Implications of Some Demographic Parameters for Asian Forest Products Markets until 2050

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Introduction

Typical predictors of consumption trends are population levels and per capita income. Asia contains, as we know, nearly half the consumers of the world, and the growing movement to nearest nation trade creates a market of overwhelming importance to Australia and New Zealand, countries which together have less than half of one per cent of the world's 6 billion people. This paper concentrates on China and Japan, which together with Taiwan Province comprise nearly one-quarter of the world's people, and tries to examine some demographic trends, both those that are well known and those that are not. It focuses on *quantity of life* rather than *quality of life*, although of course *sensu stricto*, quantity is only one of many possible qualities of a set. Quality of life could conveniently be summarized with a single index, such as GDP/capita, but we shall here only speak of quantity of life.

Population scenarios are important to observers of the forestry sector from both the demand and the supply perspective. As this colloquium is concerned with markets, this paper addresses the demand side but it is worth noting that the two influences can converge on the forest itself through the agency of deforestation. This occurs particularly in the Asian tropics, where the effect of large local populations combines with that of large northern temperate populations in rapidly growing economies. Palo & Lehto (2001) have studied the UN data and presented them in terms of absolute, average, and marginal rates, finding that marginal rates of population growth had already begun to fall in tropical Asia in 1970, but in tropical Africa they are only just beginning.

Basic Concepts

Demography has advanced to great analytical sophistication in the three and a half centuries since the Englishman John Graunt wrote his "Natural and Political Observations made upon the Bills of Mortality", but the raw data that Graunt used is still essentially the same. With birth, mortality and fertility rates, ages at marriage (nuptiality) and women's "age at first confinement" (this quaint term was still used in New Zealand until recently), Graunt was able to estimate numbers of men of military age, women of childbearing age, and even made a good guess at the population of London, unfortunately out-dated by the Great Fire and Great Plague four years later. Everyone will be reasonably aware of the published statistics such as age expectancy (always less in males, presumably due to the absence of alleles for the part of the length of the X chromosome in the male – this difference seems to be growing, up to seven years), and others such as infantile mortality both of which spill over into the quality of life as well as the quantity because the former is low in the least developed countries, and the latter high.

Since most of the paper will be concerned with discussing the impact of *low* fertility, it is important at the outset to understand the difference between natural human fecundity and fertility. Since we only have data for historic times, it is hard to

estimate what the average potential childbearing capacity might be but research on an extreme pro-life North American religious group, the Hutterites, suggests it might be 10 per woman. Since recording of population changes has become widespread, the highest known rate of increase was 4.1% per annum, in Kenya in the 1980s (less than 3% p.a. elsewhere in Africa). Fertility is much less, and has long been so, even without deliberate intervention. A complex of physiological reasons, all statistical in their effect, account for this difference. They include variations in the age of menarche and menopause, menstrual cycles without ovulation, non-implantation of ova, miscarriages, stillbirths, and so on. Beyond these factors we meet social customs for appropriate age of marriage and re-marriage, voluntary celibacy and abstinence, and the several forms of limitation ranging in history from infanticide to contraception, all of which may be from choice, or coercive through any means from government regulation to peer pressure.

Throughout the whole world, the total fertility rate (TFR) fell to 2.9 children per woman in the year 2000, with 1.5 for developed countries and 3.7 for developing countries. Many former eastern bloc countries including Russia itself recorded very low TFRs of less than 1.3 (Population Reference Bureau, 2000). We know this generates declining populations, and can even extinguish nations from history.

Japan

The Problem:

We commence with Japan. One need hardly recall the importance of this country as a destination for both New Zealand and Australian forest product exports. For example, in the year ended March 2001, New Zealand's forest products exports to Japan were provisionally valued at A$625 million, 22% of the total, and second only to Australia's 29%. For specific products proportions were higher, for example panel products 55%, the largest customer, and logs 32%, second after the Republic of Korea.

Most of the basic facts of Japanese demographic trends are well known from media report. The media there are inclined to dramatise surprising events as "shocks" i.e. "oiru shokku" (1973), and they concocted the "Ich-ten-go-san shokku" – the revelation that a Japanese woman would on average bear only 1.53 children during her lifetime. Since that time the figure fell to its lowest level – 1.32 in 1999. The total population, now slowing to a maximum figure around 127 million, will start to fall (without immigration) to 118 million in 2030 and 105 million in 2050.

We can see the change in what used to be called the age pyramid, but increasingly looks like the age mushroom. We can see the cohorts of the birth bulge now and those of their children, an "echo" but the number of old persons by 2025 is a phenomenon Japan will reach much earlier than the Western countries. Already 17% now, persons over 65 will constitute 33% of the population by 2050. Very high rates of proceeding to tertiary education occur in Japan, about 49%, and 96% complete full high school, so, adding in estimates for young people not yet in the workforce, perhaps another 14%, it appears the labour force from 21 – 65 will still stay around the 53% it is now, except that the average age of mandatory retirement for 90% of companies is currently 60, not 65. Again, although Japanese women have the highest

life expectancy at birth of any group in the world, at 82.9, women of over ten other countries, including Australia at 81.1, are within 5% of this figure.

Incidentally, the change in the pyramid is primarily influenced, according to demographers, by changes on the fertility rate, not by changes in the mortality rate. However, it is important to note for later arguments that the dramatic fall in mortality rates as infantile mortality and infectious diseases were conquered took place much more swiftly in the fortunate parts of the Third World than in the First World.

The official Japanese Government view of the problem is based on the work of the National Institute of Population and Social Security Research in the Ministry of Health, Labour and Welfare. It is that the low fertility rate is due to the delay of first marriage and an increasing proportion of people never marrying. (One must recall that in Japan, rates of extra-marital births are very low, less than 1%). The official position (which includes a belief that the marital fertility is still positive) has been criticized by Hiroshi Hiroshima and his colleagues at Shimane University. The results of their cohort-specific simulations (Hiroshima, 2001) show that only 70% can be accounted for by nuptiality considerations and the other 30% is due to marital infertility. Iwasawa (2001), still on the Ministry line, argues along sociological and cultural lines that the decline in traditional arranged marriages (miai-kekkon) has only imperfectly been replaced by the Western dating culture, so males especially are unduly passive in finding a partner, careers now look more promising for females than formerly and continued financial support from parents following a pampered childhood renders marriage a potential hardship situation. This paper adopts the position of Hiroshima, whose regressions suggest more deep-seated reasons for infertility. However, a point raised by Iwasawa illustrates the cultural demographic effects – she notes the appearing of a new class of childless non-cohabiting couples in Japan, negligible in Western societies, which further increases the tendency to delay marriage.

Household composition is responding to these changes with household numbers growing faster than the population. Single person households have increased from 18.5% to 23.6% in thirty years and although the percentage of nuclear families has not changed much, its composition has. Married couples without children have doubled to 20.4% of households and the formerly universal three-generation households have fallen by half from 19.2% to 10.6% (Monthly Statistics of Japan, 2001). The latter category is interesting, and stems from the traditional co-habitation of parents with their eldest married son. Since as in most societies the care of the elderly falls on the shoulders of women, and young Japanese women are less willing than their forebears, eldest sons have difficulty in finding brides. Inheritance tax is heavy and the main avoidance strategy is either to live in a run-down house in old age or to gift the home to the next generation and live with them, hoping to survive long enough for avoidance of gift duty too. The aging population increases Government revenue from this source simply by fiscal drag. So we can no longer simplistically view Japanese housing starts as a barometer of the country's economy without taking the trouble to examine the complex forces that determine their magnitude.

China

China is different. The Chinese consider their forestry sector is on the road to free market economics and has long left the "Dark Ages", which they define as from

250 BCE to 1911 CE (Yaoqi et al, 2000) (the "Golden Age" of Zhou governments with relatively benign forest policies having lasted from 1122BCE to 256BCE]. Vast in both area and population, China has the largest plantation area in the world, and an unusual profile of raw materials, with only 13.7% of pulp production using virgin wood fibre, with bamboo-based panel factories, firewood still a major product, and a wide array of oils, resins, lacquers, and other forest-based substances, including traditional medicines.

But we are concerned here with the quantity of life, with the sheer numbers of consumers to be expected. Many Chinese provinces contain more people than large countries elsewhere, but the consumer demand that drives industrial imports is largely located in the more affluent coastal cities and the special economic zones in the immediate hinterland. Urban Chinese number about 300 million, and, as a group, they have experienced possibly the fastest decline to low fertility ever recorded in human history (Zhao, 2001). (See Table 1) This was well underway even before the Government introduced the one-child policy in 1980. But the process of the fertility decline has been utterly different from the corresponding process in Europe, having been achieved almost entirely by the quantum effect and not by the tempo effect. This means it was not propelled by increased female education and participation in the workforce, or by marriage avoidance, as that institution is still intact.

It is likely that the Government will still maintain a strict stance against high-parity (three or more) births, but the regulations do permit couples to have two children if they are both the progeny of one-child families. The earliest cohorts of the nationwide family planning regulations are now reaching marriageable age so observers will soon know if fertility will rise – most of the evidence suggest it will not. An interesting feature of legislation everywhere, and one not often remarked, is that in making a new prohibition with a new law, governments inadvertently generate a *right* to the obverse of the action prohibited. For example, by requiring citizens to qualify for and obtain a licence to drive, governments imbue their citizens with a belief that they have a *right* to drive. In George Orwell's "Animal Farm" the ruling classes – the pigs – subtly change all the new laws the animals had agreed. One reads: "Everything which is not forbidden is compulsory". Perhaps in the post-Cold War era this should read "Everything which is not forbidden is a right". In the Chinese family planning laws, this human feature emerges as a belief in the *right* to have the one child that is permitted. (Quite possibly some women who might have had no children choose instead to exercise their right to have one). They exercise the right early in life, using grandmothers to ensure continued labour force participation. This is quite different from the Japanese female who postpones or cancels childbearing entirely. And it is entirely different from the Western female who may marry late or never marry. Marriage remains virtually universal for urban Chinese, and the peak of age-specific fertility has retreated from 27.5 years to 22.5 years. Quite contrary to the West, the mean age of childbearing has retreated and would probably go even younger if the minimum ages set by the Marriage Law for marriage were not so high (higher, in some local government rules, than the national legislation). The mean age at last birth has fallen by ten years in thirty years.

The parity progression ratio had been close to 1 until 1965, when the third child stared to become less frequent, followed by the second child in 1974. By 1997 the period parity progression ratio had fallen to 0.02 for third children, and 0.13 for second, a skewed distribution probably never before seen in human history.

In fact, demographers have been wrestling for some time with transition theory, their equivalent to the physicists' universal field theory. It still resists empirical testing, unless some demographer can live as long as Methuselah. The transition is that between 100,000 years of high mortality and high fertility, and a future of low mortality and low fertility, perhaps another 100 millenia.

Japan & China - Summary

The cumulative effect of low fertility in both countries leads to major problems of ageing and its concomitant issues the financing of pensions and healthcare. This is more dramatic in Japan's case, but even now in Shanghai there are 2.4 million people over 60 years of age. It also leads to acute labour shortages, and to sharp changes in people's expectations of middle age (40-50), in this case more prominent in China than in Japan – instead of the most stressful years, especially for women, sandwiched between children from 1 to 18 and ailing parents, these become empty nest "second honeymoon" years. As we are trying to examine the market aspects here, we shall devote a short space to the second issue, the labour shortage, because Governments are already taking some action on this matter, and their choices will affect the size and type of consumer market.

Japan – the Answer?

Japan is a versatile, self-disciplined nation in facing problems and adaptive in learning lessons. It weathered the first oil crisis with 18% per annum inflation, than successfully diversified and economized on energy consumption to the point where the second oil crisis eight years later produced hardly a blip in the inflation rate. However, it is ill-equipped historically to permit immigration of 200,000 workers per annum during the first half of this century to compensate for the labour force decline. Racially homogeneous, and deliberately isolated as a government policy for half of the last half millennium, existing long-term immigrants such as Koreans who have been there for ten generations and Chinese constitute 40% and 20% respectively of the 1.5 million foreigners in Japan. The cautious policy of giving "ni-sei" & "san-sei" (second- and third-generation Japanese born overseas) long-term working visas has brought in workers from Brazil (the largest group), Peru and other countries (another 20%) whose ancestors migrated from Japan during the agricultural depression a century ago. Filipinos (7.4%) also work under similar arrangements of temporary visas as those in Singapore and Hong Kong. Against this foreign group, still small in total, must be deducted the 800,000 Japanese who now live overseas, mainly in North America and Asia, but 5.7% in Oceania. So the market potential we must predict based on quantity of life is to be one of steady decline at one extreme and at the other a market to be segmented into declining levels of high-class produce and a renewed use for basic low grade commodities.

China – the Answer?

China is different. Overseas workers are not needed because of the huge pool of countryside labour. The swagmen cannot just drift in from out of the bush and line up at the factory gate for jobs. Rural-urban migration in China has been very strictly controlled, and only relaxed in the eighties. Different regulations on temporary immigration to population centers apply with those of the great megalopolis of

Shanghai the strictest. Reluctant to allow more permanent city-dwellers, but anxious to
exploit the pool of rural labour to eliminate shortages, the Government has allowed quite large groups of workers in the cities without the rights and privileges of the burghers (Zhao, op.cit.). Everyone recognizes this is unfair, but policy change will be slow. However, we can envisage that the safety valve of rural immigration (with the Beijing bureaucrat's hand on the lever) will lead to a homeostatic effect in maintaining the urban population, even though we now know from observation that the immigrant fertility levels will promptly drop on arrival, and there may be, like Japan, a possible two-tier society of rich burghers and poor migrants.

Do Lower Quantities of Life Mean Less Consumption?

We now conclude by asking what, if anything, all this demographic change might imply for the two markets we have been discussing. In the past four decades the world has experienced, despite periodic fluctuations, a strong increase in the total value of forest products trade, from US$6 billion in 1962 to US$155 billion in 1997, a fivefold increase in real dollar terms (Wardle & Michie, 2001). Although intra-European trade and US-Canada trade dominate in the period the Asia-Pacific group has doubled its share of exports and more than doubled its share of imports, the reduction being sustained by N. America and Europe. There is also evidence of an increased degree of regionalization in the Asia-Pacific trade. But globalization is important too, as quite distant countries export to the region and import from it. Japan, in these years, 1962-1997, increased her share of imports, i.e. at twice the world growth rate. Her trading partners changed, as the appetite for roundwood exhausted first the Philippines and more recently Malaysia and Indonesia with the trend to panels, sawnwood, and other manufactures, plus the added exports of China, Australia, and New Zealand.

To conclude suppose we take the gross value of all Japan and of urban China's imports of logs, sawn timber, veneer and plywood from ITTO statistics for 2000 and, assuming a constant per capita value throughout, extrapolate them over the next half-century for the two eventualities of declining populations without compensatory and with compensatory migration? Some possible results are shown in Table 2, wherein it has been necessary to make the following simplifying assumptions:

1) Japan's per capita annual consumption of the four products set at $58, and urban China's at $4. The latter is based on an average national value of $2, split into $4 for the 300 million urban population and $1.33 for the 1 billion rural population.
2) Populations begin decline at specific future projected dates, but a smoothed rate of 0.38%/annum is used here for both.
3) Per capita value consumption constant (the paper does not address this issue at all).
4) Only logs, sawn timber, veneer, and plywood considered (ITTO's limited mandate).

Table 2. Total Value of Imports of Logs, Sawn Timber, Veneer, and Plywood by Japan and Urban China in 2000 and 2050 under Assumptions of Low Fertility and Immigration Options (US$ billion)

	Urban China		All Japan	
	2000	**2050**	**2000**	**2050**
LFNI	1.33	1.10	7.37	6.04
LFCI	1.33	1.33	7.37	7.37

The differences, if controlled immigration does not occur, are large, easily more than the sum total of exports by Australia, New Zealand, and several other countries. It is also important to realize the extra difficulty facing Japan, which must compensate with *foreign* workers, whereas China can still use Chinese citizens. However, evidence to date suggests that China, or rather Chinese municipal governments, are still reluctant to give full residency rights to immigrant rural workers. If this huge problem is inadequately solved by either or both countries, exporters might face a segmented market, and this segmentation will be based on purchasing power.

Table 1. Total fertility rates in China

Year	**China**	**Urban China**	**Year**	**China**	**Urban China**
1950	5.81	5.00	1975	3.57	1.78
1951	5.70	4.72	1976	3.24	1.61
1952	6.47	5.52	1977	2.84	1.57
1953	6.05	5.40	1978	2.72	1.55
1954	6.28	5.72	1979	2.75	1.37
1955	6.26	5.67	1980	2.31	1.15
1956	5.85	5.33	1981	2.61	1.39
1957	6.41	5.94	1982	2.86	1.58
1958	5.68	5.25	1983	2.42	1.34
1959	4.30	4.17	1984	2.35	1.22
1960	4.02	4.06	1985	2.20	1.21
1961	3.29	2.98	1986	2.42	1.24
1962	6.02	4.79	1987	2.59	1.36
1963	7.50	6.21	1988	2.52	-----
1964	6.18	4.40	1989	2.35	1.55
1965	6.08	3.75	1990	2.31	-----
1966	6.26	3.10	1991	2.20	-----
1967	5.31	2.91	1992	2.00	-----
1968	6.45	3.87	1993	-----	-----
1969	5.72	3.30	1994	1.60	-----
1970	5.81	3.27	1995	1.46	1.13
1971	5.44	2.88	1996	1.55	1.33
1972	4.98	2.64	1997	1.49	1.14
1973	4.54	2.39	1998	1.49	1.13
1974	4.17	1.98	1999	-----	-----

Source: Zhao (2001) ""Low Fertility in Urban China"

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