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UNITED STATES AND AUSTRALIAN FERTILITY:
PAST, PRESENT AND FUTURE
Stephen K. Happel
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PAST, PRESENT AND FUTURE

Stephen K. Hoppel*

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SUMMARY

Given the acknowledged impact that fertility rates have on household spending patterns, labour force composition and participation rates, investment behaviour and the demand for various goods and services, it is surprising that Australian economists have shown little interest in demographic patterns. This is in contrast to the US where in the past twenty years economists have shown a strong interest in studying the impact of demographic changes, particularly in the area of fertility rates.

This paper provides a comparison of Australian and US fertility rates, which shares basic similarities, for the period 1920 to the present and provides both empirical and theoretical evidence for consideration of possible future trends in both countries. Different theoretical reasonings for swings in fertility rates are presented together with historical data from both countries to support these arguments. Both demographic transition theory (which associates changing fertility with changing cultural norms) and the macroeconomic approach of Becker et al. support arguments for no further "baby booms". However, the Easterlin macroeconomic and "marriage squeeze" theories which explain fertility as a function of active monetary and fiscal policies, the size of birth cohorts, and sex ratios, would suggest a substantial rise in births during the 1980's, with alternating swings every twenty years.

Basic demographic and economic variables for the two countries are compared together with several long-run empirical studies from both countries. Economic and social changes since 1960 are discussed and considered in the light of future trends. Economic variables such as per capita income and unemployment have differential impacts across time and ages. If there is an increase in fertility in Australia and the US, it will be because of changes in the timing and spacing of children, not because of an increase in numbers of children per family. The possibility of such an increase is open to dispute but cannot be readily dismissed.

* Summary prepared by the Centre for Economic Policy Research.
INTRODUCTION

Unlike the first half of the twentieth century, the past two decades have witnessed a strong interest in demographic phenomenon by American economists, most notably in the study of fertility. Economic models of childbearing developed by Gary Becker, Richard Easterlin, and others have opened new avenues of research and have contributed to the sharp debate about the future direction of U.S. birth rates.

In contrast, Australian economists seem little concerned with such issues. This is surprising given the basic similarity between U.S. and Australian rates along with the acknowledged impact that fertility has on household spending patterns, labour force participation rates and composition, investment behavior, and the demand for various public goods and services. It is perhaps best explained by the belief that the American experience is somehow different from Australia's and that, in particular, Australian birth rates will remain low and stable for years to come. The purpose of this paper is to consider Australian fertility relative to American fertility to see just how much past experiences have differed and to draw some conclusions about the future.
In section I U.S. and Australian fertility series are compared annually from the 1920's and alternative theoretical explanations for the observed patterns are discussed. In section II economic and socio-demographic statistics and empirical tests are presented for both countries. In section III the likely directions for U.S. and Australian rates over the remainder of the century are debated. The paper then concludes with a summary and overview.
FERTILITY COMPARISON AND ALTERNATIVE THEORIES

Figure 1 depicts the period total fertility rates (TFR) for the U.S. and Australia from 1921 to 1980. The TFR in a given year is the sum of that year's age-specific birth rates 15-49. It is a synthetic measure of the completed number of births per woman, indicating the number of children a female would have if she began childbearing at 15, lived until at least 50, and was subject to the age-specific fertility patterns of the given year over her entire reproductive cycle. Unlike the crude birth rate, the TFR is not influenced by the prevailing age structure of the population. However, as emphasised at several points later in the paper, the TFR is susceptible to shifts in the timing and spacing of births which, in turn, are sensitive to marriage patterns.

1 The U.S. government began publishing annual fertility statistics in 1917, whereas the Brown and Hall (1979 and updates) series used for Australia begins in 1921. After 1980, the U.S. government changed the age range for the fertility series to be compared, thereby causing a break in the data. Data sources for the U.S. are Heuser (1976) and U.S. National Center Health Statistics (various years).

2 The age-specific birth rate in a given year for an age range, for example 15-19, is the (number of births to females aged 15-19 that year divided by the number of females 15-19) x 1,000.

3 The crude birth rate is the (total number of births in a given year divided by the midyear population) x 1,000. It is "crude" in that the denominator includes men, children, and the elderly in addition to the population "at risk", namely women in the childbearing ages.
As seen in Figure 1, the TFR's in the U.S. and Australia are remarkably similar from 1921 through the late 1940's. Both rates fall sharply during the 1920's, well before the onset of the Great Depression. Then after reaching troughs in the 1930's (Australia in 1934 and the U.S. in 1936), both series swing strongly upward in the early 1940's and are practically identical throughout the decade except for the dip in the U.S. rate in 1945.

Starting in 1951 the series diverge somewhat. While both increase in response to the post-war marriage boom and baby boom, climbing to values well above those in the early 1920's, the U.S. series rises more steeply and remains above the Australian series until 1961. In addition, the peak in the U.S. occurs in 1957, whereas the peak in Australia occurs four years later.

After 1961, both countries experience declining fertility rates, but the Australian rate does not fall as sharply as the American rate in the 1960's and actually levels off during the second half of the decade. In 1972 the U.S. TFR falls below the

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4 The similarity is also found in the crude birth rates, as noted some time ago by Coale and Zelnik (1963). Using their own estimates of white crude birth rates in the U.S. prior to the 1940's, they show the U.S. and Australian rates move in close connection with each other between 1890 and 1917 and refer to the similarity as "startling" in the interwar period.
replacement value of 2.1, and it remains below this value over the rest of the decade, whereas below replacement fertility occurs in Australia in 1976. Finally, in 1980, through the combination of a slightly rising U.S. rate and continually declining Australian rate, the two series become convergent once again.

If present fertility patterns in the U.S. and Australia continue, and if large increases in the immigration of young adults do not occur, then both countries will experience a much older age structure and growing numbers of elderly citizens in years to come. This, in turn, will have a major effect on the ratio of the working age population relative to the retirement population and the ability of government support programs for the elderly to survive in present form. It will also affect the composition of gross national (domestic) product and require new investment strategies. Further, it will affect the tax base of local communities because of differences in income levels between retirees and the non-retired population. Thus it is no wonder

5 For replacement, each woman on average must have a boy and girl to replace herself and her spouse, with the .1 an adjustment for mortality.

6 The U.S. TFR’s in 1981 and 1982, derived from age-specific birth rates 15-44, were 1.72 and 1.74 respectively (compared to 1.73 in 1980), whereas the Australian TFR’s in 1981 and 1982, still based on age-specific birth rates 15-49, were 1.94 each year (compared to 1.90 in 1980).
that the movements of fertility rates in general and the likelihood of another baby boom in particular have generated such interest among American economists.

A substantial literature now exists on the explanations for the swings in fertility rates during the last sixty years. In the theoretical arguments to follow, the first model presented is the "sociological" theory of demographic transition. This theory completely dominated fertility research prior to the 1960's and is still very much in prominence today. It serves as a valuable lead-in to the theories of Becker, Easterlin, and other economists subsequently discussed.

Demographic Transition Theory

The notion of demographic transition is normally traced to Thompson (1929), who divided the fertility decline in Western countries into three stages: (1) high mortality, high fertility, 

7 One definition of a "baby boom" is that a fundamental change in family size desires takes place throughout society, many couples start having large families (four or more children) and this continues for an extended period of time. Practically no professional demographers or economists expect such a situation to occur in the U.S. or Australia. Instead, the type of "baby boom" being debated in the literature is a situation where the period TFR goes up from its present value to 2.7 or more and stays at the higher level some 7-10 years or more. This would create bulges in the U.S. and Australian population structures at younger ages and give rise to similar problems and adjustments as in the post-war period.
(2) declining mortality with a lagged fertility response, and (3) low mortality, low fertility. Later, demographers such as Notestein and Davis and Blake provided reasons and governing mechanisms for the transition from stage I to stage III.

According to Notestein (1945, 1953), pre-transitional societies with high mortality have high fertility to avoid population decline and extinction. Religious doctrines, moral codes, laws, education, community customs, marriage habits, and family organisations are geared toward the advantages of large families and many children. But as mortality falls and "modernisation" proceeds, the family-based way of life of traditional societies is replaced by individualism marked above all by growing aspirations. In the process the nuclear family emerges, wealth flows in families are reversed from the younger generation to the older generation, and high fertility becomes a burden for both households and society as a whole.

Davis and Blake (1956) argue that in assessing cultural influences on fertility, the process of reproduction has three basic exposure points:

(1) exposure to intercourse (as affected by age of entry into sexual unions, permanent celibacy, amount of the

Caldwell (1976) stresses that this "modernisation" is not necessarily economic but definitely involves social, psychological, and physiological changes. More recently, Caldwell (1980) points to the critical role of mass education in the timing of the transition.
reproductive period spent after or between unions, voluntary and involuntary abstinence, and coital frequency); 

(2) exposure to contraception (as affected by voluntary and involuntary causes of infertility and the usage of contraceptive techniques); and 

(3) gestation and successful parturition (as affected by voluntary and involuntary causes of foetal mortality).

It is through these mechanisms -- the so-called "intermediate variables" -- that cultural influences operate and create high-fertility or low-fertility environments. Demographic transition, therefore, is associated with changing cultural norms that ultimately reduce societal fertility.

Demographers subscribing to demographic transition theory believe that once the transition to small average family sizes has occurred, fertility rates will remain low as long as mortality rates remain low. Rising aspirations, mass education, large numbers of women in the labour force, and "enlightened" attitudes about sex and contraception are viewed as forces too powerful to reverse.

The U.S. and Australia are both acknowledged to have entered their demographic transitions in the last third of the nineteenth century, thus the declining birth rates of the 1920's and 1930's did not surprise social demographers. What did astonish them at first, however, was the post-war 'baby boom'. Its intensity and duration seemed inconsistent with the belief that completed parities would remain low once stage II had been achieved.
An answer to this apparent inconsistency was provided by Ryder (1980). He believes that inept measurement procedures have misled demographers in their study of temporal variations in American (and by implication Australian) fertility rates. Ryder first distinguishes period (yearly) effects from cohort (lifetime) effects in the U.S. fertility series. Then he measures the influence on the TFR of changes in cohort parities relative to patterns from 1917 to 1976. He concludes that the post-war baby boom was primarily a cohort timing and spacing phenomenon which would have occurred even without any change in the completed number of births per woman. In particular, fluctuations in the average age of females at first birth and, to a lesser extent, the length of interbirth intervals were the reasons for the upsurge in the TFR in the 1950’s.

At present Ryder and most other social demographers reject the likelihood of an upcoming baby boom in countries like the U.S. and Australia. While they do not dismiss the possibility of fertility swings in the future, they believe that such swings will take place in a narrow band (the TFR rising to levels only slightly above replacement) and that any increase will be short-lived rather than prolonged.

9 Ruzicka and Choi (1981) show that timing and spacing shifts were also an important element in Australia’s increase in the TFR in the 1950’s and early 1960’s.
The Microeconomic Approach

The microeconomic (Chicago-Columbia) invasion into fertility analysis was led by Gary Becker in 1960. In contrast to social demographic theory, which points strongly to the physical side of reproduction and the constraining effects of social norms (why people do not have choices), the microeconomic approach relies upon neoclassical demand theory (why people have choices to make). Although the microeconomic approach has applications in many different settings, it focuses on developed countries since the contraceptive revolution of the early 1960’s.

The standard (static) model assumes that households exercise perfect fertility control, that all fertility plans are made at the beginning of marriage (by means of perfect foresight), that children are consumer durables, and that children are normal goods. Households decide on the amount of "child services" to purchase relative to other commodities in response to price and income levels, where "child services" are defined as the number

(quantity) of children times the "quality" of children. Price in this context is "full price", i.e. the price of market goods plus the value (opportunity cost) of household members' time that go into the production/consumption of home produced commodities, while income is "full income", i.e. the value of non-wage income derived from asset ownership plus the value of wages earned in the market sector plus the value of household members' time that go into the production/consumption of home produced commodities.

The microeconomic explanation for declining family size and falling birth rates in developed countries since the early 1960's is simply that price effects have outweighed income effects. First, rising full incomes are associated with a greater opportunity cost of female time; and since young children are intensive in female time, the decrease in demand due to rising time costs have offset the positive income effect. Second, while both the quantity and quality of children are "truly" normal goods, quality has the higher income elasticity because of social pressures to spend significantly on children as household income increases, so the "shadow price" of children increases in

In the microeconomic approach, child quality is an expenditure concept and refers to those outlays beyond the basic necessities. Included are such human capital and luxury items as special schooling and lessons, orthodontic work, expensive toys, etc.

Thus "full income" can be thought of as the potential income of the household given the human capital accumulation of its members.
response to the demand for high quality.

Most microeconomic empirical research has used a static model to examine cross-sectional household data. However, recently the theory has been given a dynamic interpretation by Butz and Ward (1979, 1980) and applied to U.S. time series in order to gain insights into future fertility patterns.

Specifically, Butz and Ward examine age-specific birth rates and period total fertility rates from the late 1940's to the mid 1970's. Following the now typical methodology, they introduce male income and female income (hourly earnings) as separate independent variables in their regression equations. Each income variable is weighted by age-specific female employment ratios to take account of different responses between families with and without employed wives. Butz and Ward find that couples, on average, time their births to avoid periods when female wage rates are expected to be high.

Regarding the post-war baby boom, they see this as a response to rising male incomes. They then go on to argue that in the 1960's the long-standing procyclical nature of the U.S. fertility rates was reversed. The reason is because of the large proportion of women either working or on the margin of becoming employed. With such large proportions, good economic times imply an increase in female wages and employment and, therefore, a decrease in fertility. Because Butz and Ward anticipate continued
growth in female labour force participation rates and a fairly robust economy over the next decade, and because their decomposition of current fertility rates into timing and completed fertility components indicate a substantial downward revision in estimated completed fertility lifetime births, they strongly reject the idea of an upcoming baby boom in the U.S.

**The Easterlin Hypothesis**

The major upturn and subsequent downturn in the fertility rates after the 1930's have generated arguments that instead of minor fluctuations and near replacement values over the remainder of the century, sharp swings will continue for years to come. The best-known and most controversial of these arguments is the Easterlin macroeconomic hypothesis of self-perpetuating fertility cycles.

According to the hypothesis, since the 1940's the childbearing responses of young adults in industrialised countries like the U.S. and Australia have become primarily a function of the size of their birth cohorts (the number of births in their year of birth). The use of active monetary/fiscal policy, combined with restrictive immigration quotas, is the

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reason. The relative prosperity of young adults entering labour markets in such a setting is determined largely by the numbers surviving from birth. In the case of small birth cohorts (like those of the 1920’s and 1930’s), competition for jobs is low, so their relative incomes (actual incomes relative to teenage expectations) are high, and thus they speed up childbearing and have larger families. On the other hand, for large birth cohorts (like those of the post-war baby boom), competition for jobs is high, so their relative incomes are low, and thus they postpone childbearing and have smaller families.

The upshot is that in such a setting fertility swings keep repeating themselves, being some 20-25 years between peak and trough. And because the young adults of the 1980’s and 1990’s

14 Samuelson (1976) presents a non-linear model proving the possibility of a stable-limit Easterlin cycle. In his model there are two age groups: those in the prime childbearing stage of life and those some 20-25 years older who are nearing the end of the reproductive period. The age-specific fertility rate of the younger age group is assumed to be an inverse function of the ratio of the younger population to the older population, which in turn is based on past fertility rates. The resulting dynamic system, once initial numbers are prescribed for the two age groups, forever after determines its own development. As in standard (Lotka) linear stable population models, there exists an asymptotic exponential rate of increase with a stable age distribution. However, there are oscillations around the stable age distribution of an every-other generation type that are additional to those incurred as a standard stable population model irons out abnormalities in its initial age distribution. Samuelson argues that, while it is reasonable to suspect a dampening in the every-other generation Easterlin component over time, a stable-limit cycle can occur if the Easterlin relative income effect is strong.

14
in the U.S. and Australia are from the small birth cohorts of the
1960's, Easterlin anticipates an upsurge in their fertility. Not
only is this at odds with the view of most social demographers
and the Butz-Ward hypothesis, it has angered feminists because
Easterlin believes that in the process many young women will
return to more "traditional" roles.

Easterlin and Condran (1976) compare the total fertility
rate annually from 1940 to 1970 to the relative number of young
adult males (the ratio of males 25-64 to males 15-34) for the
U.A., Australia, Canada, and England and Wales; and they find
that the two series move together closely, especially the U.S.
and Australia. Projecting the series of the relative number of
young adult males forward to 1985 leads to the expectation that
the TFR's in these countries will reach a trough in the early
1980's and then turn upward. More recently, Ahlburg (1983) has
estimated a total live birth equation for the U.S. from 1949 to
1978 with the ratio of births twenty years ago to births forty
years ago as the independent variables. He finds that his
estimated equation tracks the U.S. time series of live births
from 1949 to 1978 very closely; and when the equation is
projected to the year 2070, it predicts a substantial rise in
births (and fertility rates) during the 1980's and alternating
peaks and troughs every twenty years.
The Marriage Squeeze Hypothesis

Another fertility explanation having a "demographic deterministic" component, but one that is based upon the microeconomic theory of marriage and divorce rather than macroeconomic arguments, is the marriage squeeze hypothesis. A marriage squeeze, for example for females, means that there are a large number of females relative to eligible males in marriage markets, and marriage squeezes occur because: (1) men and women marry on average at different ages, and (2) the number of births fluctuates from year to year.

According to Heer and Grossbard-Shechtman (1981), such squeezes affect fertility outcomes through the selection of a spouse and through the concern over the possibility of divorce. In particular, the more intense the female marriage squeeze, the smaller will be the proportion of women able to choose husbands with: (1) a high monetary income, (2) a high inclination toward having children, and (3) a high productivity in childbearing tasks. Also, the more fearful wives will be that they will be abandoned by their husbands and forced to raise children alone. The net result is fewer births per woman and declining fertility rates.

The seminal microeconomic articles on marriage and divorce are Becker (1973, 1974) and Becker, Landes, and Michael (1977).
Heer and Grossbard-Shectman look at two measures of marriage squeezes in the U.S. between 1955 and 1977: the ratio of the total number of males aged 19.5 to 26.5 to the total number of females aged 17 to 24, and the ratio of the number of unmarried males aged 20 to 29 to the number of unmarried females 18 to 29. Both ratios show a male marriage squeeze in the mid-1950's in response to the decline in the absolute number of births each year during the late 1920's and early 1940's and the fact that men tended to marry women about two to three years younger than themselves. Because more men were born in 1930 than women born in 1932 or 1933, men born in 1930 had a more difficult time finding a spouse than women born in 1932 or 1933.

The ratio on total numbers dropped below unity in 1957, whereas the ratio on unmarrieds did so in 1965, and both remained below unity through 1977. The female marriage squeeze during these years was due to the continuing difference in marriage ages coupled with the increases in the number of births from the 1940's through the late 1950's. Heer and Grossbard-Shectman argue that this female marriage squeeze, combined with the improvements in birth-control methods that increased the utility for women of sexual relationships without procreative interest

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16 These particular age groups were chosen because the midpoints are very close to the median ages at first marriage of males and females respectively and the fact that a high proportion of all men and women marry within the 7-year period surrounding the median age at first marriage for their sex. Median ages of marriage are examined in more detail in the next section.
relative to the utility of a relationship with procreative intent, altered traditional male-female compensation patterns and contributed significantly to the declining fertility rates.

Projecting the ratio on total numbers through 1984 and finding it greater than unity after 1980, they anticipate a male marriage squeeze for the remainder of the century. While they believe that the contraceptive revolution makes it unlikely that the proportion of cohabiting couples who intentionally choose to have children will ever again be a high as in 1960 or that there will be a full return to values prevalent in the 1950’s, Heer and Grossbard-Shechtman believe that the U.S. will see some return to a higher evaluation of the traditional female role. They have sympathy for the Easterlin hypothesis and expect young males in the 1980’s and 1990’s to enjoy relatively favorable economic opportunities, but face relatively unfavorable chances for marriage. And the return to the more traditional female role implies an upsurge in fertility.

In contrast to the descriptive approach of Heer and Grossbard-Shechtman, Carter (1979) examines the influence of marriage patterns on U.S. fertility through regression of techniques. Building upon the work of Butz and Hard (in which male income and female earnings representing income and price effects respectively are weighted by the proportion of women employed in the labour market) Carter looks at the age-parity
specific fertility rates for women 20-24 between 1948 and 1974. He first does regressions on the proportion of women aged 20-24 who are married, including the ratio of single men 20-34 to single women 20-24 as an independent variable, and he finds that the ratio is statistically significant and its sign corresponds to marriage squeeze arguments. Carter then has the proportion of women 20-24 who are married along with male income and female earnings in his regressions on age-parity specific fertility rates for parities one, two, three, and four, and in each case this variable is statistically significant and has the anticipated positive sign.

Happel and Penn (1985) take a more direct approach than either Carter or Heer and Grossbard-Shectman. They test for "overall causality", i.e. the presence of Granger-causality and instantaneous causal relations, between U.S. and Australian sex ratios and age-specific fertility rates from 1921 to 1980 using a bivariate autoregressive model. The ratio of females aged 20-24 to males aged 20-29 is run against the age-specific fertility rate 20-24 and against the age-specific fertility rate 25-29, and the ratio of females 25-29 to males 25-34 is run against the age-specific fertility rate 25-29.

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17 Age-parity specific fertility rates are a refinement on age-specific fertility rates in that they relate to the order of birth (1st, 2nd, 3rd, etc.) as well as to the age of the female.

18 The male age groups 20-24, 25-29 and 30-34 are weighted by the proportions in which they are married to single women aged 20-24.
As seen in Figure 2, the 20-24 ratios and the 25-29 ratios (with a five-year lag) fluctuate considerably from 1921 to 1980. Male marriage squeezes are readily apparent in the late 1940's in both countries, with the plunge in the Australian ratios due to the sharp increase in young adult male immigration in the 1950's. On the other hand, female marriage squeezes are apparent in the 1960's and 1970's. Happend and Penn find that there is definitely causation from the 20-24/20-29 ratio to the 20-24 and 25-29 age-specific fertility rates in both countries, but that the results are more ambiguous for the 25-29/25-24 ratio and the 25-29 age-specific fertility rate. Projecting the 20-24/20-29 ratios onto to 1995 (Figure 2), they anticipate a male marriage squeeze like Heer and Grossbard-Schechtman do, and, therefore, expect rising fertility rates for young adults in the second half of the 1980's.
FIGURE 2: FEMALE-MALE RATIOS IN THE U.S. AND AUSTRALIA.

1921 TO 1995

| F20-24 TO M20-29 - AUSTRALIA |
| F25-29 TO M25-34 - AUSTRALIA |
| F20-24 TO M20-29 - U.S. |
| F25-29 TO M25-34 - U.S. |

YEARS


FEMALE - MALE RATIOS

41,000 43,000 45,000 47,000 50,000 53,000 55,000 57,000

F20-24 / M20-29 US

F25-29 / M25-34 US

F20-24 / M20-29 AUS

F25-29 / M25-34 AUS

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FURTHER COMPARISONS AND EMPIRICAL EVIDENCE

Attention is now directed toward further comparisons of demographic, economic, and social measures in the U.S. and Australia to gain greater insights into past and future fertility patterns. The discussion begins by examining basic demographic measures of age structure and marriage, then basic economic measures of income, employment, and education, for the entire period. Next, three long-run empirical studies of fertility rates and demographic and economic variables are reviewed. Finally, critical economic and social changes since 1960 are addressed.

Demographic Indicators

Table 1 presents four measures of age structure for the U.S. and Australia since 1920: the ratio of women 15-49 to the entire female population, the ratio of women 15-49 to the total population, the ratio of women in the prime childbearing ages 20-34 to the female population, and the ratio of women 20-34 to the total population. While the total fertility rate in any given year is definitionally free of age structure effects, from a functional point of view differences in female age structures can

19 Education is considered an economic variable in view of microeconomic arguments about its close association with the opportunity cost of time (the full price of children).
<table>
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<tr>
<th>Year</th>
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<th>$\frac{F_{15-49}}{\text{Total Population}}$ U.S. Australia</th>
<th>$\frac{F_{20-34}}{\text{Total F Population}}$ U.S. Australia</th>
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<td>.503</td>
<td>.258</td>
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Parentheses indicate census years for Australia.

Sources: U.S. Department of Commerce, Statistical Abstracts of the U.S. (various years), and Brown and Hall (1979 and updates).
lead to substantially different TFR's because of variations in the proportions of women married and the timing of births.

The percentages for all four measures are nearly the same for the U.S. and Australia at the ten-year intervals, suggesting that age structure is a prime element contributing to the general similarity in the TFR's. In line with marriage squeeze arguments, the ratios increased from 1920 to 1930 and 1930 to 1940, decreased from 1940 to 1950 and 1950 to 1960, and then increased from 1960 to 1970 and 1970 to 1980.

Turning to marriage patterns, Figure 3 depicts the median age at first marriage for U.S. and Australian males and females since the 1920's. As pointed out previously, there is a 2-3 year gap between the median ages of marriage for males and females in both countries, with Australian males and females on average marrying later than American males and females.

The four series start to decline sharply in the early 1940's. But, while the U.S. series bottom out in the mid 1950's and have an upward trend in the 1960's, the Australian series  

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20 The U.S. figures, which are only available at ten-year intervals before 1940, are from the U.S. Bureau of the Census (1972 and updates), while the Australian figures are from Carmichael (1984). Different computational techniques mean that the Australian series are "smoother" than the U.S. series.
Figure 3: U.S. and Australia, median age at first marriage by sex, 1921 to 1980.
continue to decline through the 1960’s. These differences are obviously tied to the peak in the Australian TFR coming later than the peak in the U.S. All four series dip noticeably in the early 1970’s, followed by sharp upturns over the remainder of the decade.

Although marriage squeezes in the young adult age groups have impacts on these measures, the median ages are calculated for the entire population rather than specific age groups. Changing economic conditions and social norms are the most significant factors affecting the measures.

Table 2 provides a more detailed breakdown of marriage patterns in the two counties, by presenting the percent of males and females ever-married by selected ages. Much higher percentages of women than men are ever-married in each country by ages 20 and 25, and the date pattern of marriage in Australia relative to the U.S. is readily seen in terms of the percentages of ever-married males and females by ages 20 and 25. The figures are much more alike for both sexes and across both countries at ages 30-34. This, in turn, reflects the almost universal desire by Americans and Australian to marry.

The fact that Australian males and females on average marry at later ages than their American counterparts is reflected in the values of the age-specific birth rates depicted in Figures 4
| Census Year | UNITED STATES | | Census Year | AUSTRALIA | |
|-------------|---------------|---|---------------|-----------|
|              | Age | Males | Females |              | Age | Males | Females |
| 1930         | 20  | 12    | 39.5    | 1933<sup>*</sup> | 20-24 | 13.5 | 31.5    |
|              | 25  | 53    | 72      |              | 25-29 | 44.5 | 73       |
|              | 30-34 | 79   | 87      |              | 30-34 | 67.5 | 84.5     |
| 1940         | 20  | 11    | 37      | 1947        | 20    | 7    | 27.5     |
|              | 25  | 53    | 71      |              | 25    | 53   | 73       |
|              | 30-34 | 79   | 85      |              | 30-34 | 78   | 86       |
| 1950         | 20  | 18    | 50      | 1954        | 20    | 7    | 35       |
|              | 25  | 68    | 83      |              | 25    | 52.5 | 80       |
|              | 30-34 | 87   | 91      |              | 30-34 | 80.5 | 90.5     |
| 1960         | 20  | 24    | 54      | 1961        | 20    | 8    | 35.5     |
|              | 25  | 72    | 87      |              | 25    | 56   | 84       |
|              | 30-34 | 88   | 93      |              | 30-34 | 86   | 92       |
| 1970         | 20  | 22    | 43      | 1971        | 20    | 12.5 | 40.5     |
|              | 25  | 73    | 84      |              | 25    | 65   | 85       |
|              | 30-34 | 89   | 92.5    |              | 30-34 | 86   | 93.5     |
| 1980<sup>*</sup> | 20-24 | 31.5 | 50      | 1981<sup>*</sup> | 20-24 | 22.5 | 45.5     |
|              | 25-29 | 67.5 | 79      |              | 25-29 | 65   | 81       |
|              | 30-34 | 84   | 90.5    |              | 30-34 | 84.5 | 91.5     |

<sup>*</sup> Only five-year intervals are available from ages 20 to 30.

**Sources:** U.S. Department of Commerce, Census of the United States (various years) and Australian census data (various years).
Figure 4: Age-Specific Birth Rates, for the U.S.

1940 to 1980

Birth Rate per Thousand Female Population

Years: 1940 to 1980

Age Groups:
- 15-19
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
FIGURE 5: AGE-SPECIFIC BIRTH RATES FOR AUSTRALIA,
1940 TO 1980

- 15-19
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44

BIRTH RATE PER THOUSAND FEMALE POPULATION

0 40 80 120 160 200 240
For the U.S., the age-specific birth rates with the greatest value each year is the 20-24 rate, whereas for Australia it is the 25-29 rate, except during the height of the post-war baby boom. This delayed pattern is also seen in the over-30 rates which are higher in Australia than in the U.S.

Economic Indicators

Table 3 presents comparisons on real per capita incomes for the U.S. and Australia since the 1920's. The startling feature is how disparate the percentage changes in the incomes of the two countries were prior to 1950 — a period when the TFR series were nearly identical. From its value in 1921 to its value in 1929, U.S. per capita income actually decreased. Then from 1930 to 1939 the Australian level of income increased by the greater percentage, only to see the situation reversed again from 1940 to 1949.

Between 1950 and 1959 and 1960 and 1969, the percentage increases in both countries were practically the same. However, the period from 1970 to 1979 once again saw the U.S. growing faster than Australia. For the entire 1921 to 1979 period, the increase was 200 percent in the U.S. and 150 percent in Australia.

The 45-49 age-specific birth rates are not shown because of extremely low values.
<table>
<thead>
<tr>
<th>Decade</th>
<th>U.S.</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1921-1929</td>
<td>42%</td>
<td>-3%</td>
</tr>
<tr>
<td>1930-1939</td>
<td>7%</td>
<td>24%</td>
</tr>
<tr>
<td>1940-1949</td>
<td>26%</td>
<td>18%</td>
</tr>
<tr>
<td>1950-1959</td>
<td>15%</td>
<td>16%</td>
</tr>
<tr>
<td>1960-1969</td>
<td>33%</td>
<td>32%</td>
</tr>
<tr>
<td>1970-1979</td>
<td>22%</td>
<td>15%</td>
</tr>
</tbody>
</table>

* Per capita GNP in 1958 dollars
** Per capita GDP in 1966/67 dollars

The differences in per capita income growth rates relative to the similarities in the fertility rates reinforces contemporary economic reasoning that current income, particularly when no distinction is drawn between male and female earnings, will yield ambiguous results. Both the microeconomic and Easterlin frameworks are based on more refined concepts of income, and the microeconomic approach emphasizes marked differences in household fertility from an increase in male earnings as opposed to an increase in female earnings.

Table 4 presents total unemployment rates for the U.S. and Australia every other year from 1920 to 1980. Because of different reporting and measurement procedures, detailed comparisons are inappropriate. Nevertheless, broad patterns can be discerned, and it is clear that, like per capita income, there are differences in the two countries, most notably in the 1920's and 1950's. Again, contemporary economic theory anticipates ambiguous results using total figures and stresses the need for male-female distinctions, preferably by age and marital status. Such distinctions are only available in Australia after 1960, and comparisons with the U.S. are discussed subsequently in the section on economic and social changes since 1960.

As for education, Caldwell (1960) points to the strong similarities in the U.S. and Australia from the last third of the nineteenth century to 1950. Legislation compelling parents to send all children to school for at least elementary education was enacted in the majority of U.S. states and Australia by 1880.
### TABLE 4: TOTAL UNEMPLOYMENT RATES FOR THE UNITED STATES AND AUSTRALIA, EVEN-NUMBERED YEARS, 1920 TO 1980

<table>
<thead>
<tr>
<th>Year</th>
<th>U.S.</th>
<th>Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1920</td>
<td>4.0</td>
<td>9.3</td>
</tr>
<tr>
<td>1922</td>
<td>7.6</td>
<td>6.9</td>
</tr>
<tr>
<td>1924</td>
<td>5.5</td>
<td>6.7</td>
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<tr>
<td>1926</td>
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<td>7.3</td>
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<tr>
<td>1930</td>
<td>8.9</td>
<td>20.5</td>
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<td>1932</td>
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<td>20.2</td>
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<td>1934</td>
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<td>1948</td>
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</tr>
<tr>
<td>1980</td>
<td>7.1</td>
<td>5.9</td>
</tr>
</tbody>
</table>

**Sources:** For the U.S., from 1921 to 1948 Lebergott (1957) and from 1949 to 1980, U.S. Department of Labor (1982); for Australia from 1920 to 1948 Keating (1973) and from 1949 to 1980 Reserve Bank of Australia (1984).
Among children enrolled in school in the U.S., the proportion attending daily was 35 percent in 1870, 41 percent in 1890, 53 percent in 1910, 68 percent in 1930, and 75 percent in 1950; and the values are quite similar for Australia.

However, it is also apparent that at least in recent decades Australians stop going to school on average at younger ages than Americans. For example, for Australia in 1971 (the first year figures on full-time and part-time students by age and sex are available), 63 percent of males and 46 percent of females 15-19 were at school, whereas for 20-24 males and females the values were 20 percent and 7 percent respectively. In contrast, for the U.S. in 1970, the values were 83 percent and 77 percent respectively for males and females 14-19, and they were 28 percent and 15 percent respectively for males and females 20-24. The disparities were even more pronounced at the beginning of the 1980's.


Long-Run Empirical Studies

Empirical studies on refined (as opposed to crude) measures of fertility from around World War I through the 1960's are few. Recently Kelly and Cutright (1984) have looked at economic and other determinants of annual fluctuations in U.S. fertility from 1917 to 1976. Their dependent variables are white, parity specific fertility rates (with the effect of age removed) for parities one through five. The independent variables in their OLS regressions (lagged one year) include: the marriage rate of women aged 15 and older, the total unemployment rate, contraceptive usage, and Easterlin's (1973) relative income. Both fully dynamic (i.e., estimating the effects of the annual changes in the independent variables on annual changes in fertility) and partially dynamic (i.e., estimating the effects of the annual levels in the independent variables on annual changes in fertility) models are tested.

The fully dynamic models are judged to be empirically superior. Kelly and Cutright find in such models that the effect of unemployment varies by parity, with little or no statistical significance at the first and second parities, but significance (and a negative sign) for subsequent parities. In contrast, they find significant direct effects of the marriage rate on fertility, but the effects decline sharply with increasing parity. Their results also show that annual change in fertility since around 1960 has been influenced by contraceptive usage, with the impacts stronger at higher parities. Lastly, they
conclude that annual change in relative income status is not an important determinant of annual changes in fertility at any parity.

Basavarajappa (1971) compares correlation coefficients for five demographic and economic series in Australia from 1920 to 1938 and 1946 to 1967. The series include: age-duration of marriage-specific fertility rates (age and duration of marriage both in groups of five years), female age-specific marriage rates, real GDP per capita, total employment, and unemployment as a percentage of the civilian labour force.

For the period 1920 to 1938 he finds the correlations between marriage rates and the economic variables to be very high and he finds similar close associations between fertility rates and the economic variables. On the other hand, for the period 1964 to 1967 he finds a lack of significant relationships between marriage rates and the economic variables and between fertility rates and the economic variables. In addition, real GDP per capita and total employment now have, for the most part, negative impacts on the fertility rates whereas in the earlier period they had, for the most part, positive impacts.

Brooks, Sams and Williams (1982) test a simultaneous equation model of fertility, marriage, divorce, and labour force participation for Australian women from 1921 to 1976 as part of the IMPACT Project's Population Projection Facility. In their log
linear regressions on the mean and variance on implied completed 
family size, the independent variables are: the real female 
hourly wage rate, real GDP per capita, the infant mortality rate, 
the oral contraceptive usage rate, and the real old age and 
invalid pension rate, all lagged one year, dummy variables for 
World War II.

In both the mean and variance equations for implied 
completed family size, real GDP per capita has a positive 
influence and is statistically significant, while the old age 
pension rate and the WWII dummy have negative signs and are 
statistically significant. The female hourly wage rate has a 
negative sign in the equations, but is only significant in the 
variance equation. The infant mortality rate and the oral 
contraceptive rate impact negatively on implied completed family 
size, significant in the equations.

Economic and Social Changes Since 1960

The majority of the arguments by economists and social 
demographers who reject the idea of an upcoming baby boom focus 
on major changes since 1960. The discussion begins with similar

24 Implied completed family size is based on cross-sectional 
fertility rates in each year and it is assumed, as with the TFR, 
that these ratios are the age-specific rates facing a woman over 
all her reproductive life. Implied completed family size is 
determined as a set of sequential decisions consisting of the 
decision to have a first birth and then to have higher order 
births.
changes in the U.S. and Australia over the past several decades, then important differences are noted.

Heading the list of changes is the contraceptive revolution. The pill was introduced in the U.S. and Australia at the beginning of the 1960’s, along with safe and effective IUD’s. By 1970, 34 percent of currently-married U.S. women aged 15-44 who were contracepting listed the pill as their present method of contraception, compared to 14 percent for the next most popular method (condoms), and some seven percent were using the IUD as their main method. And according to Ruzicka and Caldwell (1977), by 1970 in Australia the pill was the main method of contraceptive use for almost half of all married couples (two-thirds of the youngest wives), while the IUD climbed in use from the mid-1960’s until the early 1970’s from one to eight percent of all main contraceptive use.

The revolution continued in the 1970’s with the legalisation of abortion in the U.S. and most of Australia and the increased acceptance of sterilisation. Indeed, sterilisation is now the fastest growing form of contraception in the U.S. and Australia.

The contraceptive revolution has affected fertility rates in three immediate ways. First, it has meant a sharp decline in

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25 See Westoff and Ryder (1977) for further details.
unwanted births, particularly at higher parities. Second, as point out previously, it has increased the utility for women of special relationships without procreative intent, thereby reducing the proportion of women engaged in the traditional combination of wifely and maternal services. Lastly, it has meant that young women can enter the labour force and make long-run commitments without much fear of having career paths interrupted at inopportune times. This, in turn, has contributed to the major upswings in labour force participation rates of married women.

Table 5 presents comparisons of labour force participation rates of the U.S. and Australia for all women, married women aged 20 to 24, and married women aged 25 to 34 from the 1960's to 1980. The percentage increase in the rates for all women between 1965 and 1980 was over 30 percent in the U.S. and Australia. But, even more remarkable were the percentage increases in the rates for married women, being over 60 percent in both countries for 20-24 year olds and over 80 percent in both countries for 25-34 year olds.

Finally, in terms of similarities there are the patterns of household composition. Since 1960 both countries have experienced declines in the percentage of married-couple households and an increase in one-parent and single households. Also there has been 26 a sharp increase in unmarried-couple households.

26 See Glick (1984) and McDonald (1984) for further details.
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1960</td>
<td>37.7</td>
<td>-</td>
<td>30.0</td>
<td>-</td>
<td>27.7</td>
<td>-</td>
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<td>1965</td>
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</tr>
<tr>
<td>1970</td>
<td>43.3</td>
<td>40.0</td>
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<td>1975</td>
<td>46.3</td>
<td>43.5</td>
<td>57.1</td>
<td>53.5</td>
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<tr>
<td>1980</td>
<td>51.5</td>
<td>45.0</td>
<td>60.2</td>
<td>56.5</td>
<td>59.3</td>
<td>48.0</td>
</tr>
</tbody>
</table>

As for differences between the two countries, the fact that Australian quit school on average at a lower age has already been pointed out. Also, the heavy immigration of the 1950's continued into the 1960's in Australia, affecting labour and marriage markets and helping to prop up fertility rates. However, the biggest difference was the elimination in Australia during the period 1969 to 1975 of pay discrimination on the basis of sex.

In June 1969, the Federal Wage Tribunal introduced "equal pay for equal work", to be implemented in stages by January 1, 1972. Then in 1972 the Federal Tribunal handed down the decision of "equal pay for work of equal value", to be implemented in three uniform steps over the period to June 1975. The effect was to increase female/male award rates (adult average minimum award rates for a full week's work) from 72 percent in 1969 to 93.3 percent in 1977 and to increase relative female earnings 30 percent (compared to almost no change in the U.S. value over the same period). This was certainly a critical factor in Australia's decline in fertility rates in the 1970's, helping to offset the positive impacts on fertility of immigration and of earlier school departures (resulting in opportunity costs of female time).

27 Although on average immigrants did not have extremely high fertility rates, their rates were greater than for native born Australians in the 1950's and 1960's (Price (1982)).

28 See Gregory and Duncan (1981) for more complete discussions of these two decisions.
SOME CONCLUDING SPECULATIONS ABOUT THE FUTURE

The reasons for the heated debate among American economists about the future direction of fertility rates should now be apparent. There are a myriad of economic, social, and demographic forces operating on childbearing decisions and outcomes, and basic economic variables like per capita income and unemployment have differential impacts across time and across ages and birth orders. Thus, past fluctuations in U.S. and Australian rates are open to very different interpretations as to whether they represent temporary deviations from a long-run (downward) trend or instead represent a type of self-sustaining cycle.

Even with the differences of opinion, some ideas about the future seem clear. If there is to be a notable and prolonged increase in U.S. and Australian total fertility rates before the end of the century, it will be much more a tempo phenomenon rather than a sudden upsurge in four or more child households. As shown in Figures 4 and 5, the age-specific birth rates dropping most sharply from the height of the post-war baby boom to 1960 in the U.S. and Australia were the 20-24 rates; and a shift toward earlier timing patterns and higher values for these rates must occur for the TFR's to rise to "baby boom" levels.

Moreover, an increase in TFR's is only likely to take place with a return to more traditional family values. The rises in the
percentages of single and unmarried-couple households would have to be reversed, divorce would have to become less commonplace, motherhood would have to take on added prestige, and family commitments would have to be more important than "self" or "job" commitments.

Those arguing against such occurrences in the U.S. and Australia certainly make a strong case; the demographic transition seems complete once mortality has stabilised at low levels, effective forms of contraception and abortion-on-demand are readily available, women (especially married women) are working in ever greater numbers with improved job opportunities, and the time costs of raising children are becoming ever more prohibitive in terms of both work and leisure alternatives. Indeed, if female earnings relative to male earnings would increase in the U.S. in the near future as they did in Australia from 1969 to 1977, the Butz and Ward (1979) estimate of -1.792 for the elasticity of the TFR with respect to female earnings implies that further sharp declines rather than a baby boom would be the likely result.

Although I appreciate these arguments, I am still reluctant to rule out an upsurge in U.S. and Australian fertility in the near future. The age-specific birth rates 20-24 (and 25-29) have substantial room to increase, particularly in view of their values only 20-30 years ago. Easterlin's notion of relative income, while elusive to specify precisely, cannot be dismissed as an important determinant in the timing of marriages and
births. The same is true for marriage squeezes. So it seems quite plausible to me that females may be marrying at younger ages. If they do, and especially if they have little premarital work experience or are not faced with high rates of job skill depreciation, a recurrence of earlier tempo patterns is likely. Then the initial upsurge in fertility may be sustained by the availability of inexpensive day care, paid maternity leaves without the loss of seniority, and the belief that children are an important asset for old-age security even with pension and superannuation schemes.

I also think that the possibility of an upsurge in fertility rates and total numbers of births is at least as high in Australia as it is in the U.S. Australians leave school at earlier ages and, therefore, do not have the competing educational demands on family formation to the same extent as young American adults. Also, major adjustment in female wages and earnings relative to male values have already taken place. Perhaps most importantly, given that the areas of Australia and continental U.S. are approximately the same but that the Australian population is less than 10 percent of the U.S. population, there is ample room for growth in Australia even with the desire by most of the population to live in coastal cities.

29 Happel, Hill, and Low (1984) provide formal proofs of these propositions.
SUMMARY AND OVERVIEW

This paper has compared U.S. and Australian fertility to generate greater interest among Australian economists and other social scientists in childbearing decisions and outcomes. Basic economic and demographic indicators were examined in relation to fertility patterns to discern key trends since the 1920's, with special attention directed toward the similarities and differences in the two countries during the past several decades. It was concluded that although the likelihood of low fertility rates over the remainder of the century appears quite high in both countries, the possibility of another baby boom cannot be readily dismissed. Moreover, a case was made that the possibility is at least as great in Australia as in the U.S.

Certainly many in Australia would disagree. But it is time that these issues were debated more intensely among Australian economists and other social scientists. As American economists have come to realise, demographic variables are simply too important to ignore or to treat as exogeneous when examining labour and product markets. Careful, systematic research is called for, with the return being a better understanding of the economy and what the future holds in store.


Census of the Commonwealth of Australia, various years.


------------, "The Empirical Evidence From the Fertility Demand Functions: A Review of the Literature", American Economist 21 (Fall 1977):12-112. (b)

Glick, Paul "American Household Structure in Transition", Family Planning Perspectives, 16 (September/October 1984):203-211.


Happel, S.K. and Penn, Jack, "Changing Sex Ratios among Young Adults and Their Implications for Fertility". Working paper, Department of Economics, RBS, Australian National University, 1989.


