

# The underlying issue of declining birth rates in Nordic Europe

**Alfred Wong**

Friends of Aboriginal Health, taiping@fnaboriginalhealth.net

## Abstract

Nordic countries have experienced a century-long decline in birth rates, just like in most other countries in Western Europe. For many decades, demographers have been struggling to explain this phenomenon. For various national and cultural reasons, the nation state is interested in devising ways and means of rectifying this steady decline. There appears to be an inverse quantitative relationship between birth rate and economic prosperity as depicted by per capita gross national income. This empirical correlation was found to exist in case-study countries with significantly different cultural values, viz. Finland and Singapore. The long-term decrease in natality was discovered to be strongly related to steadily rising economic prosperity in advanced economies. Reversing the gain in per capita gross national income could not be considered realistically within the pervasive neoliberal economic framework. In view of this finding, there may be no practicable solution to the problem of declining birth rates in advanced economies, notwithstanding any cultural-value differences. It could be speculated that emerging economies would experience declining natality as they become advanced economies.

KEYWORDS: economic prosperity, Finland, lifestyle, natality, population, Singapore

## Introduction

The demographic issue of declining birth rates in Western Europe and other highly-industrialised nations has been well known for decades. In earlier times, the importance of birth rate<sup>1</sup> was tied to the maintenance of cultural identity and national existence (see Akenson, 2011, for the example case of Sweden during the second half of the 19<sup>th</sup> century). In more recent times, the ageing of the national population arising from declining birth rate has become a policy concern of governments from a somewhat different perspective. The foremost question has become: will sufficient numbers of younger people be working

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<sup>1</sup> In this paper, birth rate is given as a percentage of population for the sake of convenience, instead of the customary “numbers per 1,000 persons”. Birth rate is based on the period count of actual births for a given population, regardless of age or sex ratio. In comparison, fertility rate, total or age-specific, is a construct from actual births recorded for segmented age groups of women. This parameter is affected, by among other things, the definition of child bearing years, marriages, contraception and abortion over a specified time (see, for example, Heliniuk 2010).

in future years to pay taxes for the financing of established generous welfare systems? The previous discourse of the preservation of cultural identity and national existence has largely faded.

The traditional Demographic Transition Model (DTM) attributes the decline in birth rate (with concurrent decline in death rate) to the shift from pre-industrial economy to post-industrial economy of a nation state over time (see, for example, World Bank 2004). Figure 1 shows a stylised time-course of birth and death rates. The DTM posits that in the pre-industrial era, the birth rate was high to compensate for high death rate arising from hunger and pestilence. As the popular economy progresses to the industrial stage, food becomes more abundant with mechanized agriculture and diseases are suppressed with improved hygiene. Finally in the post-industrial stage, the fall in births is commonly attributed to, among other things, increases in the status and education of women, urbanisation, as well as access to contraception. In the distant future, the death rate has been predicted to even exceed the birth rate to cause an overall decline in population. However, the definition of “industrialisation” has changed considerably since the start of the Industrial Revolution of the mid-1800s in England. For example, electronic trading of financial services has replaced the manufacturing of goods in many countries since the last decade of the 20<sup>th</sup> century. There are also notable exceptions in which the DTM does not appear to be applicable for countries that had never undergone any substantial “industrialisation” or had been purposely de-industrialised.

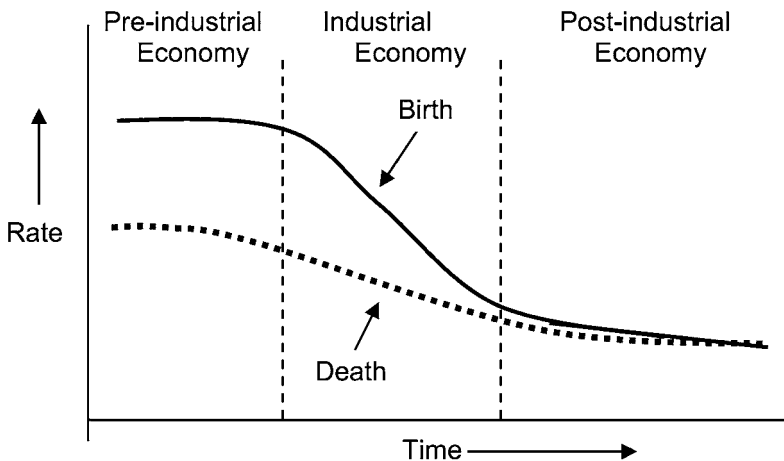


Figure 1: Time-course birth and death rates, as depicted by an idealized Demographic Transition model (adapted from World Bank 2004)

Moreover, the traditional DTM is not applicable when there are substantial changes during social upheaval such as those in the traditional Christian republics of the former USSR in the 1990s. Wong (2016) recently described the case of Latvia in which

a population crash manifested when a (rising) death rate exceeded a (declining) birth rate by a large margin for several decades after the demise of the Latvian Soviet Socialist Republic (LSSR). In the decades after the end of the LSSR era, there was in fact significant “de-industrialisation” in Latvia, in which many LSSR-era manufacturing industries were abandoned or destroyed abruptly. The Latvian birth rate continues to fall, contrary to the predicted reversal of the direction of the DTM curve.

Natality is a highly complex issue that has multiple determinants. The upper limit of birth rate could not be easily defined, because of such confounding factors such as multiple births (e.g., twins or triplets) and the intensification of birthing frequency (e.g., virtual continuous pregnancies over the course of a typical 30-year span of a woman childbearing period). In comparison, a decline in the death rate is well understood technically as it relates to greatly improved physical and mental health care systems in enabling people to live longer. However, the death rate will ultimately reach a terminal value as there is a finite limit in human longevity, regardless of improvements in all aspects of human health care.

The issue of declining birth rate (or total fertility rate) has long been exceedingly perplexing (see, for example, Feyrer et al. 2008; Pritchett & Viarengo 2012). Considerable research has been made and is being undertaken to elucidate the issue of fertility and natality in Europe over the past several decades (Balbo et al. 2013). The focus of recent demographic research has largely been on, among other things, family policies and the role of women in society.

In the 1980s, the “Second Demographic Transition – SDT” concept gained considerable currency among many European demographers (see, for example, van de Kaa 1987; Lesthaeghe 1991; van de Kaa 2002; Surkyn & Lesthaeghe 2004; Sobotka 2008; Lesthaeghe 2010). The SDT concept is focused largely on the post-1960 period in northern Europe; it sought to explain the natality decline in terms of changing societal attitudes in many western European countries since the 1960s. Sobotka (2008) has provided an instructive example of time-course changed valuation of personal leisure and friends over traditional parenthood, which is generally believed to be absent in the pre-1960 era in northwestern Europe. However, these attributes could not be defined quantitatively.

There is an acute absence of SDT analysis of the underlying foundation of these social and cultural changes. In particular, the impact of the steady convergence of the global economy to an accentuated cash economy has notably been ignored. Thus, there may indeed be a single common element driving the decline in natality which may also be apparent beyond western European nation states. In order to discover the common element, it is necessary to analyse and compare at least two different national societies with similar population size and low levels of recent immigration (or emigration). Ideally, societies chosen for comparison should have significant differences in cultural tradition.

This paper aims to test the hypothesis that declining natality in developed economies is tied to the increase in the economic prosperity of the population. An empirical approach could only be undertaken as many confounding cultural, social, economic and political factors could not be defined quantitatively. The traditional substitute of deploying surveys of the target population is usually deficient because of inadequate sampling size and un-representative sampling of the population.

## **On the methods**

Published official statistics were deployed extensively. In view of known intervention by countries in the collection and distribution of official statistics, the usual caution about the absolute reliance on the verity of such statistics applies (see, for example, MacCoun, 2001; Webster, 2012, for examples of state intervention for domestic and foreign political reasons). Additional statistical data were sourced principally from United Nations Statistics database ([www.unsd.org](http://www.unsd.org)).

The data year 2015 was chosen because it was, at that time, the most recent year with complete statistics published by various national and international agencies.

Singapore was deemed to be an ideal candidate for the comparison of natality trend in Nordic countries, by excluding confounding demographic factors such as population size and immigration.

## **Geographical context**

The Nordic countries, comprising of Denmark, Finland, Iceland, Norway and Sweden, form a very homogeneous demographic region in Western Europe. Some selected characteristics of the five Nordic countries are given in Table 1. Similar status of human development and income inequality suggests considerable societal similarity, as attested by the substantial historical cultural and racial homogeneities of these five countries, from 1900 onwards. The present-day dominant indigenous people are Finno-Ugric in Finland, and Norse in Denmark, Iceland, Norway and Sweden (Nordstrom 2000). At present, each constituent racial group still accounts for 90% or more of the national population. Although Iceland is a constituent of the Nordic countries, its small population size was not considered to be particularly suitable for robust statistical analysis. In essence, small changes in births or deaths could cause large “unrepresentative” percentage changes. Because of their proximity to continental Europe for external population mobility, Denmark, Norway and Sweden were not considered to be suitable primary candidates for this study. Analysis of the critical elements of the national demographic situation is known to be complicated by the movement of substantial number of immigrants who are not related to the indigenous people. Finland was selected to be the best representative of Nordic countries because of its relative “remoteness and insularity”, with little or no inward migration during most of the 20<sup>th</sup> century. The mass movement of Finnish-speaking people (net 250,000 to 400,000) from Eastern Karelia into present-day Finland in the aftermath of the 1939-1940 Winter War only changed the national population density and not most other major social-cultural demographic indices. Finland had lost about 10% of its pre-1939 territory to the USSR (Nenye et al. 2015). Because Finland chose to follow the successful active-neutrality foreign policy built prudently by former Presidents Juho Paasikivi and Urho Kekkonen in the late 1940s, mass migration of disgruntled USSR citizens via neighbouring Estonia and Western Russia into Finland was deterred decisively during the following five decades.

Table 1: Selected features of the five Nordic countries

	Nominal population (2015)	2014 Human Development Index*	2014 Gini Index#
Denmark	~5.7 million	0.923	26.9
Finland	~5.5 million	0.883	27.8
Iceland	<0.5 million	0.899	26.3
Norway	~5.2 million	0.944	26.8
Sweden	~9.7 million	0.907	26.1

\* Human Development Index (HDI), embodying life expectancy, educational attainment and gross national income, was designed to characterize the relative state of human well-beings. The data are published annually by the United Nations Development Programme since 1990 (UNDP 2015). It may be noted that HDI could only be calculated for countries that have capitalistic free-market economies. For example, in the case of Cuba, per capita gross national income has no practical meaning.

# The Gini Index is a means to estimate the income inequality of a population. The value 100 depicts total inequality and the value 0 depicts perfect equality. The data have been published annually by the United Nations Development Programme (UNDP 2015).

For comparison of Nordic demography, Singapore was considered to be the best candidate because of its high racial homogeneity (~75% Chinese officially), and similar population size (population ~5.5 million in 2015) as Finland. Singapore has a distinctly different Asian cultural base. Inward migration to Singapore has been very small because of its longstanding restrictive citizenship policy. The 2014 Human Development Index for Singapore was reported to be 0.912 (UNDP 2015), in the same range as the Nordic countries. However, unlike the Nordic countries, the 2014 income inequality (viz., Gini Index) in Singapore was reported to be substantially higher at 46.4 (CIA 2014). In comparison, the 2014 Gini Index for Finland was 27.8, as given in Table 1. It has been suggested that longstanding governmental policy obsession with meritocracy has probably fostered the extraordinary inequality (see, for example, Binte Anwar 2015; Tan, 2008; Tan 2016). Nevertheless, relying on the Gini Index to describe national economic inequality might be somewhat misleading (c.f. Wong & Ribeiro 2017).

## The underlying situation since 1900

The general trend of declining birth rates in the Nordic countries is largely similar to those of the countries in Western Europe. Figure 2 shows that the decline in the five Nordic countries has been progressing steadily since 1900. The 20-year moving average data were selected for analysis. In this approach, fluctuations within a narrow band, i.e., small time period, were smoothed to facilitate the assessment of the long term demographic trend. For example, Andersson (2004) had cited a marked increase in total fertility rate (derived from natality) in Denmark, Norway and Sweden from about 1980 to 1990. Note that the 20-year moving average trend shown in Figure 2 did not reveal such a spike in natality. Nevertheless, there was considerable excitement among demographers about the apparent increase in fertility rate in Sweden during a short period of the 1980s (see, for

example, Hoem, 2005) and in nine European countries<sup>2</sup> during 2000s (Bongaarts & Sobotka 2012). Goldstein et al. (2009) even posited that end of low fertility in Europe might be nigh. In retrospect, the excitement arose mainly from observations of relatively small changes in the total fertility rate over a short time span (Bongaarts & Sobotka 2012: 109). The natality data in Figure 2 show these minor perturbations to be largely inconsequential when the assessment is made over a longer time frame. In essence, the trend of declining birth rate (in Sweden and elsewhere in Europe) remains unabated. It is obvious much larger increases in fertility sustained over several decades would be required to afford a real change of course.

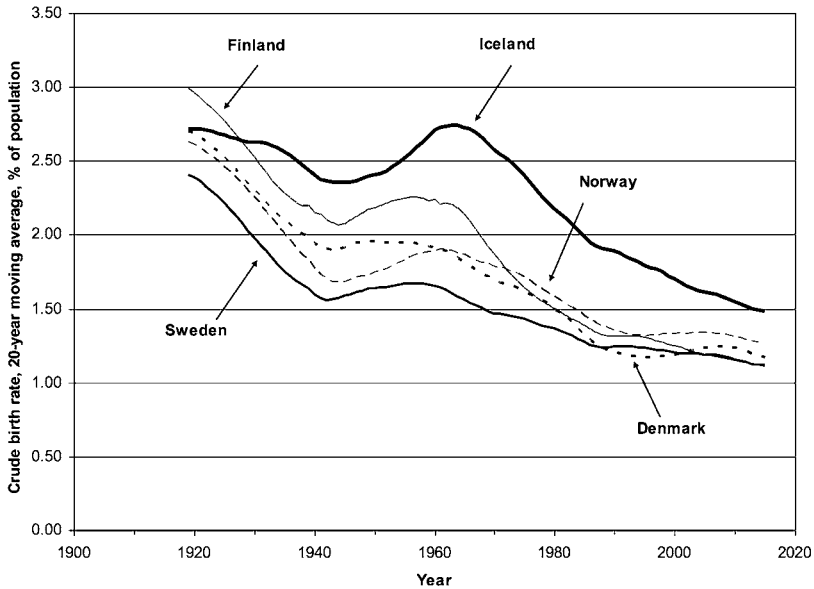


Figure 2: Crude birth rate (20-year moving average) of Nordic countries since 1900

This observation of longer-term natality decline would not be different even if the total fertility rate was used instead of the crude birth rate as the defining parameter. Figure 3 shows an excellent linear correlation between crude birth rate and total fertility rate for Finland, in the time from 1900 to 2015. Data for Sweden over the same time were added to confirm the verity of the correlation. If a total fertility rate of 2.1 was considered to be the threshold value for national population replacement (Castles 2003), then the corresponding crude birth rate in Finland would need to be  $\geq 1.5\%$  of the population.

<sup>2</sup> The nine countries cited were Bulgaria, Czech Republic, Estonia, Finland, Netherlands, Russia, Slovenia, Spain and Sweden.

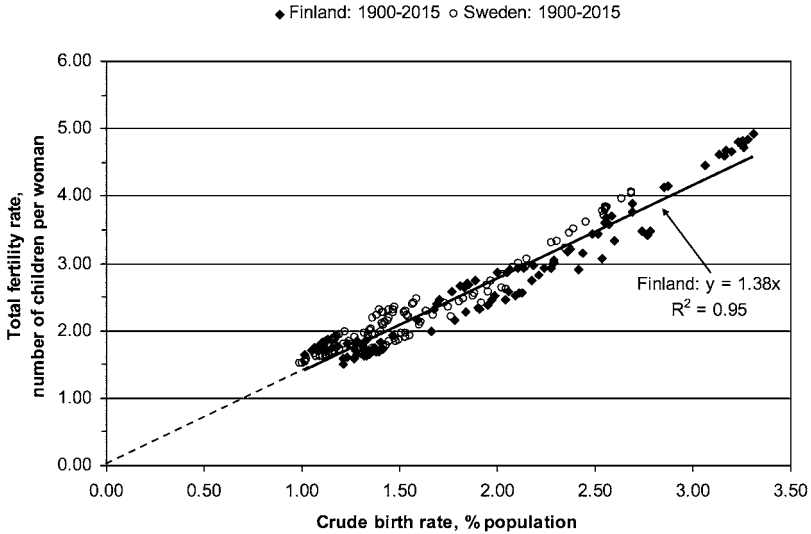


Figure 3: Correlation between total fertility rate and crude birth rate for Finland and Sweden (Statistics Finland 2016; SDS 2015; UNSD 2016)

Note: As defined by Statistics Finland (2016), the total fertility rate is obtained by adding up the fertility rates calculated for one year. The rate refers to the estimated number of children born to a woman, given that the fertility rate of that statistical year prevails during the whole reproductive period of this woman on condition that the woman does not die before the end of the said period (Statistics Finland 2016a, 2016b; Statistics Sweden 2016).

In the context of the DTM, Iceland never experienced an industrialisation phase in its history, and yet the birth rate had been declining steadily since 1900. This situation is contrary to the prediction of the classical DTM. The occurrence of similar long-term decline in birth rates in the Nordic countries suggests that there might have been certain common causal elements in these Nordic societies since the early 20<sup>th</sup> century.

## Singapore comparison

Singapore is racially and culturally very different from Finland. As shown in Figure 4, the birth rate in Singapore has declined steadily from 3.0% to 1% over approximately 40 years, i.e., from 1970 to 2010. It is interesting to note that the same magnitude of decrease in Finland took about 100 years, i.e., from 1910 to 2010. In response to fears of overpopulation in the island state, the Singapore government had implemented a disincentive policy to discourage larger families, i.e., more than two children per family, between about 1970 and early 1980s (Yap 2007). This policy was reversed in about 1985 to become pro-natalist selectively for university-educated women, as a means to counter the continually declining birth rate.

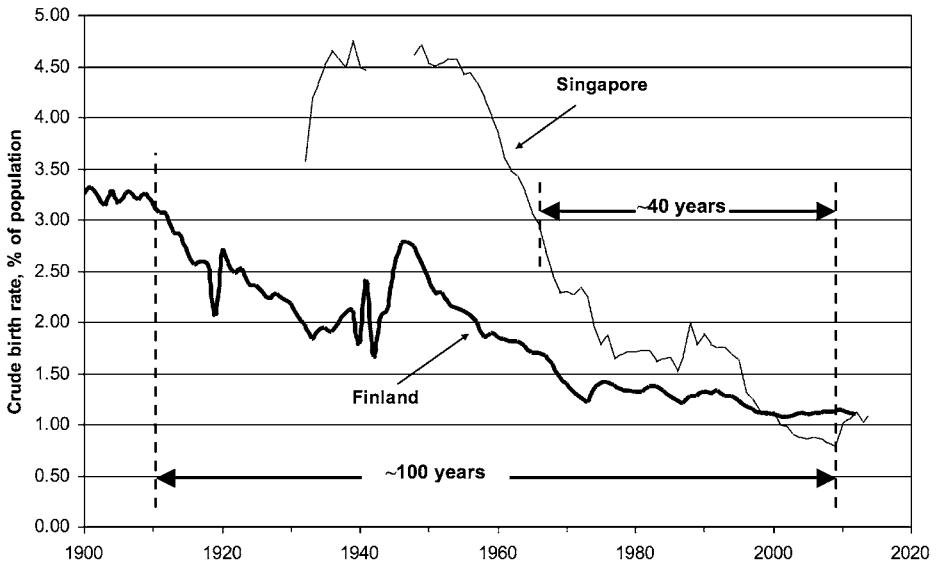


Figure 4: Declining birth rates in Finland and in Singapore (Statistics Finland 2016; SDS 2015; UNSD 2016)

The improved efficiency of farming requiring a smaller labour force, improved food-supply logistics and the growth of urban centres with increased availability of services and amenities are often cited being factors affording lower birth rates, as characterised in the industrialisation phase of the DTM. There was no large scale rural-urban shift in Singapore because the cultivated land in Singapore has always been very small. Since the 1820s, Singapore has been thriving largely on its entrepôt status (Siddiqui 2010; Abshire 2011; Frost & Balasingamchow 2012). Since the 1990s, there has been a decisive government-directed shift from industrial manufacturing activities to financial services which are not easily definable as a traditional industry. The remaining physical labour-intensive manufacturing industries, viz., petroleum refining and ship repairs, are now staffed by “guest workers” imported from such countries as Bangladesh, Pakistan and India. It may be noted that these guest workers are not counted as a part of the Singapore national demographic analysis. Other general service workers such as female domestics imported from the Philippines and male bus drivers recruited from China are also excluded from the national demographic account. The rights of guest workers are very limited<sup>3</sup>. In contrast, there was a significant shift in rural to urban population ratio in Finland throughout the 20<sup>th</sup> century (Nordstrom 2000). Unlike Singapore, the deployment of foreign guest workers in Finland has remained very limited until recent years.

<sup>3</sup> Female “guest workers” who become pregnant are deported routinely. There are absolutely no rights of family reunification for any “guest workers”. For Singapore, the proportion of “guest workers” in the total population count is about 30% (SDS 2015).



## Economic prosperity

Defining the economic prosperity of a population is extremely difficult even when the distribution of monetised wealth among the population is more or less equal. Moreover, relationships among numerous cultural, social and economic factors are difficult to quantify. The per capita gross national income (GNI)<sup>4</sup> might be the best-practical means to quantify economic prosperity.

What is the underlying cause of this similar natality outcome in both Finland and Singapore? The answer might be found in the rise of per capita GNI over previous decades. Figure 5 shows the time-course changes in birth rate and per capita GNI. The two opposing curves appear to have little or no relevance to the industrial status of a nation. It is only a matter of a country becoming wealthier by one means or another.

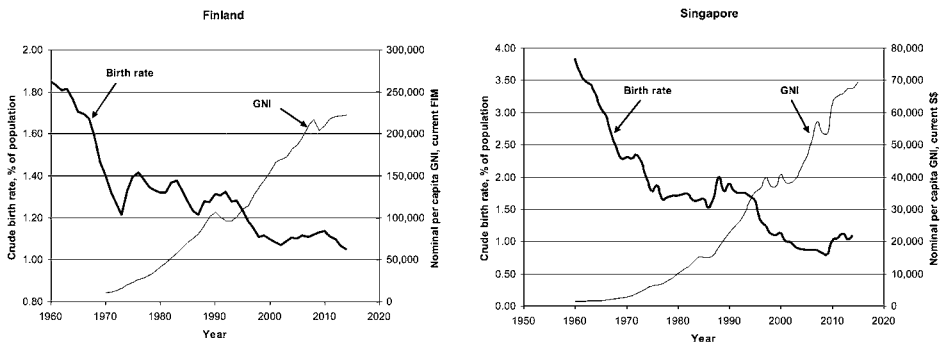


Figure 5: Time-course changes in birth rate and per capita GNI (Statistics Finland 2016; SDS 2015; UNSD 2015; UNSD 2016)

Note: After February 1, 2002, the Finnish markka (FIM) was calculated from the euro at the fixed rate of FIM 5.94573 per Euro.

Figure 6 illustrates the direct relationship between birth rate and per capita GNI (expressed as current US\$)<sup>5</sup>. Note that even though Singapore is culturally very different from Finland, the general trend of declining birth rate with rising per capita GNI is interestingly similar. The large difference in income inequality (i.e., Gini Index) between Finland and Singapore appears to have little or no impact on the resulting correlation. The best-fit equation has the following form:

<sup>4</sup> GNI = Gross National Income is given to be the sum of gross domestic product (GDP) plus remittances and other financial transfers from abroad. GDP is a summation of all values of goods and services produced nationally over a specified accounting period. It may be that GDP accounting is variable according to the methodology applied (World Economics 2015). Both GNI and GDP would best be expressed in the national currency.

<sup>5</sup> The use of US dollar for comparing economies of different countries is fraught with difficulties because of inherent technical uncertainties of currency exchange rates. The rates are subject to distortion by, among other things, changing value of the fiat US currency, government monetary policies and willful manipulation of foreign-exchange market by traders. In the present study, current US dollar was used for comparison by default.

$$y = ax^{-b}$$

where  $y$  = birth rate, as % of population  
 $x$  = per capita GNI, in a suitable currency

Both coefficients “a” and “b” could be expected to be influenced by, among other things, mass inward or outward childbearing-age migration, and particular country-specific lifestyles. It should be noted that the above equation is entirely empirical. Any theoretical basis has yet to be uncovered. The qualitative reasoning for this outcome could be speculated to be due to the multi-facet outcome of economic prosperity in the accelerated ascendancy of the neoliberal economic model.

◆ Finland 1913-2012 □ Singapore 1960-2014

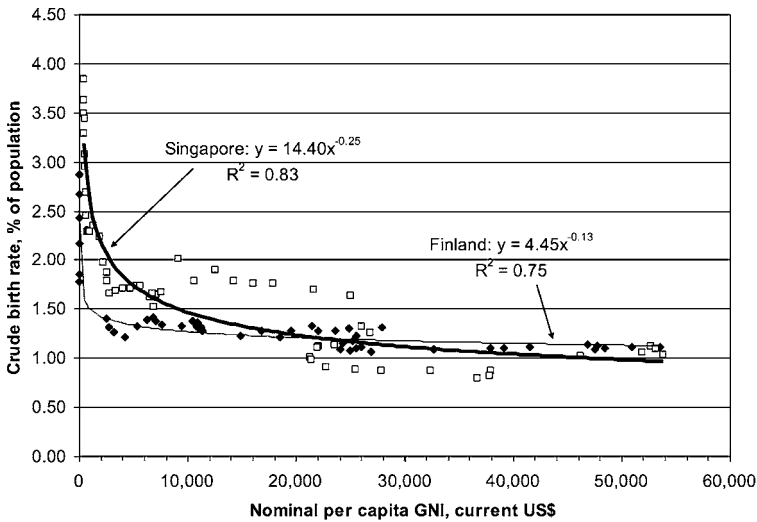


Figure 6: Relationship between birth rate and per capita GNI (Various Nordic statistical agencies 2016; UNSD 2015)

Note: The construction of the pre-1970 segment of the correlation curve for Finland was realised by calculating the per capita GDP in successive steps from Finnish markka (FIM) to Swedish kroners (SEK) and finally to US dollars. The earliest year of published relevant exchange rates was 1913 (Edvinsson et al. 2010: Table A7.10a for FIM → SEK, and Table A7.2 for SEK → US\$). Calculations of per capita GDP were made similarly for 1920, 1930, 1940, 1950, and 1960. In all pre-1960 instances, GDP was considered to be identical to GNI.

Figure 7 shows the existence of this general relationship between birth rate and per capita GNI for the other Nordic countries. As discussed earlier, the apparent anomaly in the Icelandic data might be due to statistical distortion caused by the relative small size of the national population. Nevertheless, the factual persistence of higher time-course

birth rate of Iceland would certainly warrant investigation by further detailed analysis of the local cultural, economic and political circumstances.

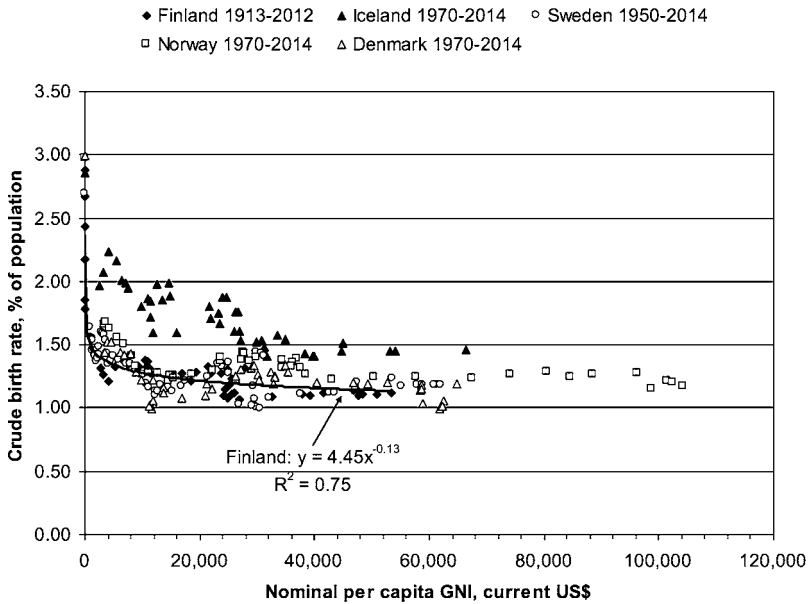


Figure 7: Birth rate and per capita GNI for Nordic countries (Various Nordic statistical agencies 2016; UNSD 2015)

## Changed societal structure

### Second demographic transition

Various demographic and societal characteristics have been used to define the SDT in western Europe. There are numerous reasons to doubt the fundamental validity of these changes causing the SDT. In consideration of the Nordic data shown in Figure 2, the rate of change of crude birth rate in the pre-1940 era was largely the same as that in the post-1960 era. One could easily argue that there may be coincidental correlation between observed social-cultural changes and post-1960 natality decline. Some of the cited SDT characteristics (see, for example, Lesthaeghe 2014) might be considered to be somewhat impertinent. For example, rising pre-marital cohabitation, rising divorce rates, and decline in marriage rates might have little or nothing to affect fertility (natality) quantitatively. In view of the data given in Figure 2, the First Demographic Transition and the Second Demographic Transition (as characterized by Lesthaeghe 2014) might be merely a continuum of a long-term trend starting from about 1900. The “interruption” of the declining trend in the 10-15 years after the end of WW II is still not well understood.

Elaborate quantitative analyses have been made by various demographers to explain the causes of the decline on the basis of the SDT concept. For example, the study

of Surkyn and Lesthaeghe (2004) relied on the 1999 European Value Survey (EVS) for the quantification of SDT characteristics. In the particular case of Scandinavia, viz., Denmark and Sweden, the sample size of the EVS was only 888 persons out of a combined 1999 population of about 14 million. Construction of a demographic explanation would thus be technically trivial on the basis of such a miniscule sample size. There have also been some doubts that the overall validity of the SDT concept might be somewhat limited outside of its foundational base of northwestern Europe.

Many facets of SDT are nebulous which defies facile definition and quantification. Furthermore, it is expected that the validity of the SDT concept becomes questionable when there are substantial political and economic disturbances in a country to affect increasing (or decreasing) birth rate. Witness the demographic trend of Latvia prior to and after the 1990 demise of the Latvian Soviet Socialist Republic (Wong 2016). The application of the SDT concept in this case would obviously be nonsensical.

The underlying qualitative reasons about the reduced birth rate and the increased personal economic wealth are not casual, i.e., not by chance. The pursuit of personal economic wealth has become relentless in the present-day cash-based society. To a large extent, this aspect of societal change has been overlooked by many demographic researchers as the critical factor affecting the birth rate. The increasing obsession of making (and spending) money might be expressed aptly as “Money is the god of our time”<sup>6</sup>. The pervasive neoliberal economic model fosters the righteous ideology of determined acquisition of personal wealth and other goods. Indeed wealth accumulation becomes the obsessive driving force of contemporary societies, especially in advanced economies such as the Nordic countries. Conspicuous consumption epitomises “success and living well”. Acquisition of money by whatever means has become the highest goal in individual achievement in the neoliberal free-market economy. In practice, two adults working in a 2-person family unit mean having more money to spend at will, in fulfilling the aspirations of the middle-income class. This situation cascades into, among other things, the intractable issue of “time scarcity” and subsequent rise in consumer trend of ready meals and dinner kits<sup>7</sup> (see, for example, Gordon 2003; Graven 2012; Moskin 2013) in both Western Europe and North America.

### ***Disposition of personal wealth***

The rapid growth of consumerism in Western Europe (as well as in North America) over the past few decades (see, for example, Kharas & Gertz 2010) would probably be more relevant in shaping attitudes toward natality. With the renewed ascendancy of neoliberal economics in Western Europe and North America in the early 1980s (Harvey 2005), there was a substantial corresponding expansion of consumer credit in Nordic countries (Baron & Xiong 2016). In parallel, hedonism has since evolved to become a critical ele-

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<sup>6</sup> These *bons mots* were written in 1841 by Heinrich Heine, the 19th century German poet, in reference to the emerging Rothschild financial empire in Napoleonic Europe (Ferguson 2008: 85).

<sup>7</sup> The delivery of dinner kits via the Internet was first started in 2007 by Middagsfrid in Sweden. Details of this offering is available in [www.middagsfrid.se](http://www.middagsfrid.se).

ment of intensified marketing of goods and services to consumers (O’Shaughnessy & O’Shaughnessy 2002). The ready availability of “instant buy now-pay later” money in turn irreversibly alters the societal values of vanity and materialism (see, for example, Lange & Meir 2009; Srikant 2013). Indeed relentless pursuit of money becomes the vehicle of attainment, causing fertility (natality) to become an incidental element of life. Fertility can not offer sufficient self-esteem, hedonism, or vanity to a woman or a man in the contemporary society.

### **Participation of women in the labour market**

The advancement of equal opportunities of women in gainful employment has often been cited as a major cause of declining birth rate in developed economies (see, for example, Andersson 2000; Adserà 2004; Ahn & Mira 1999). However, the proposition is somewhat tenuous as Nordic countries have already codified ex-home employment equality for women in the 1920s, and female labour participation level has always been high (see, for example, Nordstrom 2000: Chapter 11).

As shown in Figure 8, the increased participation of female adults in the labour market appears to have a causal role. Note that the 1% crude birth rate in Singapore was reached when the female labour participation rate was at about 55%. In comparison, the 1% crude birth rate in Finland was attained when the female labour participation rate was at about 70%. This differential outcome suggests that personal economic wealth (as depicted by the per capita GNI) might be the underlying (more fundamental) correlate to birth rate.

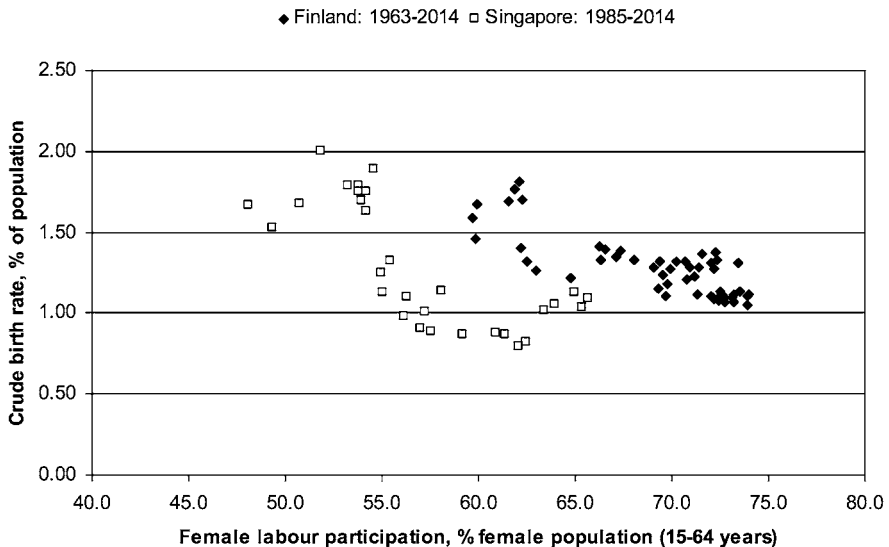


Figure 8: Comparative time-course crude birth and female labour participation rates (ILO 2016; OECD 2016; SDS 2015a, 2015b; Statistics Finland 2016a, 2016b)

Figure 9 shows that the correlation between per capita GNI and female labour participation rate for Finland to be distinctly different from that of Singapore. To a large extent, female labour participation in either Finland or Singapore could reasonably be linked to the underlying desire for greater personal (family) income, and consequent natality reduction. The relationship between fertility (natality) and personal income is supported in part by the work of Rønsen (2004) in which the higher female adult wages were found to delay time to first birth and to reduce the likelihood of second or third conception. In other words, higher income (as depicted by per capita GNI) leads to a lower birth rate (in tandem with total fertility rate).

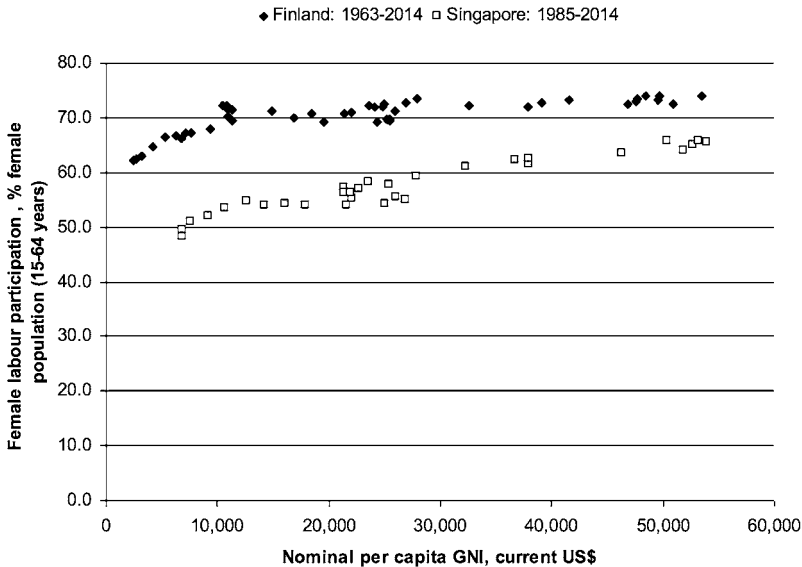


Figure 9: Relationship between female labour participation rate and per capita GNI (ILO 2016; OECD 2016; SDS 2015; Statistics Finland 2016)

### Other social and economic considerations

Does class structure relate to fertility? The attempt of Skirbekk (2008) to establish a correlation between the fertility of upper class and lower class over several hundred years (in Europe and North America) is notably weak. Most of the reported correlations shown had correlation values ( $r^2$ ) being  $<0.2$ . Moreover, definition of upper class and lower class as deployed by Skirbekk (2008) is crucially very subjective

Some demographers have also tried to link recurring episodes of economic recession (i.e., business cycles) to falls in birth rates (Sobotka 2011; Hofmann & Hohmeyer 2012; Goldstein et al. 2013). But the correlation becomes tenuous when the long term trend of birth rates is considered. Contrary to the suggestion of Andersson (2004: 171-172), small variation in total fertility rate as caused by broader business cycles is impossible to detect unequivocally.

Classical economic theories have been deployed by some demographers to model fertility changes (see, for example, Willis 1973; Lesthaeghe & Surkyn 1988; Ma-counovich 2003). For example, decision to have children becomes a classical cost-benefit economic analysis. Unlike a house or other material goods, there is effectively no trade or discard of unwanted child(ren) in most, if not all, contemporary societies. It follows that there could be no basis for the commodification of natality decisions.

### Global implications

It is inherently difficult to compare demographic trend of different countries (nation states) with large differences in, among other things, population size, degree of racial-cultural homogeneity, economic paradigm and political structure. Nevertheless, Figure 10 shows that the highest birth rate occurs in countries with lowest per capita income. The 28 cited low-income countries are located mainly in Africa. As evolution of birth rate in Singapore (or Finland) has been shown to be tied to the long-term changes in per capita GNI, the birth rate of the “present low-income” countries could be expected to decline in a similar fashion over time, regardless of their industrialisation status. Accessibility to contraceptives and other family planning tools in present low-income countries might thus be of little or no utility in reversing high birth rates. It is of course conjecture presently that the birth rate of now low-income economies might reach a similar “stabilised” low birth-rate level of Singapore, if and when economic prosperity is achieved.

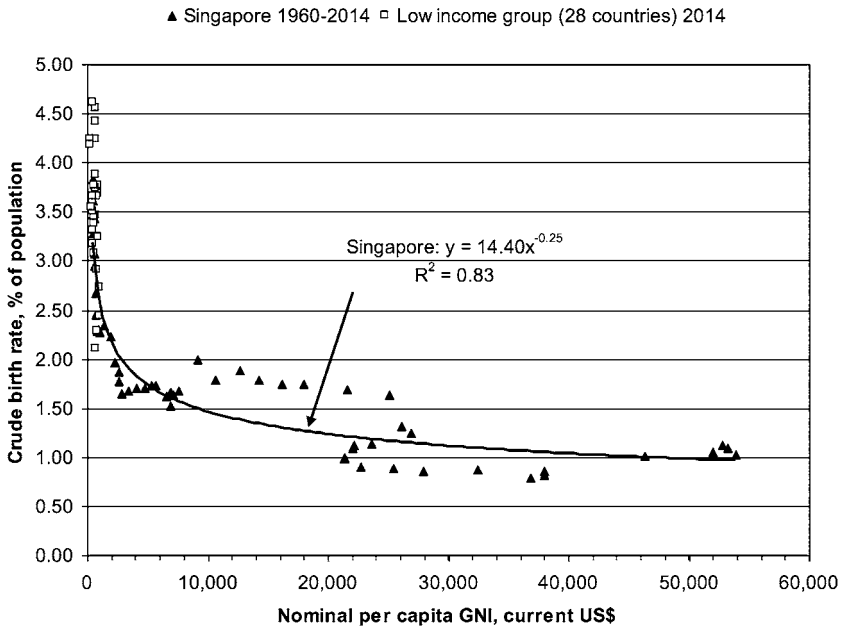


Figure 10: Projection of birth rate and per capita GNI of low-income countries (SDS 2015; UNSD 2016, World Bank 2015)

## Concluding remarks

Economic prosperity (as depicted by the per capita GNI) has been shown in this paper to be the single most important parameter affecting birth rate (natality). In the field of demographic research, the strong inverse relationship found is exceptional. Rising economic prosperity drives changes in self-centred personal attitude towards, among other things, allocation of leisure time, acquisition of material wealth and ostentatious consumption of goods and services. All of which would affect natality. This finding overrides essentially all other characteristics of demographic and societal changes implicated in the well-known Second Demographic Transition model. The inverse relationship between natality and per capita GNI could be assumed reasonably to be applicable in all cash-based societies. Reversing the gain in per capita GNI to induce higher birth rates could not be considered realistically within the pervasive neoliberal economic framework. In essence, real increase in per capita GNI can not be reversed.

With ever increasing willingness of the nation state, e.g., in Nordic countries, to allocate personal financial benefits for family formation, the inevitable effective outcome might be a “baby-making factory” business model, in which recruited participants are rewarded for achieving certain productivity goals. Aside from national budgetary limitations, there is also no certainty that such a production modality could ever be realized in present-day unfettered free-choice societies. The regrettable reality is that the underlying cause(s) of declining birth rate would not be remedied at all (by mass immigration, for example), without considerable alteration of national and cultural characteristics.

## Conflict of interest

The author declares that he has no conflict of interest.

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## Povzetek

Tako kot večina zahodnoevropskih držav, se tudi nordijske države srečujejo s stoletnim upadom rodnosti. Demografi se že več desetletij trudijo pojasniti ta pojav. Zaradi različnih nacionalnih in kulturnih razlogov so nacionalne države zainteresirane za oblikovanje načinov in sredstev za odpravo tega stalnega upada. Zdi se, da obstaja obratno kvantitativno razmerje med stopnjo rodnosti in gospodarsko blaginjo, kot je prikazano na bruto nacionalnem dohodku na prebivalca. Ugotovljeno je bilo, da ta empirična povezava obstaja tudi v državah, ki imajo zelo različne kulturne vrednote kot sta Finska in Singapur. Ugotovljeno je bilo, da je dolgoročno zmanjšanje rodnosti močno povezano s stalno rastočo gospodarsko blaginjo v razvitih gospodarstvih. Zmanjševanja bruto nacionalnega dohodka na prebivalca v prodornem neoliberalnem gospodarskem okviru ne bi bilo mogoče realno pričakovati, glede na to ugotovitev pa morda ni praktične rešitve za problem upadanja rodnosti v razvitih gospodarstvih, ne glede na razlike v kulturnih vrednotah. Lahko bi zgolj špekulirali, da bodo nastajajoča gospodarstva doživela upadajočo stopnjo natalitete, ko bodo postala naprednejša.

**KLJUČNE BESEDE:** ekonomska blaginja, Finska, življenjski slog, rodnost, prebivalstvo, Singapur

CORRESPONDENCE: ALFRED WONG, Friends of Aboriginal Health, Post Office Box 34173, Station D, Vancouver V6J 4N1, Canada. E-mail: [taiping@fnaboriginalhealth.net](mailto:taiping@fnaboriginalhealth.net).