



Housing price, elderly dependency and fertility behaviour

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A B S T R A C T

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Sustaining declines in fertility have increasingly become an alarming issue in most of the world economies. Many governments have been making enormous efforts to alleviate such intertwined problems as falling fertility and soaring elderly dependency. What really makes fertility rates fall? Does housing price have a role (as many argue)? Most researchers addressed this issue from a demographic perspective, but have yet to fully unravel the mystery of human fertility behaviour. The paper aims to investigate the novel linkages between birth rate, housing price and elderly dependency, with the case of Hong Kong. It employs two key methods: (i) the Autoregressive Distributed Lag (ARDL) to co-integration procedure and (ii) Granger causality, to disentangle the complicated relationships, long-run and short-run. The empirical results show that a 1 percent increase in housing prices and elderly leads to 0.52% and 1.65% decreases in birth rate respectively. Besides, both housing price and elderly dependency Granger cause birth rate in the long-run. Our findings not only shed light on fertility behaviour, but also provide implications for policy change. That is particularly relevant to those economies whose low fertility situations need to be ameliorated.

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Introduction

The secular decline of overall fertility rate has been and continues to be a major social problem (see Asher & Nandy, 2009; Demeny, 2003; Freedman, 1995; Kim, 2005; McDonald, 2006; Mulder & Billari, 2010; Odaman, 1992 to name but a few). The concern with long-term decline in fertility stems from the fact that it is the major determinant of structural ageing problem². This is in turn held responsible for the rapid ageing issue, high dependency ratio, the lack of potential consumers and labour force, and high fiscal burden of government (e.g. Asher & Nandy, 2009; Ogawa & Retherford, 1993). Therefore, it is natural that the declining fertility phenomenon is enjoying a high priority among researchers and governments, who intend to reveal the underlying reasons for the long-term low fertility and its potential solutions. Indeed, many governments are trying to reverse the low fertility rate or at least slow the trend of declining fertility with different kinds of

financial incentives (e.g. financial grants and tax breaks). However, most these efforts seem to make little achievement.

Such low fertility phenomenon has long been documented in both developed and emerging economies. Freedman (1995) reports that the overall fertility of 24 Asian countries (accounted for 3.1 billion populations) declined overall by 39% from 1965 to 1990, which represents a 62% decline towards the population replacement level of 2.1 children per woman. Another study by D'Addio and D'Ercole (2005) also notes that the Total Fertility Rate (TFR) of 64 countries is at or below the replacement level. Besides, as the United Nation points out, the projected world's average fertility would fall below the replacement rate by 2025 (The Economist, 2007). In response to the prolonged low fertility rate, the population ageing has been becoming a global issue and arising from the rising life expectancy as well as the declining fertility rate (see Hui & Yu, 2009; Hui, Li, Wong, Zheng, & Yu, 2012). According to Census and Statistics Department of Hong Kong, the elderly accounts for 13.0% (age above 65) of Hong Kong's total population in 2010. However, the Hong Kong's ageing population is expected to rocket up, as 25.3% of Hong Kong's populace will be over the age of 65 years by 2030, when the elderly dependency ratio will run up to 454 (see Fig. 1). As shown in Fig. 2, the TFR of Hong Kong slumped between 1970 and 1986 and plunged below the replacement level in 1980 (2.047). Then it stabilized and reached its lowest point in 2003.

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² As both fertility and mortality falling, the proportion of younger ages population decreases, and the proportion at older ages population increases, which is the primary cause of the structural imbalance of age composition of population and the root of heavy fiscal burden (e.g. Japan).

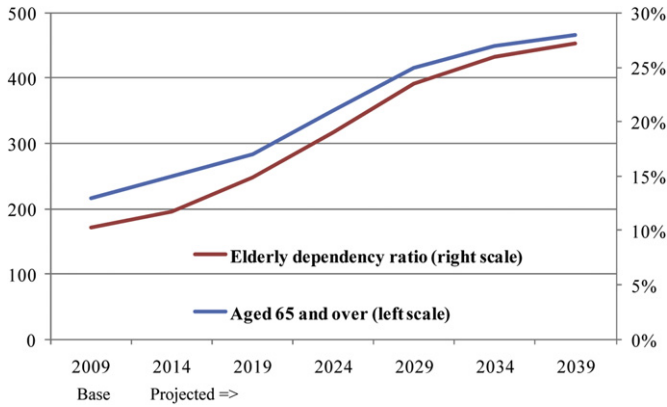


Fig. 1. Proportion and dependency ratio of elderly to the total population (source: Census and Statistics Department, www.censtatd.gov.hk).

It is traditional to explore the rapid decline of fertility from the demographic perspective; however, it seems hardly to fully explain the global low fertility problem. On the other hand, it is arguable that inefficient housing markets or/and insufficient public housing supplies will lead to high costs of establishing families and postponement of households' childbearing. Intuitively, housing price can affect household fertility behaviour in two ways. First, if the housing price is high and household cannot afford homeownership. Such obstacle to homeownership has negative effects on "couple" formation and depresses fertility behaviour (i.e. postponing of parenthood and/or limiting of having further children). Second, even if new couples are homeowners, they may be burdened by large amounts of mortgage payment. The high cost of mortgage payment may compete with the cost of bearing and raising children, which leads new home-owning couples to postpone having their first child. These naturally lead to our first testable hypothesis:

Hypothesis 1. An increase in housing price leads to a decrease in fertility level at the aggregate level.

On the other hand, a low fertility rate as well as low mortality rate has been widely recognized as the major determinant for rapid ageing. In this paper, we argue that ageing problem will in turn lead to higher elderly dependency ratio and lower fertility rate. Assume that a household is subjected to a fixed consumption limit and

facing a trade-off between expenditure of elderly caring and childbearing. If all else being equal, the household may rationally delay or limit childbearing in response to the financial pressure stemming from the increasing cost of elderly caring. Another explanation is that households are willing to reduce their other consumption (including consumption of childbearing) in order to consume more when they are retired, given a longer life expectancy (e.g. [Andreassen, 2004](#); [Yakita, 2001](#)). That is to say increasing elderly dependency erodes the incentives for childbearing. Generally, elderly dependency ratio is regarded as an integrated factor of both mortality and life expectancy. More importantly, it can also reflect economic burden stemmed from elderly problem. These lead to our second hypothesis:

Hypothesis 2. An increase of elderly dependency ratio leads to a decrease in birth rate level.

The paper is divided into five sections. The first section presents a brief background for the study. The second section reviews the literature concerning the factors influencing fertility behaviour from various perspectives. The third section discusses the sources of data and the variables chosen. In the fourth section, the methodologies of the study are introduced, followed by the presentation and analysis of the empirical results. The last section concludes the paper and discusses policy implications.

Literature reviews

The phenomenon of overall fertility declines has sparked off numerous studies to investigate mechanism and the underlying reasons for the fertility transition. For instance, [Freedman \(1995\)](#) points out that there are three essentially explanatory variables affecting fertility behaviour, namely, mortality decline, broad social and economic development (see also [Birdsall, 1988](#)), and family planning programmes. One of the populous perspectives is the linkage between demographic factors and fertility rate, especially the relationship between increasing life expectancy and low fertility rate. For example, [Yakita \(2001\)](#) finds that an increase in life expectancy tends to lower fertility rate and raises life-cycle savings. [Andreassen \(2004\)](#) finds that mortality affects fertility differently in terms of the degree of government expansion and the magnitude of human capital accumulation. Specifically, the effect of decreasing mortality on fertility transfer from positive to negative along with

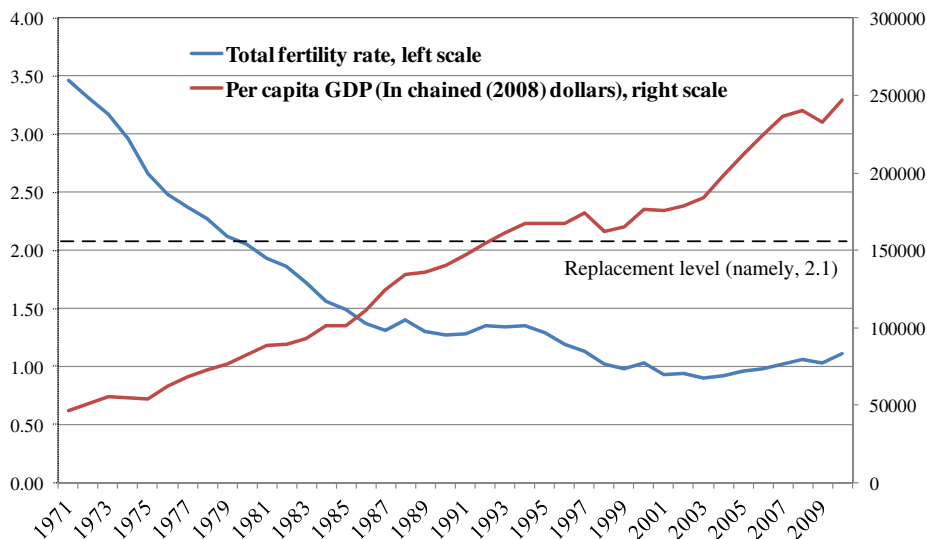


Fig. 2. Total fertility rate of Hong Kong (source: Census and Statistics Department, www.censtatd.gov.hk).

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