20	0.30	0.25	0.83	-0.10	-0.15	0.05
21	0.15	0.70	0.40	0.57	0.20	0.50	0.35	0.70	-0.05	-0.13	0.08
22	0.10	0.85	0.35	0.41	0.15	0.70	0.40	0.57	0.05	-0.07	0.12
23	0.05	0.95	0.25	0.26	0.10	0.85	0.35	0.41	0.10	-0.03	0.13
24	0.00	1.00	0.15	0.15	0.05	0.95	0.25	0.26	0.10	-0.01	0.11
25	0.00	1.00	0.05	0.05	0.00	1.00	0.15	0.15	0.10	0.00	0.10
26	0.00	1.00	0.00	0.00	0.00	1.00	0.05	0.05	0.05	0.00	0.05
Total			2.00				2.00		0.00	-0.66	0.66

出所:廣嶋(2001), p. 177.

廣嶋の目的は、晩産化進行中では要因分解が失敗し得ることを示すことだったので、失敗の例をひとつ提示するだけで十分だった。ここでは解析的アプローチにより、より一般的な結果を追求する。晩婚化 $\phi(x) \rightarrow \phi(x-h)$ が生じたとき、新しい有配偶割合と年齢別出生率は次のようになる。

$$\Phi_2(x) = \int_a^x \phi(a-h)\,da = \int_a^{x-h} \phi(a)\,da = \Phi(x-h). \tag{5-1}$$

$$f_2(x) = \int_a^x \phi(a-h)\,m(a, x-a)\,da. \tag{5-2}$$

まず、晩婚化が生じても TFR が変化しないという結果は結婚出生力と初婚年齢の独立性の仮定に依存し、一般には TFR は変化することを示す。(2-1)の積分の順序を変えて(2-3)を代入すると、新しい TFR は次のように表せる。

$$TFR_2 = \int_a^{\beta+h} \phi(a-h)M(a)\,da. \tag{5-3}$$

廣嶋のように結婚出生力と初婚年齢の独立性を仮定すれば、$M(a)$は単に定数 M となり、$TFR_2 = TFR_1$ となることが確認できる。より一般的な場合、仮定3により $M(a)$は減少関数と考えてよい。従って $M(a)$は$\phi(a-h)$が$\phi(a)$を下回る前半部分により大きなウェイトをかけるため、TFR_2は TFR_1より小さくなるだろう。つまり晩婚化は TFR の低下を生じる。

次に、本当は 0 であるべき結婚出生力の効果 ΔTFR_fは、常に総効果 ΔTFR を上回ることが示される。(3-2c)を展開して$f_1(x)$と$f_2(a)$の定義を代入し、積分の順序を変えると、次の結果が得られる。

$$\Delta TFR_f = \frac{1}{2}\Delta TFR + \frac{1}{2}\left\{\int_a^{\beta+h} \phi(a-h)\,M^+(a)\,da - \int_a^{\beta+h} \phi(a)\,M^-(a)\,da\right\}, \tag{5-4a}$$

$$\text{ただし}\quad M^+(a) = \int_a^{\beta+h} \frac{\Phi(x)}{\Phi(x-h)}\,m(a, x-a)\,dx, \tag{5-4b}$$

$$M^-(a) = \int_a^{\beta+h} \frac{\Phi(x-h)}{\Phi(x)}\,m(a, x-a)\,dx. \tag{5-4c}$$

(5-4b)(5-4c)より $M^-(a) < M(a) < M^+(a)$ だから、(5-4a)の右辺第2項は $\Delta TFR/2$ より大きい。つまり正しい関係は $\Delta TFR_f = 0$ かつ $\Delta TFR_n = \Delta TFR$ であるのに、年齢別有配偶出生率を用いた要因分解は $\Delta TFR_f > \Delta TFR$ という誤った結果を生じる。

6. 深刻な失敗

ΔTFR_f の正負にかかわらず、ΔTFR_n は常に負である。もし両方とも負なら、結婚行動も出生行動もともに TFR 低下に寄与したという穏当な結論になる。しかし ΔTFR_f が正なら、結婚出生力が上昇していることになり、こちらの方が深刻な誤りを生じる。真の結婚出生力 $m(a,y)$ が変化していないのに年齢別有配偶出生率が上昇するとしたら、真の結婚出生力が低下しているのに気づかれないこともあり得る。その場合、廣嶋(2000, p. 1)が主張するように結婚出生力低下が不当に軽視され政策的努力の方向を誤らせる結果になりかねない。

ここではこうした「深刻な失敗」が生じる条件を特定するために、晩婚化によって年齢別有配偶出生率が上昇する条件について考察する。まず任意の現在年齢を x、晩婚化の度合いを h として、次の関数を定義する。

$$H(a) = \frac{\phi(a-h)}{\Phi(x-h)} - \frac{\phi(a)}{\Phi(x)}, \quad a \le x. \tag{6-1}$$

年齢別有配偶出生率の変化は、$H(a)$ を用いて次のように表される。

$$\frac{f_2(x)}{\Phi_2(x)} - \frac{f_1(x)}{\Phi_1(x)} = \int_a^x H(a)m(a,x-a)da. \tag{6-2}$$

ウェイトである $m(a,x-a)$ が全て1なら、$H(a)$ の積分は0になる。初婚開始年齢の α 歳付近では $H(a)<0$ であり、現在年齢である x 歳付近では仮定2より $H(a)>0$ となる。従ってウェイトである $m(a,x-a)$ が a に関し増加関数であれば、$H(a)>0$ となる後半を強調するためウェイトつき積分の結果は正になり、年齢別有配偶出生率は上昇することになる。$m(a,x-a)$ が a に関する増加関数であるためには、$m(a,y)$ の初婚年齢 a に関する傾きより結婚期間 y に関する傾きが大きければよい。

このように「深刻な失敗」は数学的必然ではなく、$m(a,y)$ の形状に依存する。仮に $m(a,x-a)$ が a に関する減少関数であれば、深刻な失敗は生じない。しかしその場合、再生産年齢後期における年齢別出生率の上昇は決して観察されないだろう。なぜなら(6-3)式で $\phi(a-h)-\phi(a)$ は平均初婚年齢付近までは負であり、$m(a,x-a)$ が減少関数ならこの前半部分にウェイトがかかるため、年齢別出生率は全ての年齢で低下するはずだからである。

$$f_2(x) - f_1(x) = \int_a^x \{\phi(a-h) - \phi(a)\}m(a,x-a)da < 0. \tag{6-3}$$

しかし現実には、30歳以降で年齢別出生率が上昇する事例がしばしば観察される。このことは $m(a,x-a)$ が実際には増加関数で、従って「深刻な失敗」を生じやすいことを示している。

なお、(6-2)と(6-3)を比較すると、晩婚化による年齢別有配偶出生率の上昇は、年齢別出生率の上昇より起こりやすいことがわかる。(6-3)の{ }内は基準化されていない初婚率の差で、$x<\beta$ ならこの積分は常に負である。特に x が最頻値より若い場合、$\phi(a-h)$ が $\phi(a)$ を上回る部分がないため、年齢別出生率が増加することはない。これに対し $H(a)$ は基準化された初婚率の差であり、$\phi(a-h)$ が $\phi(a)$ を上回る部分が必ず存在する。従って $m(a,x-a)$ の傾き
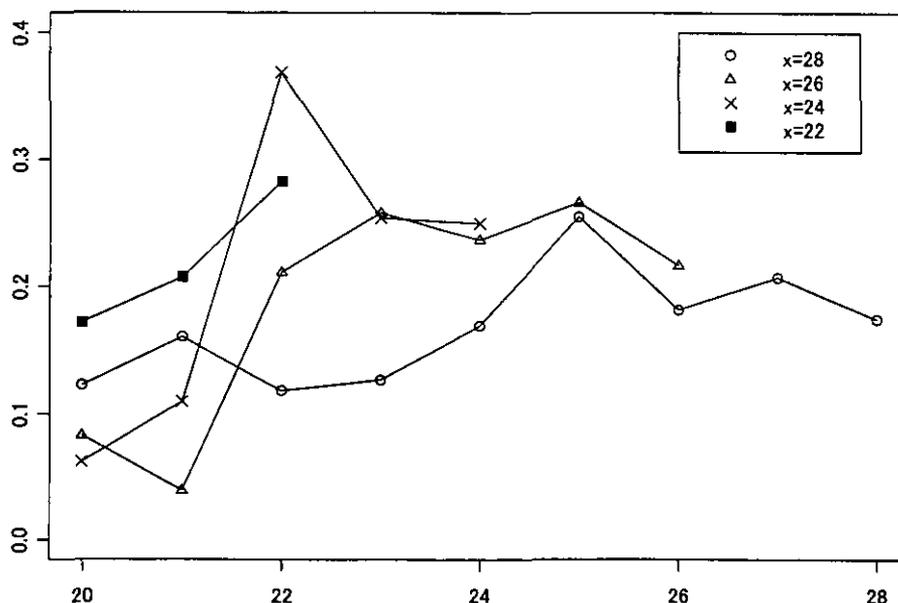
が十分に大きければ、若い年齢でも年齢別有配偶出生率は上昇し得る。

図1. 初婚年齢別、結婚持続期間別出生率（第4回世帯動態調査, 1999）

図1は日本における直接的証拠として、国立社会保障・人口問題研究所の第4回世帯動態調査（1999年）から推定した $m(a,x\text{-}a)$ を示したものである。標本誤差のためか多少の上下動はあるが、$m(a,x\text{-}a)$ がおおむね増加関数であることがわかる。

7. 虚偽の有配偶出生率上昇

深刻な失敗を生じる $m(a,y)$ のパターンはまた、真の結婚出生力である $m(a,y)$ が低下しているにもかかわらず年齢別有配偶出生率 $f(x)/\Phi(x)$ は上昇を示すという事態を生じる。ここではそのような「虚偽の上昇」が起きる条件について考える。

晩婚化 $\phi(x) \rightarrow \phi(x\text{-}h)$ と同時に、$m(a,y) \rightarrow c\,m(a,y)$ という結婚出生力の一様変化も生じたとしよう。このとき年齢別出生率は、(5-2)に c を乗じて、

$$f_2(x) = c\int_a^x \phi(a-h)\,m(a,x-a)\,da. \tag{7-1}$$

ここで特定の年齢 x について、$m(a,x\text{-}a)$ が次の直線で近似できると仮定する。

$$m(a,x-a) = u(x) + v(x)a. \tag{7-2}$$

このとき、年齢別有配偶出生率の変化は、

$$\frac{f_2(x)}{\Phi_2(x)} - \frac{f_1(x)}{\Phi_1(x)} = \left[u(x) + v(x)\{\mu(x-h)+h\}\right]c - u(x) - v(x)\mu(x). \tag{7-3}$$

ただし $\mu(x)$ は、x 歳までに結婚した女子の平均初婚年齢である。

$$\mu(x) = \frac{1}{\Phi(x)}\int_a^x a\,\phi(a)\,da. \tag{7·4}$$

x 歳の年齢別有配偶出生率が上昇するためには、(7·3)が正であればよい。それを c について解くと、

$$c > \frac{\mu(x) + u(x)/v(x)}{\mu(x-h) + h + u(x)/v(x)}. \tag{7·5}$$

もし $\mu(x-h) + h$ が $\mu(x)$ より大きければ右辺は1未満となり、$c<1$ でも年齢別有配偶出生率の上昇が起こり得る。これは、全年齢で真の結婚出生力 $m(a,y)$ が低下しているにもかかわらず、どの年齢の有配偶出生率も上昇する可能性があることを意味し、深刻な事態と言える。

ここでは仮定2が満たされれば、$\mu(x-h) + h$ は常に $\mu(x)$ より大きいことを示す。まず(7·4)に部分積分の公式を当てはめると、$\mu(x)$ は次のように表せる。

$$\mu(x) = x - \frac{1}{\Phi(x)}\int_a^x \Phi(a)\,da. \tag{7·6}$$

このため $\mu(x-h) + h > \mu(x)$ は、次の関係と同値である。これは $\Phi(a)$ のグラフで、高さの増分より面積の増分の方が大きいことを意味している。

$$\frac{\Phi(x)}{\Phi(x-h)} < \frac{\int_a^x \Phi(a)\,da}{\int_a^{x-h} \Phi(a)\,da}. \tag{7·7}$$

これを証明するには、指数関数との比較を行えばよい。まず区間 $(x-h,\ x)$ の $\Phi(a)$ の平均増加率を r と置く。

$$r = \frac{1}{h}\log\frac{\Phi(x)}{\Phi(x-h)}. \tag{7·8}$$

$\Phi(x-h)$ と $\Phi(x)$ を通る増加率 r の指数曲線を $z(a)$ とする。

$$z(a) = z(a)\,e^{r(a-a)}, \tag{7·9a}$$

$$\text{ただし}\quad z(a) = \frac{\Phi(x)^{\frac{x-a}{h}+1}}{\Phi(x-h)^{\frac{x-a}{h}}}. \tag{7·9b}$$

$z(x-h)$ と $z(x)$ の比は、もちろん $\Phi(x-h)$ と $\Phi(x)$ の比と同じで、e^{rh} になる。

$$\frac{z(x)}{z(x-h)} = \frac{e^{r(x-a)}}{e^{r(x-h-a)}} = e^{rh}. \tag{7·10}$$

$z(a)$ の下の面積を $Z(a)$ とする。

$$Z(a) = \int_a^a z(t)dt = \frac{z(\mathrm{a})}{r}\left(e^{r(a-\mathrm{a})} - 1\right) \tag{7-11}$$

$Z(x\text{-}h)$ と $Z(x)$ の比は、次のようになる。

$$\frac{Z(x)}{Z(x-h)} = \frac{e^{r(x-\mathrm{a})} - 1}{e^{r(x-h-\mathrm{a})} - 1}. \tag{7-12}$$

これは $r>0$, $\alpha<x\text{-}h$ という条件下では(7-10)より大きいことが確認できる。

$$\frac{Z(x)}{Z(x-h)} - \frac{z(x)}{z(x-h)} = \frac{e^{rh} - 1}{e^{r(x-h-\mathrm{a})} - 1} > 0. \tag{7-13}$$

次に、$\log z(a)$ と $\log\Phi(a)$ の大小関係を考える。当然 $\log z(a)$ は、次のような直線になる。

$$\log z(a) = \log z(\mathrm{a}) + r(a - \mathrm{a}). \tag{7-14}$$

一方仮定2は、$\log\Phi(a)$ が左に凸であることを意味する。

$$\left\{\frac{\phi(a)}{\Phi(a)}\right\}' = \left\{\log\Phi(a)\right\}'' < 0. \tag{7-15}$$
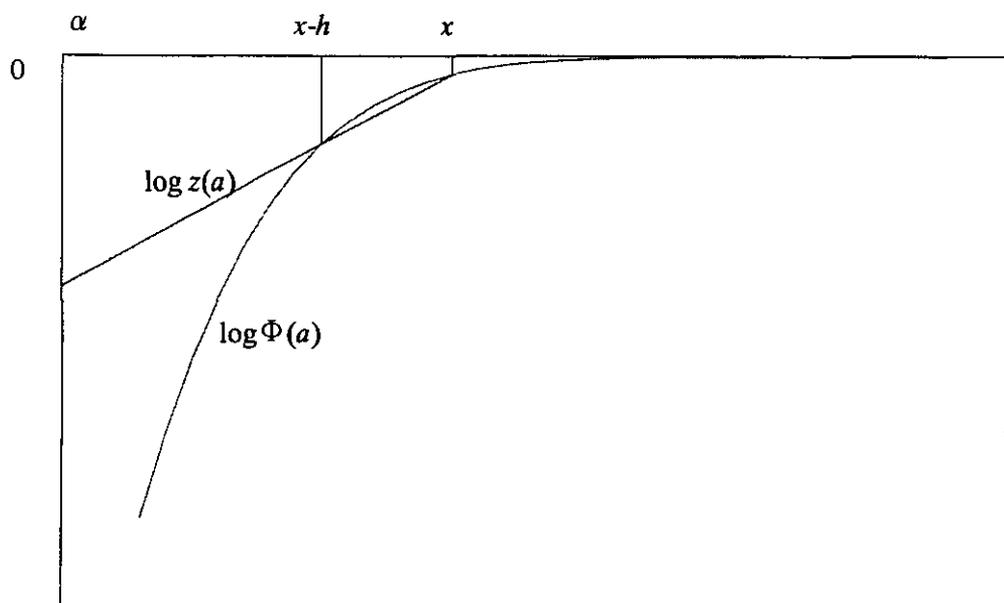

図2. $\log\Phi(a)$ と $\log z(a)$ の大小関係

この形状から、図2のように $x\text{-}h$ 歳未満では $\log\Phi(a)$ は $\log z(a)$ を下回り、区間 $(x\text{-}h,x)$ で

は上回る。このことから、$\Phi(a)$ の下の面積は x-h 歳未満では $Z(a)$ を下回り、区間 $(x$-$h,x)$ では上回ることがわかる。このため次の関係が成り立ち、(7-7)が証明される。

$$\frac{\Phi(x)}{\Phi(x-h)} = \frac{z(x)}{z(x-h)} < \frac{Z(x)}{Z(x-h)} < \frac{\int_a^x \Phi(a)da}{\int_a^{x-h} \Phi(a)da}.$$

8. 結婚期間別有配偶出生率

　真の結婚出生力 $m(a,y)$ を求めるには、年齢別・結婚期間別の有配偶女子人口と出生数が必要で、データへの要求は非常に高い。このため、より入手しやすい年齢別の有配偶女子人口と出生数があれば計算できる年齢別有配偶出生率が広く用いられ、分析の失敗につながると考えられる。では年齢の代わりに、結婚期間別の有配偶女子人口と出生数があれば、要因分解はうまく行くのだろうか。

　結婚後 y 年間再生産年齢にとどまるためには、妻は β-y 歳までに結婚しなければならない。従って結婚期間 y 年の妻の出生数は、

$$B(y) = \int_a^{\beta-y} \phi(a)m(a,y)da. \tag{8-1}$$

エクスポージャは、$m(a,y)$ の代わりに 1 を使って、

$$E(y) = \int_a^{\beta-y} \phi(a)da = \Phi(\beta - y). \tag{8-2}$$

結婚期間別有配偶出生率は、次の形になる。

$$\frac{B(y)}{E(y)} = \frac{\int_a^{\beta-y} \phi(a)m(a,y)da}{\Phi(\beta - y)}. \tag{8-3}$$

　この操作によって正しい結婚出生力が得られるのは、廣嶋が仮定したように $m(a,y)$ が初婚年齢から独立の場合に限られる。一般には $m(a,y)$ は分離されず、従って年齢別有配偶出生率の場合と同じ問題を生じるだろう。

　ただし結婚出生力が初婚年齢と独立であれば正しい値が得られるという点では、結婚期間別有配偶出生率は年齢別有配偶出生率より優れているといえる。年齢別有配偶出生率が正しいためには、夫婦出生力が初婚年齢にも結婚期間にも依存しない完全な定数でなければならない。これは以下で述べる定常ポアソン過程に該当する。

9. コーホート出生力低下の要因分解

　年齢別有配偶出生率によらない要因分解法として、再生産終了時のコーホートの既婚割合と平均出生児数を用いる方法がある。x 歳時に未婚だった女子の出生数は 0 とすると、コーホート x 歳時の累積出生率は、

$$F(x) = \Phi(x) N(x). \tag{9-1}$$

　　　　　　ただし　$\Phi(x)$　　x 歳時既婚割合
　　　　　　　　　　$N(x)$　　x 歳時既婚者の平均出生児数

Kitagawa の分解法を用いれば、総変化 $F_2(x) - F_1(x)$ に対し結婚力の効果は $0.5 \{\Phi_2(x) - \Phi_1(x)\} \{N_2(x) + N_1(x)\}$、結婚出生力の効果は $0.5 \{\Phi_2(x) + \Phi_1(x)\} \{N_2(x) - N_1(x)\}$ となる。廣嶋(1999)はこの方法によっており、年齢別初婚率と出生率をそれぞれ累計して $F(50)$ と $\Phi(50)$ を得、$N(50) = F(50)/\Phi(50)$ として既婚者の平均出生児数を得ている。

表2. 既婚割合と既婚女子の平均出生児数による韓国出生力低下の要因分解

年齢	$F(x)$ 既婚割合		$N(x)$ 既婚女子の 平均出生児数		$F(x)N(x)$ 全女子の 平均出生児数		要因分解		
							$\varDelta$	$\varDelta m$	$\varDelta n$
	1990年	2000年	1990年	2000年	1990年	2000年	総変化	結婚力	結婚出生力
40~44歳	0.9809	0.9740	2.7688	2.0072	2.7158	1.9551	-0.7607	-0.0163	-0.7444
45~49歳	0.9896	0.9826	3.3269	2.3125	3.2924	2.2722	-1.0202	-0.0199	-1.0003
50~54歳	0.9940	0.9894	3.8884	2.7184	3.8651	2.6896	-1.1755	-0.0152	-1.1603
55~59歳	0.9961	0.9930	4.2632	3.2717	4.2466	3.2488	-0.9978	-0.0116	-0.9862
60~64歳	0.9975	0.9951	4.4179	3.8877	4.4067	3.8688	-0.5379	-0.0097	-0.5282

資料：KOSIS.

韓国の場合、センサスから女子の 5 歳階級別既婚割合と既婚女子の平均出生児数が得られる。表 2 は 1990 年と 2000 年の両センサスに基づき、40~64 歳の 5 つの 5 歳階級について $\Phi(x), N(x)$ を求め、要因分解を行ったものである。この 10 年間で 40 歳以上の既婚割合はほとんど変化していないのに対し、平均出生児数は急激に低下している。このため、結婚力の効果を既婚割合だけで代表させる方法では、結婚力は出生力低下にほとんど寄与していないという結論になる。

この方法はコーホートの結婚のタイミングを度外視しており、晩婚な妻ほど少産であるという関係が反映されていない。従って晩婚化が進行しても、皆婚規範がまだ維持されている段階では、結婚力の貢献を過小評価することになる。結婚タイミングの効果を明示的に取り入れている方法としては、岩澤(2002)の方法がある。この方法では、累積出生率は既婚割合、死離別調整係数、初婚年齢別累積出生率の積で表される。このうち死離別を無視すると、コーホート x 歳時の累積出生率は、

$$F(x) = \Phi(x) N^*(x) \frac{N(x)}{N^*(x)}. \tag{9-2}$$

ただし　$\Phi(x)$　　x 歳時既婚割合
　　　　$N(x)$　　x 歳時既婚者の平均出生児数
　　　　$N^*(x)$　　x 歳時既婚者の反事実的平均出生児数

反事実的平均出生児数 $N^*(x)$ は、コーホートが初婚年齢別平均出生児数の標準パターン $M^*(a)$ に従った場合に実現する既婚者の平均出生児数である。x 歳までの初婚年齢の密度関数を $\rho(a)$ とすると、

$$N^*(x) = \int_a^x \rho(a) M^*(a) da = \int_a^x \frac{\phi(a)}{\Phi(x)} M^*(a) da.$$

$M^*(a)$ の代わりに当該コーホートの初婚年齢別平均出生児数 $M(a)$ を使い、$x = \beta$ とすれば $CFR / \Phi(\beta)$ が得られることは、(2-4)との比較から容易に理解できよう。$N^*(x)$ は結婚出生力が標準パターン $m^*(a,y)$ を維持し、結婚力だけが変化した場合に実現する既婚者の平均出生児数であり、$N(x)$ と $N^*(x)$ の差は結婚力の効果と解釈できる。

岩澤の方法では結婚出生力の詳細なパターン $m(a,y)$ までは要求しないが、少なくとも既婚