

The potential effect of changes in sex ratios on the ‘marriage market’, fertility and employment: A review of theory and evidence*

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Introduction

In New Zealand, in all age groups under 20, historically there have been more men than women. This reflects a naturally occurring ratio by which the number of boys born is higher relative to that of girls. Aside from the two world wars, from the time official data have been collected through to the early 1980s there had also been more men than women in the prime working and couple forming age groups (20-49). However, since the early 1980s among prime working-age groups this ratio has reversed, with official statistics indicating a growing number of women relative to men.

An exploratory study, funded by the Department of Labour's Future of Work Contestable Fund, investigated possible reasons for the changes in sex ratios (Callister, Bedford and Didham, 2006). However, a subsidiary objective of the project was to explore the possible implications of changes in sex ratios on couple formation and on fertility. Underlying this objective is an assumption that changes in household type and in fertility may ultimately have an effect on labour markets. While empirical data on possible links between changing sex ratios, couple formation and fertility are contained in the main report, this background paper explores theory and literature on this topic.^{1 2}

Possible relationships between ‘marriage markets’, fertility, and employment involve complex aspects of human behaviour. The studies cited in this paper only scratch the surface of possible associations or causal relationships. I begin with a discussion of fertility decisions and how these might relate to marriage market decisions and employment patterns. I then look at how changing sex ratios might influence decisions made in the ‘marriage market’. This includes a consideration of literature on: absolute ratios; ratios of the number of women to employed men; and the ratio of women to men with educational qualifications.

‘Marriage markets’ and fertility

In most OECD countries, low fertility rates are a key reason behind the ageing of the population and potential future labour shortages and are seen as an important policy issue. While New Zealand’s total fertility rate is still higher than that found in most OECD countries, concerns have been expressed that fertility has been declining, particularly amongst well-educated women (Sceats 2003).³

¹ This paper is based on the assumption that, if seeking a relationship, most men and women are seeking a heterosexual relationship.

² Except where specifically noted, sex ratios in this paper refer to the number of men relative to women. In the main paper, however, the ratio is calculated as the ratio of women to men.

³ In terms of a case study supporting the idea that well-educated women have low levels of fertility, Grant and Yang (2003) analysed biographies of 353 women selected for inclusion in two volumes of a

Both theory and empirical studies suggest a wide range of influences on the level of fertility in particular societies (e.g. Birrell 2003, Callister 2002, Didham 2001 2004, Grant et al 2004, McDonald 2000, Rønsen 2001). These include:

1. Economic security/insecurity
2. Women's increasing education and employment rates and, with this, an increasing opportunity cost of childrearing
3. Society and employer provision of "family friendly" benefits
4. Cultural norms
5. Availability of contraception/abortion
6. Infant mortality rates (at least, in developing countries)
7. Provision of societal income support, particularly in old age
8. Population policy (e.g. China)
9. Welfare policy (e.g. support of sole parents to have children)
10. 'Imported' fertility – such as allowing migration of larger families from developing countries into industrialised countries (e.g. United States)
11. Loss of jobs and earning power of low-skilled men

Imbalances in sex ratios aside, how the 'marriage market' might influence fertility is already a complex puzzle. For example, using Norwegian data Naz et al (2002) found that married women with high levels of education have more children, compared with other women. The researchers, however, also found:

- The relationship between a married women's level of education and completed fertility became insignificant after controlling for their husbands' characteristics.
- Highly educated married men have more children, compared with poorly educated married men

Given that husbands' education was found to have a positive effect on women's fertility, the results suggested that the effect of education on married women's fertility works through the process of assortative mating. That is well educated men tend to have well educated partners.

Perhaps more importantly when considering the effect of sex ratio imbalances, Naz et al also found that for unmarried women, the relationship between education and fertility was negative. That is, increasing levels of education for unmarried women lowers fertility amongst that group.

Naz et al, like many other researchers, also note that aggregate OECD statistics suggest that an increased level of education among women leads to a higher incidence of women living on their own. This means the effect of education on overall fertility decreases might be due to the initial decision of marriage or cohabitation, and not an effect of education, by itself, on fertility within couples. These effects do not take into account the potential effect of changing sex ratios, but an increase in women's

New Zealand dictionary of biography. Over half the women had no children and were either unmarried or, if married, childless.

education along with a shortage of men would seem likely to increase the number of well educated women living on their own, and thus reduce fertility.

Through the process of assortative mating, two kinds of indirect effects of females' education can take place. First, marrying a man with higher education and correspondingly higher income works as an income effect that may influence fertility positively. Second, assortative mating may also positively affect fertility through specialisation of roles if women are 'marrying up' and are thus able to specialize in household work. But if there is a shortage of men to partner well-educated women, there may be greater pressure on women to be 'breadwinners' rather than 'caregivers'. Unless the men they are marrying have: strong caregiving ideals and/or caregiving is strongly supported by the state through policies such as independent rights to paid parental leave for fathers; or care outside the home is better supported, such as through free childcare, this may reduce fertility.

Sex ratios and the marriage market

While education is an important factor in assortative mating, age is also very important. On average, males in couples tend to be slightly older than females (Bergstrom 1997). However, Bergstrom notes that the age differential tends to be larger in traditional societies but has diminished over time. Ryan (2004) has studied the changing age gap in marriage in New Zealand. Ryan notes that between 1963 and 2003 changes identified in age differences at the time of marriage included:

- the median age difference has declined (from 2.66 years in 1963 to 1.94 years in 2003)
- the proportion of marriages where the bride is older has increased (women marrying younger men)
- the proportion of marriages where the bridegroom is older has decreased
- the proportion of marriages where the bride and bridegroom are the same age has increased slightly
- age differences are more pronounced in 2003 than in 1963.

While not studied in such detail, research on all New Zealand couples (legally married and defacto) suggests that age gaps and the changes over time are similar for defacto couples (Callister 1998).

Given the age gap in marriages, along with differing sizes of birth cohorts, there will be cycles whereby men in one cohort outnumber women in a bordering younger age cohort, with women outnumbering men at other times. However, other factors can influence sex ratios. For example, wars have traditionally reduced the number of men relative to women and in the early colonisation of New Zealand, gendered migration meant Pakeha men vastly outnumbered Pakeha women (Arnold 1982). The high rate of marriage between Maori women and Pakeha men was one result of this. If women outnumber men then there will be more competition for eligible men. More women will live on their own. Or, in a more liberal environment, some women will form relationships with other women. Men will also have more opportunity to leave their partner and to repartner.

It is possible that uneven sex-ratios have always had some impact on family formation, but in some societies they also affected family type. Differences in

numbers of men and women have been associated with the practice of polygamy (either formally or informally) and, less commonly, polyandry in some societies (Murstein 1974).

In contemporary industrialised societies, the potential for imbalances in sex-ratios to influence behaviour in marriage and labour markets has been discussed in the economics literature (e.g. Grossbard-Shechtman 1993); in the sociological assortative mating literature (e.g. South and Lloyd 1992); and in the demography literature (e.g. Schoen 1983, Clarke 2000). Another economist, Silberberg (1990), sought an economic explanation for the rise in women's labour force participation in the past generation (i.e. up to 1990). Women in the marrying age groups in the 1960s faced a shortage of men therefore more women remained single and therefore entered the labour force in greater numbers. However, those that did marry followed the pattern of the early 20th century by marrying relatively young and having children early. By the 1970s the behaviour of women who married was changing. Women were marrying later (having established a career) and having smaller families. In a possible feedback from changing sex ratios, it has also been suggested (Keyfitz and Caswell 2005) that there is a relationship between sex ratio at birth and the age of the mother, though the evidence for this is, in fact, very slim.

Grossbard-Shechtman (later known as Grossbard) has also put forward both theoretical and empirical evidence that sex ratios affect both couple formation and women's patterns of paid work. Grossbard (2005) notes that sex ratios in the United States (as defined by the number of men to women) decreased dramatically around 1965, when larger cohorts of women born during the late 1940s and early 1950s became old enough to marry. She notes that, assuming a fixed age difference at marriage of two years when entering marriage markets, these women experienced the lowest sex ratios in the 20th century. She calculates that for every 100 women born in the years 1946 to 1950, there were 87 men born in the years 1944 to 1948, implying a shortage of 13 men for every 100 women. She goes onto argue that no other cohort of United States women born in the twentieth century experienced such a marriage squeeze when reaching marriageable age. Grossbard argues that the low sex ratios experienced by post-World-War II cohorts help explain the big increase in welfare dependency in the early 1970s.

There has also been much research within sociology on the impact of sex-ratios, particularly on the marriage and childrearing patterns of African Americans (e.g. Cready, Fossett, and Kiecolt 1997). Along these lines, but also taking into account employment patterns, Wilson (1987) suggested that that low sex ratios among poor Blacks contributed to high rates of 'out-of-wedlock' childbearing; low marriage rates; and low levels of male parental investment. As at 2002 it was estimated that (taking into account the prison population) there were 26 percent more Black women than men in the community in the United States (Muwakkil 2005). In an article discussing the effect of the increasing shortage of Black men, but particularly well-educated men relative to women, Muwakkil notes:

However, as black women advance, black men are falling even further behind. In fact, the more successful a black woman becomes, the more likely she will end up alone, Walter Farrell, a University of North Carolina professor, said in a March 2002 *Washington Monthly* article. As a result, professional black women are having fewer children, meaning that a growing percentage of black children are being born into less educated, less affluent families.

Also in the United States, Angrist (2001) has produced a working paper entitled “how do sex ratios affect marriage and labor markets”. Angrist argues that, in theory, an increase in the number of men relative to women may increase female bargaining power in the marriage market, shifting resources and family structures in a way that favours women. He goes on to suggest that because sex ratios affect the likelihood of marriage, they may also affect activities that complement or substitute for economic dependence on a spouse. As an example, he notes that women who expect to marry need to worry less about developing an independent means of support. Similarly, he suggests that men who face a more competitive marriage market need to invest in characteristics potentially attractive to mates. Drawing on Becker’s (1981) theories of marriage, Angrist notes that, overall, female labour supply should decrease and male labour supply increase when there is a surplus of men, but female employment should rise when there is a surplus of women.

In his own study, Angrist demonstrates that a surplus of men was associated with several outcomes. These were higher marriage rates for both men and women; lower female labour force participation; and higher spouse and couple income. The results for men were consistent with the view that a deficit of women causes men to marry sooner and to try to become more attractive to potential mates. Angrist also found that children born to parents who married in an environment where there were more men than women were better off in terms of a range of developmental outcomes.

In a more recent study, Mincy, Grossbard and Huang (2005), using United States data from the Fragile Families project, found that the higher the sex ratio in the city of residence (the number of men relative to women), the more it is likely that women are married. In addition, based around the idea that informal polygamy was operating in some US communities, and considering father involvement with their children, the researchers also found that fathers with more children from other women were less likely to have contact with the mother of their last child.

Some of the studies focus on absolute numbers, but others centre more on ratios of employed men to women. This is based on the idea that women are generally seeking economically viable partners. Some take into account race or ethnicity, based on the notion that couples often have partners from within the same ethnic group. Equally, ratios by highest level of education have been used in New Zealand as an indirect indicator of whether there is a shortage of economically viable men (Callister 1998).

Sex ratios, the marriage market, and early fertility

Barber (2000) explored the relationship between sex ratios (specifically a shortage of men in teenage years) and teen pregnancy rates in a variety of countries. His hypothesis was that a low ratio of men to women both destabilizes marriages and makes it more likely that young women will reproduce early outside of marriage. This was based on a replication of an earlier study using sex ratios for 0-14 year-olds (as a proxy for teen sex ratios) and a larger sample of 185 countries. Barber found some support for his hypothesis that a shortage of men encouraged teen pregnancy, with the sex ratio explaining 38 percent of the variance in teen birth rates. This led him to conclude that early childbearing can be seen as an adaptive response to poor marital opportunity.

Other influences on the marriage market

There are, however, many factors influencing couple formation. In a history of love, sex and marriage, Murstein (1974) downplays the role of love and lust in family formation. He argues that these emotions have only recently influenced decisions. In relation to the couple formation in traditional societies, he focuses on issues such as bride exchange, bride purchase and dowries. Couple formation was primarily an economic transaction. The economic considerations were seen as being particularly important amongst those people with significant power or assets, although in this group business arrangements and love could co-exist.

In a modern society, Weiss (1997: 82-83) argues that the production and rearing of children is still seen as one of the key roles of family. However, other economic reasons for couple formation might be:

- Division of labor to exploit comparative advantage or increasing returns. For instance, one partner works at home and the other works in the market.
- Extending credit and coordination of investment activities. For example, one partner works when the other is in school.
- Sharing of collective (nonrival) goods. For instance, both partners enjoy the same child and share the same home or the same information.
- Risk pooling. For example, one partner works while the other is sick or unemployed.

Weiss contends that as unpaid work becomes 'professionalised', the need to form couples or other co-operating multi-adult households lessens. For example, medical insurance or unemployment insurance reduces the need for families to form. In addition, he notes that sex can be purchased in the marketplace, and increasingly even children can be 'bought' in the marketplace through surrogacy and new medical technologies.

Lichter *et al* (1992) suggest that education and the earning potential associated with it allows women to search longer for a suitable partner. Employment not only subsidises the marital search process, but it potentially reduces the economic rationale for marriage. Well-educated women are particularly likely to seek a higher "reservation quality partner" (p. 784), that is, to set higher standards for partner selection. Thus even in the face of a shortage of men, standards of selection may be higher further reducing partner choice. If the "best and brightest" men leave New Zealand in greater numbers than women, and women are becoming better educated than men, then maintaining high standards is likely to result in a decline in partnering for women. Or, women may lower their expectations and start to 'marry down' educationally.

Reliable contraception can also impact on couple formation. For example, Akerlof (1998:288) describes the relatively common "shotgun" marriages of young people in the 1960s. He notes that this often meant that "immature men married equally immature women, both ill prepared for life and each other." With divorce also more difficult in this period, many men and women spent little time as single people.

Effective contraception has been a key factor in a significant decline in fertility in all industrialised countries in recent decades. This means that most women can expect to spend considerably more time in the labour market than in childbearing/rearing. A

longer life accentuates this with childrearing often representing a relatively short period in a person's life. This, in turn, encourages women to invest more in skill development.

While rational economic factors may guide decisions about family formation and structure, sociologists and anthropologists have long argued that norms are also important in shaping behaviour (e.g. England and Farkas 1986). Non-governmental institutions, such as the church, have often promoted these norms. But in most societies, including New Zealand, the population is becoming more secular.

Also featuring in literature on family formation and structure is the role of government policy. Laws regarding marriage and divorce, including issues of rights to property and whether same-sex couples can legally marry, affect the "marriage market". Although, the literature is very contested in this area, the welfare and tax systems may also have an impact on family formation and structure. Other government policies can influence family type structures; for example, justice policies, such as the use of imprisonment. However, the government will generally not be leading social changes, but reacting, often quite slowly, to changes in social "norms" that are already occurring

For all the reasons discussed, declines can be observed in the proportion of prime aged men and women living as couples in most countries. This even applies to Asia where there was near-universal marriage in the past (Jones 2005). Uneven sex ratios are likely to be just one reason behind an increasing number of individual not entering or staying in long-term, couple relationships.

Finally, part of the sex ratio imbalance in New Zealand may actually be due to one aspect of the workings of the New Zealand marriage market. Some New Zealand men may be seeking overseas partners from countries such as the Philippines. If they bring in partners in large enough numbers this could have an influence on sex ratios. There could be many reasons for men seeking partners from overseas. But one might be that these men are seeking wives with more traditional values, who are more willing to specialise in undertaking unpaid work in the home. This theory is supported by some United States research. For example, one of the reasons put forward as to why Chinese women are far more likely to have a White partner is that Asian women are associated with an acceptance of traditional power relationships in a marriage (Qian 1997, Sung 1990).

Conclusion

Overall, with regards to situations where there is an excess of women, the theory, as well as some of the evidence, suggests:

- If there is an increase in the number of women relative to men, then more women will be single.
- When there are more educated women than educated men, for those women forming couples, a greater proportion will 'marry down' in relation to their partners education and/or employment prospects.
- While any decline in couple formation is likely to result in an overall reduction in fertility, a greater number of women may have children on their

own.⁴ In New Zealand, women raising children on their own are far less likely than partnered women to be employed.

- However, having children on one's own will also depend on changes taking place in education for women and their prospects for supporting a family on their own, as well as the support given to sole parents by the state
- An excess of women, especially of well-educated women, relative to men will also lead to higher employment rates for women as well as more women working in managerial/professional occupations.
- An excess of women may lessen the incentives for men to invest in education and in their careers.
- A group of men, particularly those with low skill levels, may not form permanent relationships and may have children with more than one woman.

Finally, as well as changing sex ratios potentially altering marriage markets, the literature suggests that there is some potential for changing marriage markets themselves to have some minor influence on sex ratios. For example, New Zealand men marrying Asian or Russian brides may, in a small way, increase the number of women relative to men in New Zealand. Some of these ideas are tested using New Zealand census data in Callister, Bedford and Didham (2006).

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⁴ The ability for women to have children on their own depends on a range of factors including income support available from the state, childcare availability for those who wish to be employed and even the availability of sperm donors.

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