

UNIVERSITI PUTRA MALAYSIA

ECONOMIC ANALYSIS ON FERTILITY, FINANCIAL DEVELOPMENT, HOUSEHOLD DEBT AND FINANCIAL STABILITY

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ECONOMIC ANALYSIS ON FERTILITY, FINANCIAL DEVELOPMENT, HOUSEHOLD DEBT AND FINANCIAL STABILITY

By

ASMA' RASHIDAH IDRIS

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfillment of the Requirements for the Degree of Doctor of Philosophy

March 2019

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DEDICATION

This thesis is dedicated my father and my mother, my husband, my daughters, my sons and my friends.



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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

ECONOMIC ANALYSIS ON FERTILITY, FINANCIAL DEVELOPMENT, HOUSEHOLD DEBT AND FINANCIAL STABILITY

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ASMA' RASHIDAH IDRIS

March 2019

Chairman : Professor Muzafar Shah Habibullah, PhD Faculty : Economics and Management

The main objective of this study is to investigate the relationship between fertility and financial development and other determinants, specifically the linkages between macroeconomic variables, socio-economic factors and governance. This study is conducted in order to have a better understanding about the roles of financial development; financial depth and financial access as the effect of shadow banks system. The study covers 85 countries with data spanning for a period 2007 to 2011. As for dependent variable, we used total fertility rate as a proxy for the impact of fertility. To test for independent variables, ranging from financial development, macroeconomic, socio-economic and governance factors, we used private credit, deposit money, liquid liabilities, banking efficiency, financial openness, trade openness, female employment, human development, and last but not least, set of governance indicators; voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corrupt. Using system GMM estimator, the study provides evidence in support of previous theories whereby the impact of financial development on fertility was found to be inverse relationship which means that an increase in financial development will reduce the fertility choice. Similarly, real GDP per capita, trade openness, female employment, human development, bank efficiency, financial openness, and governance have negative impact to fertility.

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The second objective was to explore the relationship of fertility and household debt due to shadow banks system as a consequence of financial development and deepening. This is motivated by the ever increasing household debt and the failure of existing literature to show the relationship between household debt and fertility. The same GMM was used and the study suggests that the level of household debt and fertility rate are directly related, which means that an increases of number of children parents decide to have will increase the household debt level. As for other control variables; real GDP per capita, interest rate, house price and wealth, there is positive impact on household debt. Meanwhile, household debt has negative relationship between saving, inflation and unemployment.

The third objective of the thesis investigates the effect of fertility on financial stability and its determinants particularly the relevance of demographic change. This is motivated by the huge impact of demographic change (increasing ageing population and low fertility level). Population ageing and low fertility tend to lower both labourforce participation and saving rates (change bank business model), thereby raising concerns about a future slowing economic growth and financial instability. The system GMM results shows that fertility level somehow act as a buffer and reflect to the degree of stability to the financial system. An increase in fertility will contribute to lowering the financial stability. As for other two demographic variables; old population has adverse relationship to the financial stability in developed countries and youth population has direct relationship to the financial stability.

As a matter of policy implication, the nations, financial sectors and economies should take pro-active active steps and enhance policies in handling the inter-related issue of decreasing fertility, financial development, household debt and financial stability as well especially in developed countries, but not necessarily to overlook the impact of the issues in developing countries. Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

ANALISA EKONOMI TERHADAP KESUBURAN, PERKEMBANGAN KEWANGAN, HUTANG ISI RUMAH AND KESTABILAN KEWANGAN

Oleh

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Objektif utama kajian ini adalah untuk menyiasat hubungan di antara kesuburan dan penentunya, khasnya perkembangan kewangan, factor-faktor makroekonomi, sosioekonomi dan governan. Kajian ini dijalankan untuk lebih memahami lebih mendalam bagaimana peranan perkembangan kewangan: pendalaman kewangan dan akses kewangan hasil dari sistem perbankan bayangan. Kajian ini mencakupi 85 buah negara merangkumi data dari tahun 2007 hingga 2011. Untuk pembolehubah bersandar, kami menggunakan kadar kesuburan sebagai proksi kepada kesan kesuburan. Untuk menguji pembolehubah merdeka, meliputi factor-faktor perkembangan kewangan, makroekonomi, sosioekonomi dan factor governance, antaranya hutang swasta, dana simpanan, kecairan liabiliti, kecekapan bank, keterbukaan kewangan, keterbukaan ekonomi, tenaga kerja wanita, pembangunan manusia dan juga faktor-faktor governan, merangkumi kebebasan bersuara dan akauntabiliti, kestabilan politik and ketiadaan keganasan, kecekapan tadbir urus, kualiti kawal selia, pengurusan akta dan undang-undang dan pengawalan rasuah. Dengan menggunakan analisa system GMM, hasil penemuan kajian ini mencadangkan perkembangan kewangan berhubung secara songsang dimana ia membawa maksud peningkatan dalam perkembangan kewangan akan mengurangkan kesan kesuburan. Manakala, pendapatan per kapita, keterbukaan ekonomi, tenaga kerja wanita, pembangunan manusia, kecekapan bank, keterbukaan kewangan dan governan juga berhubung secara songsang terhadap kesuburan.

Objektif kedua adalah untuk meninjau hubungan jangka panjang di antara kesuburan dan hutang isirumah didorong oleh sistem perbankan bayangan berpunca daripada perkembangan kewangan and pendalaman kewangan. Peningkatan hutang isirumah dan kegagalan kajian yang sedia ada untuk mengambil kira hubungan diantara hutang isirumah dan kesuburan. Penganggaran GMM yang sama digunakan dan kajian membuktikan hubungan jangka panjang diantara hutang isirumah dan kesuburan adalah relevan dengan menunjukkan interaksi positif bermaksud penambahan bilangan anak akan meningkatkan hutang isirumah. Untuk hasil penemuan kajian bagi pembolehubah lain seperti pendapatan per kapita, kadar interest, harga rumah, harta, keputusan tersebut menyokong dan interaksi positif dengan hutang isirumah. Sebaliknya, simpanan, inflasi dan kadar pengangguran mempunyai hubungan songsang dengan hutang isirumah.

Objektif ketiga tesis adalah untuk menkaji kesan kesuburan ke atas kestabilan kewangan dan factor-faktor penentu terutamanya faktor perubahan demografi. Kajian ini didorong oleh impak perubahan demografi yang besar iaitu peningkatan kadar golongan warga emas dan penurunan kadar kelahiran. Ini boleh menyebabkan mengurangkan kadar penyertaan tenaga buruh dan kadar simpanan (menukar model perniagaan bank), dengan itu menimbulkan kebimbangan mengenai pertumbuhan masa depan ekonomi yang perlahan dan ketidakstabilan kewangan. Penganggar system GMM menunjukkan tahap kesuburan adalah satu faktor penentu yang mempengaruhi tahap kestabilan sistem kewangan. Peningkatan tahap kesuburan akan menyumbang kepada ketidakstabilan kewangan. Manakala, dua pembolehubah merdeka yang dianggap pembolehubah penting iaitu golongan warga emas dan belia berhubung secara songsang dengan kestabilan kewangan. Ini bermaksud peningkatan warga emas and belia akan menyebabkan indeks kestabilan kewangan menurun.

Sebagai implikasi dasar, negara, sektor kewangan dan pakar ekonomi perlu mengambil tindakan pro-aktif dan menambakbaik polisi dalam mengendalikan isu-isu seperti pengurangan kadar kesuburan, pemkembangan kewangan, hutang isirumah dan kestabilan kewangan terutamanya di negara-negara maju, dalam masa yang sama tidak mengabaikan kesan isu-isu ini di negara membangun.

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CHAPTER 1

INTRODUCTION

1.1 Background

Fertility behaviour and financial development have seen intense changes in recent decades, as both demonstrated distinctive patterns. Worldwide, financial development has upgraded the conceivable credit and intertemporal trade for households and firms; fertility has revealed an unmistakable descending pattern, which is alarming. The declining fertility rate is expected to be soon experienced by many nations, especially among developed nations (Adserà, 2004). The well-developed financial system supports firm accessibilities to credit market and encourages production efficiency while contributing to salary rise in wages in the modern market. This often provides parents with the opportunity to work in the modern sectors (high wages, low fertility rate) instead of retaining traditional sector (low wages, high fertility rate). Figure 1-1 shows the negative association between fertility and financial development in high income, upper middle income, lower middle income, and low income countries between the years 2000 to 2011.

Very often, the direct and indirect effect of economic growth and the increase in the number of female labour force in the financial sectors cannot be denied. Achievement in education and employment has changed females' social status and empowerment (Abdullah, Bakar, and Abdullah, 2013; Al-Qudsi, 1998; Bernasek, 2003; Feyer, Sacerdote, and Stern, 2008; María, Rocha, and Fuster, 2003; Upadhyay and Karasek, 2012). Based on time series analysis in Croatia, higher education among women significantly and positively influenced female





Sources: Private credit; Global Financial Development Database, World Bank, fertility rate; WDI, World Bank.

Notes: **Private credit**: private credit by deposit money banks and other financial institutions to GDP (Other financial institution measuring non-bank financial institutions which provides financial services similar to traditional banking financial services), **Fertility**: total fertility rate (total birth rate per women) represents the number of children that would be born to a woman if she were to live to the end of her childbearing years.

participation in the labour force, resulting a greater negative impact on the fertility rate (Obadic, Cipin, and Pripuzic, 2007). In addition, family planning policies by governments of certain countries could be the reason for reduced fertility (Ezeh, Mberu, & Emina, 2009). Overall, a combination of these factors promptly decreased fertility rate in many countries, particularly among developing and developed countries.

Within the previous years, many countries experienced a rapid increase in household debt¹ in both absolute terms and relative to the size of economy due to rising income and household demand for goods and services. Figure 1-2 shows the increasing trend of household debt in selected developed countries for 2005, 2007 and 2013 where the highest rate is identified to be Netherland followed by Norway, Australia and Switzerland. In recent years, very rapid growth of households' outstanding debt is considered a major economic worry, especially in developed and developing countries since the 2007/2008 financial crisis. Between 2002 and 2007, the ratio of household debts in advanced countries to increased drastically from 39 per cent to 138 per cent (IMF, 2012a). This has been a concern of many countries since it can have a substantial adverse impact on macroeconomic performance and stability. For example, it may delays the ability of smooth household consumption as well as negatively impact corporate investment.

Apart from countries' economic growth and development in various sectors, financial development and financial deepening have played vital role in easing household access to credit from the banking sectors. Worldwide, a growing shadow banking system have

¹ Household debt can be defined as a subset of liabilities that the household owe financial institutions. Generally, debt is known as all liabilities that require payments of interest or principal by the debtor to the creditor at dates in the future. Liabilities predominantly consist of personal loan debt, investment debt, investment loan debt, credit card debt, vehicle loan debt, property loan, home loan debt and other consumption loan debt. The largest component of household debt is housing loan debt in most of the countries.



Household debt in developed countries



Note: household debt/disposable income ratio

expanded credit availability and accessibility to households and businesses (Pozsar, Adrian, Ashcraft, and Boesky, 2013) as credit is a vital source of income for the household and a source of capital for firms. Recently, the issue of shadow banking has been associated with the rising of household debt worldwide. The size of the global shadow banking system has grown to over USD67 trillion from close to USD26 trillion about ten years ago, accounting for nearly half of the size of the worldwide financial system (ECB, 2013). The numbers show accelerated growth of shadow banking industry. Shadow banking activities have also shown an abrupt growth in recent years among high-income countries, especially France and Spain.

An assessment on shadow banking illustrated by Ashcraft and Adrian (2012) demonstrates the gradual decline of the traditional funding sources of the commercial bank in the form of deposits, and the relative increase in market-based funding sources offered by other financial institutions from 1945 to 2011.

Fertility decision certainly concern depend on the household income and cost of childrearing. The rising cost of living and childrearing encourages borrowing, which then leads to the increase of household debt (Banerjee and Duflo, 2007). Becker and Lewis (1973) presented a model in where parents think not only about the quantity of children that they have, but also the quality of those children. The quality of children has been identified to be linked to the children's consumption possibilities and human capital accumulation (Becker, Murphy, and Tamura, 1990; Córdoba & Ripoll, 2012). It is practical for parents to be concerned about their own human capital acquisition when forced to take debt to endorse their children's educational needs and emphasising on the quality of children. As debt basically diminishes the available resources which can be distributed to the children, it may influence the fertility decision through a trade-off between debt and the desired child quality, or quantity.

Therefore, the question arises whether financial development and household debt are simply demonstrating spurious temporal correlation on fertility or possibly one causes the other? Financial development and household debt are possible determinants that may influence fertility behaviour.

Another concern regarding the declining fertility is its impact on financial stability. The implications of declining fertility rate are profound as they disturb the global age structure. Combined with the dynamic evolution of past birth and death rates, a recent decline in fertility rates and increase in life expectancy are profoundly changes the global age structure. Increased life expectancy has risen the ageing population or elderly dependency ratios in the world population. It is approximated that the amount of individuals above 60 years old will be 1 billion by the year 2020 and 2 billion by 2050, which equates to 22 per cent of the global population. Between today and the year 2050, the ratio of people above 80 years old is anticipated to increase from 1 per cent to 4 per cent of the worldwide population (Bloom, Canning, & Fink, 2011).

Figure 1-3 illustrates the increasing rate of ageing population from 2005 to 2010 in developed and developing countries. Surprisingly, the projected data on dependency rate (old-age population and young-age population) for developed countries is more than the rate of youth (working-age population) in 2030. Youth are the highest taxes contributors. However, they have decreased in number since 2005 and they are further expected to reduce the next few decades. The high level of dependency rate may increase countries' expenditure on health expenditure, pension funds and child-rearing. Meanwhile, in developing countries, the dependency rate decreased as the estimated rate of the young-age population becomes smaller. This young-age population will become youth in the future, and a few decades later, developing countries will face a lower rate of working-age population.



Figure 1.3 : Old, young and youth for selected developed and developing countries in 2005, 2010, estimated 2020 and 2030

Source: World Development Indicator (WDI), World Bank and United Nation Database.

Note: Old: Old dependency ratio, people over 64 relative to the working population between 15-65 years. Young: Young dependency ratio: people younger than 15 relative to working population between 15-65 years. Youth: Working population ratio: people employed more than 15 years relative to total population.

Demographic transition studies have become enormously popular since the late 1990s. Known as the population age structure; it defines a population's age distribution.² The emergence of age structure occurs throughout the demographic transition of a population. The population penetrates the demographic window when a sequence of a mortality decrease is observed. Throughout this timeframe, the total dependency

 $^{^2}$ Usually, it is measured by the total dependency ratio (ratio of the total number of the dependent population, aged below 15 and above 65 years, to that of the working-age population). The ratio of the dependent population number under 15 year-old to that of the working-age population is referred to as the youth dependency ratio, while that of the dependent population above 65 year-old is referred to as the elderly dependency ratio. Lower the dependency ratio is parallel to a less dependency burden to a particular economy.

ratio prominently diminishes due to lower youth dependency level. Similarly, the ratio of the working-age population turns out to be conspicuous in the total population, resulting in adequate labour supply to the economy and accumulated savings for investment. The deviations in demographic structure throughout the demographic window may be boosted with the implementation of suitable economic and social policy environment (Bloom and Williamson, 1998). However, when the working-age group reaches 65 years old and above, which is higher than the number of dependent youths who shifts to working-age population, it, in turn, affect the country's labour supply, saving accumulation, productivity and economic growth.

From the late 1990s, research that investigates demographic dividend has received a great deal of attention. Bloom, Canning, and Malaney (2000) addressed that demographic dividend represented astonishing development in East Asia between 1965 and 1990. Bloom et al. (2006) discovered that economic take-offs in India and China have significantly benefited from the variations in their demographic structures all through the demographic transition.

Bloom, Canning, and Fink (2007) examined the capacity of Sub-Saharan African nations to reach their planned demographic dividend if the policy and institutional context are well-suited. Nevertheless, after several decades, the baby boomers shifted towards an ageing population, and this cohort increased in numbers as compared to the actively working young population. This has become alarming as young population are among the major economic agents, which contribute to the countries' productivity and economic growth.

Nevertheless, there has been a marked increment in demographic changes studies by looking at the number of studies being conducted. Existing literature on demographic studies emphasised investigating the effect of ageing population to the economic growth (Bloom et al., 2011; Wei and Hao, 2010), pension (Bielecki, Goraus, Hagemejer, and Tyrowicz, 2015), saving (Epure, 2012) and fiscal challenge (Muhleisen and Faruquee, 2001). Currently, available literature utilises the interjurisdictional difference within a nation, which then creates a gap to bridge. Therefore, this study attempts to add value to the literature by observing a wide range of countries' data. The research also concentrates on the effect of fertility behaviour (one of the important demographic factor) on financial stability; an issue which still lacks in information.

The demographic transition effect on financial stability is still not a well-discussed issue in the economic literature especially the effect of fertility on financial stability. The predicted effect of demographic transition, declining fertility and smaller young cohort can influence financial institutions business model by pressuring banking institutions on demands for loans and deposit (saving). The saving behaviour of households directly affects credit institutions' activities and profitability by influencing the assets and liabilities of banks' balance sheets. On the asset aspects of banks' balance sheet, the shrinking proportion of young customers will reduce the household demand for loans, for example borrowing for consumption. On the liability aspect of the banks' balance sheet, the old-age population will favour the development of a new long-term saving product which demands households to save first up to retirements and finally proceed to dissaving.

According to the theory of asset meltdown hypothesis, an increase in the proportion of pensioners to the total population triggers a decline in asset prices. Pensioners, being unproductive agents, dissave during their old age. Therefore, there might be fewer economically active individuals who act as buyers in the capital markets (Schich, 2008). In this case, many governments provide tax incentives and subsidies to raise the conversion of long-term savings into annuities at retirement age. However, the empirical evidence for a historical correlation between demographic change and asset market prices is not clear. A work done by Engelhardt and Poterba (1991) could not identify whether demographic had a similar influence on asset prices as identified by Mankiw & Weil (1989) and Schich (2008). The result showed a statistically insignificant and, in most cases, negative association between demand and house prices in Canada. This suggests caution is required when extrapolating the historical trends of the United States of America to the next century, while also illustrating that significant real declines in house value are not impossible.

In fact, many countries experienced lower population growth which resulted from decreased fertility rate and a smaller rate of young cohorts. This might increase the competitiveness of banks to secure new customers by increasing the acquisition costs per customer. In the meantime, banks should be aware of the competition for existing customers due to the aforementioned trend of the shadow banking which increases the customer retention cost and higher marketing expenditure that leads to cause pressure on cost and efficiency, which is significant for banks to keep a sound cost-income ratio. In addition, banks may take more competitive strategies to maintain their revenue and growth which might put pressure on interest margins. The downward pressure of on interest margins could contribute to a negative impact on interest receivable and payable as well as net interest income in the profit and loss account. Consequently, banks may expand their services internationally in order to penetrate emerging market. However, this strategy could expose banks to the increased exchange rate and political risk. On the other hand, demographic changes can influence bank's long-term interest rate by flattening the yield curve. This negatively affects banking profit by decreasing revenue from liquidity and duration transformation by affecting interest margins over fixed costs. Again, the net income interest in the profit and loss account will be negatively influenced. This factor would reduce bank stability by increasing the exposure to shocks or whenever banks adapt to the new environment. Therefore, based on aforementioned literature which is still lacking, another question arises in our study; does fertility really matter to financial stability?

Due to insufficient evidences, these unanswered questions motivated the development and progress of this study, which aims to provide a complete explanation of the relationship between credit availability and households' fertility decision, taking into consideration the shadow banking system, to extent does household debts' influences fertility decision due to non-banking intermediation, further and also on the possibility of the declining worldwide fertility worldwide to become a threat to the stability of banking sectors.

1.2 Stylized Fact

1.2.1 Overview of World Fertility Rate

Fertility rate can be defined as a measure of fertility that indicates the average number of children born per women over her lifetime. Global fertility rates are in general declining and current forecasts show a decrease in fertility levels globally³. This trend is most pronounced in industrialised countries, especially in Western Europe, where the population is projected to decline dramatically over the next 50 years. Achievements in education, employment, and living standard, combined with intense break-through in health and family planning technology, have led to lower fertility in every country. It has been found that decline in the passion for large families is a requisite for the decline in fertility (Pritchett, 1994). The total fertility rate (TFR) for the world remained at around five children per woman in the 1960s but it has declined dramatically from 4.98 in 1960 to 2.48 in 2011 (Figure 1-4). In 2015, the total fertility rate is 2.5 children per woman globally (United Nation, 2015). It is expected to be around or below 2.0 by 2050 (Ovseiko, 2007). Among the developed countries, the average number of children per women over her lifetime has decreased from 2.67 between 1960 and 1965 to 1.64 from 2005 to 2008 which is almost below-replacement level. Meanwhile, the amount in least developed nations has deteriorated from 6.73 to 4.39 (Filoso & Papagni, 2011)

Although the decline in fertility is seen as a global phenomenon, the pace of the decline, however, varies widely. In some part of the world, fertility has continued to decline faster than in others. Fertility levels dropped slightly in low-income countries where the TFR still exceeds five children per woman from 1960 to 2008. Meanwhile, in the 1960s, fertility was noticeably low in high-income countries; currently, the TFR is below replacement level⁴. The highest fertility rate was observed among low-income countries, while the lowest rate occurred in high-income OECD. In high-

³ It is highly important to have a clear knowledge of a country's current fertility rate and of the possible increasing or decreasing future patterns. Sustained high or low fertility rate can lead to unbalanced age structure within the population producing economic and infrastructural pressure for providing necessary services and financial support to the over presented age group.

⁴ Replacement fertility is total fertility rate at which women give birth to enough babies to sustain population level. The replacement rate is roughly 2.1 births per woman for most industrialised countries but ranges from 2.5 to 3.3 in developing countries because of higher mortality rates. Taken globally, the total fertility rate at replacement is 2.33 children per woman.

income non OECD countries, high-income OECD, and upper-middle income, the TFR is currently below the replacement level (Figure 1-5).



Figure 1.4 : Trends in World Total Fertility Rate (TFR) in 1960-2011 Source: World Development Indicator, World Bank



Figure 1.5 : Total fertility rate (TFR) by income group (1960-2012) Source: World Development Indicator (WDI), World Bank.

1.2.2 Trends in Financial Development

The pace of the growth in financial development varied broadly across the countries. It has continued faster in some parts of the world than in others. Private credit by deposit money banks and other financial institutions (PRIVCRED)⁵ is referred as a proxy of financial sector development which demonstrates an expanding pattern for all countries from 1990 to 2011. The PRIVCRED level has increased marginally in every country except it outlines a rapid increase in high-income OECD countries. The highest level appeared in high-income OECD countries, and the lowest level was seen in low-income countries (Figure 1-6).



Figure 1.6 : Private credit by deposit money bank and other financial institutions to GDP (%) in 1990-2011

Sources: Global Financial Development Database, World Bank (www.worldbank.org/financialdevelopment)

⁵ Private credit by deposit money banks and other financial institutions to GDP (Cihak, Demirguc-Kunt, Feyen, and Levine, 2012).

1.2.3 Overview of Household Debt

The global household debt-to-GDP ratio barely raised over the past 10 years, from just less than 60 per cent in 2008 to 62 per cent in 2017. During this period it dropped to less than 56 per cent in 2014 before rising again (Cochrane, Ell, and Korobkin, 2019). Many economies have experienced a dramatic increase in household debt over the past decade, leaving them vulnerable to future shocks and threats. Several international organisations and central banks in many economies have warned against the risks to economic growth and financial stability of the massive household debt worldwide especially in most developed and developing countries. Most of advanced economies, the accumulation of household debt has been influenced by the ease of access to credit resulting from financial deregulation in the 1990s and historically low interest rates post global financial crisis (GFC) that largely helped to offset debt service costs against larger loans outstanding (Debelle, 2004).

In developed countries, for example, Australia is facing the most serious household debt problems. The household debt to GDP ratios in Australia is not only much higher than other economies, but also rising, which places the country at risk. While many other developed countries have seen a decline of personal debt since 2008 global financial crisis, Australia's debt levels have continued to increase, where Australia is now reported to have some of the highest personal debt levels in the world. In fact, the ratio of household debt to income has more than doubled between 1995 and 2015, going from 104% to 212%. Surprisingly, the average person earns \$80,000, however they are spending \$169,000 per year (OECD, 2017). Norway, Switzerland, Denmark, Netherland and Canada are among those that not only have the fastest-rising household debt-to-GDP ratios, but also the highest ratios as well. Most emerging markets have much lower debt to GDP ratios than developed economies. But in some cases, total debt has risen quickly in Chile, Brazil, Turkey and Saudi Arabia. However, it indicates rising risks in Asia, as South Korea, Hong Kong and China have the highest household debt-to-GDP ratios in the region (Cochrane et al., 2019).

In developing country, for example in Malaysia, Bank Negara's report presented the household debt raised at RM1.18 trillion in 2018, of which residential housing loans accounted for 53.2% or RM628bil of total household debts while the remaining 46.8% were for personal consumption expenditure including motor vehicles, credit card and personal finance. The central bank had notified a growing number of defaults in personal financing. It emphasised half of total outstanding personal financing was held by borrowers with monthly income below RM5,000 and they mostly used it to funding high standard of living cost and lifestyle choices. Some households were showing signs of difficulty in servicing their debt, especially among low-income borrowers with personal financing, and borrowers with larger housing loans above RM500,000 and who are more dependent on variable income sources. However, households income below RM3,000 per month remained vulnerable, with their low financial buffers (BNM, 2018).

Main driving factors of the heavy household debt are raising non-banking financial institutions (NBFIs) which offering similar borrowing instruments as provided by traditional banking sector with low interest rates (Debelle, 2004), housing price boom (Meng, Hoang, and Siriwardana, 2013), low income level (Abid and Mohd Shafiai, 2018) and for the purpose of current consumption due to high cost of living, childrearing and expenditure (Alias, Azmi, & Mohd Yusof, 2018; Anderloni, Bacchiocchi, & Vandone, 2012). Household aim to own home and continue to repay on products such as car loans and credit cards (Abid and Mohd Shafiai, 2018).

1.2.4 Roles of Financial Development, Shadow Bank System and Household Debt

In general, a solid and sound financial system facilitates faster, inexpensive and secure transactions as it escapes the cash and barter system. Greater access to financial services assists the household in planning for the future as well as contributing to investments. More investment and accumulation of financial assets can stimulate more incomes which helps to pay for family expenses and childrearing. Insurance protection and saving services can help households to cope with economic shocks and significantly reduce unexpected circumstances such as natural disaster, disease or death: subsequently lessening the risk of falling into poverty. Financial development also prompts to economic growth and higher income per capita, which in turn further enables greater investment and more productive allocation of capital. Progressive and sophisticated financial markets discriminate less and provide funding to those with attractive investment opportunities. Overall, financial development certainly spurs income growth (Levine, Loayza, and Beck, 2000) helps reduce poverty (Honohan, 2004) and gender inequality while increasing available opportunities. Female, for instance, have more access to financial services to gain income and support family expenses. Such opportunities contribute to the changes in women role and their empowerment in the society.

As financial development spreads worldwide, the possibility for credit availability and accessibility are broadened for households and firms: encouraging them to borrow more. Excessive borrowing may weaken the balance sheets and expose households to various shocks. Households may face cash-flow problems, loan default, insolvency and foreclosure. For several decades, the issue of shadow banking⁶ has been significant worldwide as it increases households' debt due to higher rate of lending activities. Shadow banking activities also showed a sharp growth over the recent years, especially in developed and developing countries. Shadow banking system triggered a global financial crisis that worsened business and financial cycles in the financial system.

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⁶ The shadow banking system can be defined as a system comprising non-bank financial institutions (NBFIs) that facilitate credit intermediation process. They provide services similar to traditional commercial banks which compete with the banks in lending money to the public. NBFIs which existed decades ago to complement the traditional banking system are the major source of systematic risk to the financial system as a source of credit and liquidity in the economy (Dudley, 2009).

Rising household debt has been one of the most enduring and widespread economic trends for the past 30 years. A number of developments particularly financial sectors which have worked to increase both demand and supply of household credit over the past few decades. In 2000s, nations such as Australia, Malaysia, Korea and other nations in Asia and the pacific have experienced a spike in household debt and the increased share of household loans to total loans of financial institutions. The International Monetary Fund and World Bank are among some of the international organisations that have warned some countries in Asia especially Malaysia over the high level of its household debt. As the current economic environment shifts and central banks starting to tighten cycle amidst a highly uncertain global economy, many countries in the region, especially in developed and developing economies, may well be facing a new financial crisis due to high level of debt (ICAEW, 2014).

In addition to shadow banking and deepening of the financial sector, credits are available and highly accessible for households. This has led to an increase in the amount that households borrow. Three acknowledged reasons for the increase of household debt are: the surge in households' demand for loan due to positive economic growth, low interest rate and urbanization, the rise in the accessibility of household lending of financial institutions from financial innovations and industrial and technology improvements; and government policies that encourage household borrowing and consumption (Ma, Remolona, & Shim, 2009).

The availability of credit and easy access to financial sector further increases opportunities and encourages households to borrow. Household debt is a burden, as it reduces the monthly portion of income and purchasing power to consume. Although expansion in the level of household debt is viewed desirable for enhancing growth and for smoothing consumption for family and children, excessive household indebtedness poses a significant threat and risk to the household balance sheet (Ma et al., 2009). The condition has become worse now as the (Ebenstein, Hazan, and Simhon, 2011). Fertility is also placed under pressure during the economic recession due to rising risks of unemployment and job instability which particularly affect young adults. Lesser wages and minimal job opportunities and their tighter expenditure decreases couples affordability of having kids (Goldstein, Sobotka, & Jasilioniene, 2014). Becoming parents and decisions to have more children are irreversible commitments, especially financing the costs of rearing children. This scenario proves that it is not a good solution for parents to borrow for their children' expenditures.

In many high-income and developing countries, housing loan debt constitutes the largest portion of a household debt, followed by vehicle loans, consumer loans, securities purchase and credit cards. In several countries, the central bank has claimed that household debts are still controllable due to progress in income, high saving levels and positive job opportunities. But, if the household debt is observed from the point of disposable income, then it is stressful. This is because it releases it liquidates approximately 50 percent of the household's income to settle their debts. In fact, the debt to income ratio has increased substantially for the past several decades and is expected to continue to rise in coming years. Nevertheless, it is also believed that the

rising of indebtedness will not transpire, as high-interest rates, lower income growths and ageing population would tend to reduce aggregate borrowing.

Most analysts believe that the high household default sparked the financial crisis and the economic downturn, and also capable of producing financial catastrophe. Mian & Sufi (2011) stated that one of the striking features of the US economic downturn in 2007 was the preceding largest household debt increase in recent history. Downturns were harsher when headed by huge household loans (International Monetary Fund, 2012), economic deterioration and high non-performing loans (NPL) leading to an overall economic shock (Cecchetti, Mohanty, & Zampolli, 2011). Furthermore, the consequence of economic downturn on fertility regularly advocates the knowledge that fertility responds negatively to recession in the business cycle (Ogawa, 2003). Economic recession and uncertainty tend to increase unemployment rate and reduce the income earned by household. Rising unemployment is the result of male unemployment looks like to be mainly vital, possibly in accordance with the ongoing salience of male income for family formation. In a cross-country comparison by D'Addio & D'Erdole (2005) unemployment negatively correlated with the total fertility rate in Europe since the mid-1990s. Low levels of household wealth significantly and positively influence the decision to postpone attempting a first child. The chances of further childbirth were also significantly and negatively influenced by household income insecurity (Modena, Rondinelli, and Sabatini, 2014).

1.2.5 Overview of Demographic Change

Since the late 1990s, research on the demographic change has gained significant attention from economist and researchers. Demographic structure is known as population age structure as it describes the age distribution of a population. Usually, it is measured by the total dependency ratio (ratio of the total number of the dependent population, aged below 15 and above 65 years, to that of the working-age population). The ratio of the dependent population number above 65-year-old is referred as the elderly dependency ratio. On the other hand, for under 15-year-old, the working-age population is referred to as the youth dependency ratio. Lower dependency ratio is parallel to a less dependency burden to a particular economy.

Most countries will experience substantial demographic shifts in these coming decades due to changes in fertility, life expectancy and migration. The increasung rate of old aged population is an issue of concern and is being investigated seriously. Globally, the number of people over the age of 60 is projected to grow by 56 percent, reaching to 1.4 billion by 2030 and nearly 2.1 billion by 2050, representing more than double its size in 2015, which is 901 million. There were 607 million old-aged people in 2000 with an increase of 48 per cent (Figure 1-7). Meanwhile, the more developed regions showed slower growth of older population aged 60 year or over, whereby, the number grew from 231 million to 299 million between 2000 and 2015, which is a 29 per cent growth. Over the next 15 years, this number is anticipated to grow by 26 per cent to approximately 375 million in 2030. On the other hand, the growth rate of old-aged population is accelerating in developing regions. In less developed regions, the

number of old-age population increased by 60 per cent, from 376 million in 2000 to 602 million in 2015, and it is projected to achieve 1 billion people aged 60 years or over, which increased by 71 per cent between 2015 and 2030 (Figure 1-7). Surprisingly, the projections show that 1.7 billion old-age population, which is approximately 80 per cent of the world's older population will settle in less developed nations (United Nations, 2015).

By region, according to the projections, Asia showed the highest old aged population by 2030 which is more than half of the world's oldest-old persons, amounting to 508 million in 2015 at 59 per cent growth rate from the year 2000, followed by Europe, Latin America and the Caribbean, Africa, Northern America and Oceania. By 2050, the highest projection growth of old population is Latin America and the Caribbean with 70.6 per cent and is trailed by Asia (66.3 per cent) and Africa (63.5 per cent) (Figure 1-8). The high growth rate of old-age population is due to the high fertility rates 80 years prior and the increased longevity as a result of improved expenditure and health care.





Figure 1.7 : Old-aged population (60 years or above by development group, 2000, 2015, 2030 and 2050

Source: United Nations (2015) World Population Prospects: The 2015 Revision Note: Old-aged population 60 years or above (millions) over total population



Figure 1.8 : Old-aged population (60 years or above by regions, 2000, 2015, 2030 and 2050

Source: United Nations (2015) World Population Prospects: The 2015 Revision Note: Old-aged population 60 years or above (millions)

By income group, the fastest growth of old-age individuals was observed in uppermiddle-income countries between the year 2000 and 2015, and this cluster is predicted to demonstrate the fastest growth in another 15 years. In 2015, it was calculated that there are 320 million people aged 60 and above in upper-middle-countries. This is an increase of 64 per cent from the year 2000. Meanwhile, the number of old-age individuals is expected to rise by 70 per cent from the year 2015 to approximately 545 million people (Figure 1-9). By 2050, from the four income groups, the number of old-age population is anticipated to increase most fastest in low-income countries up to a total of 51 percent of oldest-old persons in the world with 114.8 million, followed by low-middle income countries up to 47 percent with 692.5 million (Figure 1-9). The reason for the high old-age population in low-income countries is because the upcoming cohorts of the old population were born during high fertility around the mid of the twentieth century.



Figure 1.9 : Old-age population (60 years or above by income group, 2000, 2015, 2030 and 2050

Source: United Nations (2015) World Population Prospects: The 2015 Revision Note: Old-age population 60 years or above (millions)

1.2.6 Demographic Changes and Financial Stability

The market's growth is determined by the growth of GDP per capita, population and the changes in the banking intermediation. It is claimed that demographic changes might have a negative impact on GDP per capita. Besides, the population rate will decrease and even turn negative due to decreasing rate of total fertility rate. Demographic change is likely to affect the banking intermediation ratio due to growing non-banking financial intermediaries such as insurance companies, investment funds and pension funds. This indicates that demographic change is probably gives strong pressure on the demand for banking institutions; in the form of loans and deposit. Banks may take more competitive strategies to maintain their revenue and growth which might put pressure on interest margins. The downward pressure of on interest margins could contribute to negative impact on interest receivable and payable as well as net interest income in the profit and loss account (Imam, 2013). Consequently, banks may expand their services internationally covering emerging market, and this strategy could expose banks to increased exchange rate and political risk (ECB, 2006). In addition, many countries experience lower population growth as the consequences of decreased fertility rate and a smaller rate of young cohorts. Under such circumstances, banks increase their competitiveness to secure new customers and increase acquisition costs per customer. In the meantime, bank should be aware of the impact of competition on existing customers. The aforementioned trend of the shadow banking often increases the customer retention cost and higher marketing expenditure that leads to higher pressure on cost and efficiency, making it important for the bank to keep a sound cost-income ratio (Chikada et al., 2012).

Demographic changes can influence bank's long-term interest rate by flattening of the yield curve that gives a negative effect on banking profit. This is attainable by decreasing the revenue from liquidity and duration transformation by affecting the interest margins over fixed costs. Again, the net income interest in the profit and loss account will be negatively influenced. Therefore, this factor would reduce bank stability by increasing exposure to shocks or whenever banks adapt to the new environment (Imam, 2013).

The balance sheet of banks is closely connected to the life-cycle of consumers' behaviour and organizations, with liabilities and assets thoroughly mirroring the evolution of households' balance sheet. Hence, excess liquidity is obtained by banks from a comparatively huge, stable and rising deposit base originating from the wealthy old-age population, as approximately 60 per cent of household savings are seized in deposits. The decline in credit demand echoes reduction in labor-capital ratio, as the number of employees retiring is larger than the number of employees entering the workforce. Also, older people do not borrow for housing debt or durables goods, and firms not demand more credit in a shrinking market. Rising shares of firms have ceased borrowing. This has brought about remarkable low loan to deposits ratio. This recommends that the gap between the demand for credit and the supply for saving, known as liquidity trap may be caused driven in large part by demographic changes (Imam, 2013).

Another impact of the demographic change is saving behaviour of household that directly affects credit institutions' activities and profitability by influencing the assets and liability side of banks' balance sheets. On the asset side of banks' balance sheet, the shrinking proportion of young customers will reduce demand for loans to household, for example borrowing for consumption. On the liability side of the banks' balance sheet, the old-age population favours the development of new long-term saving product which demands households to first save up to retirements and then turn to dissaving. In this case, many governments have been observed to provide tax incentives and subsidies to raise the conversion of long-term savings into annuities at retirement age (Chikada et al., 2012; Fanti & Spataro, 2013; Bielecki et al., 2015). This limits the ability of fiscal policy of the government, owing to the demand for increased health care expenditure and welfare for the old-age population during their retirement age (Faruqee & Muhleisen, 2003; Tosun, 2008)

The effect of demographic changes on financial stability is commonly discussed in the economic literature. According to the theory of asset meltdown hypothesis, a surge in the proportion of pensioners as percentage of the total population triggers a decline in asset prices as pensioners are unproductive agents who dissave during their old age. Therefore, there might be fewer economically active individuals who act as buyers in the capital markets (Schich, 2008).

1.3 Problem Statement

A well-developed financial system facilitates firms' accessibility to the credit market, enhanced production efficiency, and promotes wage increase in the modern market. Parents have the choice of moving from the traditional market (high fertility rate, low wages rate) to work in the modern sector (low fertility, high wages rate) (Habibullah, Farzaneh, and Haji Din, 2016) (Varvarigos and Arsenis, 2015). The development of the financial sector and financial deepening has however resulted in shadow banking becoming an important issue (FSB, 2016). Advancement in businesses and rising household debt due to a higher rate of lending activities provided by non-financial banking institutions has become a concern in several developed and developing countries (Gallin, 2013; Konno, Teramoto, and Mera, 2011).

The approach to fertility in this study is quite different. Traditional societies often treat fertility endogenously, but we believe fertility has a close relationship with external cause (exogenous) other than its own. The standard framework of endogenous by Leibenstein (1957), Becker (1960), Robinson and Horlacher (1971), Becker and Barro (1988) and Barro and Becker (1989) mentioned that parent value the number of their offspring (quantity) as well as their future human capital (quantity). Fundamental contribution of Becker has been followed by the major improvement of Galor et al (1999, 2002), Cigno and Rosati (1992, 1996,1997), Lehr (1999), Basso et al. (2014) and Filoso and Papagni (2015) whereby generate model with exogenous fertility. Thus, in this study, a wider approach was applied by incorporating the interrelationship between financial development, socio-economic and macroeconomic condition, governance and fertility which emphasized the exogenous variables. The variation between these variables and its influence on fertility were also considered. Declining fertility results in a massive and significant impact as it not only disturbs demographic development, but also causes a long-term effect on the shortage of workers, productivity growth, and population growth. Several theories have been proposed to describe fertility behaviour (Cigno and Rosati, 1992, 1996; Lehr, 1999; Faruqee and Muhleisen, 2003; Billari and Galasso, 2009; Filoso and Papagni, 2010; Fanti and Spataro, 2013; Basso et al, 2014). Nevertheless, comprehensive research specifically on the relationship between fertility, financial development and household debt has yet to be thoroughly studies. The effects of shadow banking and household debt on fertility are often considered on a broader basis by relating it to the quality of life for citizens. Although fertility and financial development often emerge as a priority in global policy agendas and research in this lack of consensus among policymakers or scholars. Hence, arises the need among researchers to discover new findings in this field. An additional significant element is the ambiguity and

uncertainty in the empirical research of fertility economics. The gradually declining fertility and its determinants are deafening and holistic should be explored in a wider scope.

In addition, the issue of cost of raising children has been concerned by researchers in many nations (Ahmad Khan, Abdullah, and Samsudin, 2016; Beecham, 2006; Kim, Engelhardt, Prskawetz, and Aassve, 2009; Werding, 2014). The Becker's idea that quality children (human capital) are investment goods (as perceived and demanded by parents) are subject to a large variety of parental "investments" in children (Becker, 1960a) such as monetary expenditure on food, clothing, shelter, health and medical care, child care to provide for a higher living standard of each child and support them in obtaining a better education. The children expenses certainly depend on level of socio-economics status, lifestyle and economic affluence of the parents (Hermeto and Caetano, 2009). Low income family (mostly in developing countries) certainly borrow to pay for those expenses due to high fertility rate (more children), meanwhile high income family with low fertility rate (mostly in developed countries) also borrow due to high cost of living standard (Werding, 2014). Household takes loans for smoothing their consumption with the expectation of an increase in future income. The life cycle model of Modigliani and Brumberg (1954) states household behaviour over a given period by smoothing the consumption through borrowing and saving. Raising household debt for current consumption is quite worrying which household spend more than monthly income received. Looking at the current trends, the household take loans to overcome the financial and economic difficulties (Anderloni et al., 2012). Instead of smoothing their consumption, they lose their savings which may lead to financial vulnerability (Abid and Mohd Shafiai, 2018). Although household debt and its determinants are often being discussed globally, there still exists significant element that is ambiguity and uncertainty in the empirical research of associated between household debt and economics of fertility. Or does fertility is really matter of increasing rate of household debt that is overlooked among researchers?

Moreover, demographic change (low fertility rate and ageing population) becomes a significant issue which often argued upon due to its implication on banks' business model which affect financial stability of banking system. The business model of banks is severely related to the life cycle consumers' behaviour (Imam, 2013; Arista, 2008). In the beginning, the consumers are borrowers of the bank. Over their lifetime, they pay off their education and housing expenditures. Therefore, over the years, banks will increasingly be used for payment or transaction purposes, and less for maturity transformation. With less young borrowers due to the low fertility rate, traditional lending activities declines, and this affects banks' profit, balance sheet and stock price. This situation can create risks to financial stability (IMF, 2012b)

Minimal investigations were done to associate the instability of the financial system with the ageing population, even in developed countries such as Japan. In Japan, the oldest country in the world which has been distressed in the last two decades, very limited research was done to connect the instability of the financial system with the ageing population. Many other countries are facing this low fertility and ageing phenomenon, particularly in EMs countries, as a higher number of baby boomers are entering retirement. Examples of countries experiencing this issue include South Korea and China which are swiftly ageing. Furthermore, with the ongoing international crisis, policymakers have disregarded the result of slow-moving demographic changes on financial stability, as they are more focused on events that require short-term attention.

However, it is difficult to determine the extent to which the young-age population would impact the banks' decreasing retail banking activities. This is because, the decreasing demand from these young customers can be partly compensated by the increasing demand from pensioners who receive incentives to save, often, the increasing cost of old age and dependency due to increased life expectancy plays an important role in inducing saving habits among pensioners. Hence, the third objective fulfils this gap by studying the consequences of low fertility level and maturing populations on financial stability, focusing on developed and developing countries. Comprehensive findings on how demographics changes (fertility and ageing population) impact on financial stability helps resolve issues concerning the lack of analysis in literature. Most existing demographic studies noticeably emphasis on the analysis by uitilising using time-series data of a single country or cross-sectional data. Only a limited number of studies have utilised the inter-jurisdictional variation within a country. Hence, this creates a gap that requires attention. As mentioned by MacKellar, Ermolieva, Horlacher, & Mayhew (2004) the nature of the demographic problem is complex, multifaceted, and ill-defined; often further complicated with unclear, uncertain and ineffective result.

Overall, this study is motivated by the limited theoretical and empirical evidence that supports the role of financial development on fertility and how fertility can affect household debt and financial stability. This study provides new evidence and deeper insight into the body of literature, by comprehensively studying the following aspects; first, the association between financial development in developed and developing countries; second, the effect of fertility on household debt in selected developed countries and third, the effect of fertility to financial stability in both developed and developing countries.

1.4 Objectives of the Study

General Objective:

The general objective of the study is to access the linkages and meaningful relationship between financial development and fertility and how fertility behaviour can explain household debt and financial stability. The specific objectives of the study are:

- i. To determine the impact of financial development factors, socio-economic, macroeconomic and governance factors on fertility.
- ii. To examine the long run relationship between household debt and fertility and other economic factors, and
- iii. To investigate the effect of fertility and financial stability.

1.5 Significance of the Study

This research makes new inroads and contributes essential findings to the objectives of the study. First, the study will provide deeper insights and comprehensive coverage to the empirical evidence of the body of literature, studies on the association between the economics of fertility, financial development, household debt, and financial stability using an extensive selection of countries. The primary purpose of this study is to improve the understanding of, the relationship between fertility and financial development, socio-economic and governance variables. Although several past studies have contributed extensively, the information collected back then remains in bits and pieces. Empirical evidence readily acknowledges that fertility is an undeniably imperative subject and need to be investigated extensively. A novelty in this research is the investigation carried out on the economies of fertility from a wider perspective and in a more global context. This study is significant for researchers and academicians to understand deeper the economics fertility financial development, household debt, and financial stability, whereas banks and financial institutions can the information available to improve and diversity financial instruments and services provided for consumers.

Next, the study analyses and provides information on the relationship between household debt and fertility. Household debt is a relatively new issue, and at present, there is a serious lack of comprehensive literature on the topic worldwide. The research attempts to contribute by adding-on to the limited household debt literature concerning fertility. This study explores how credit causes household indebtedness and how much it is influenced by fertility decision. This outcome of the research can be used to distinguish to what extent fertility influences household debt. The analysis of the effect of fertility on household debt is important and can assist household to manage their consumption and cost of childbearing and education. In addition, the study can facilitate central bank to implement appropriate policies to control household debt, provide awareness and educate household in terms of family financial planning.

The impact of demographic change (increasing ageing population and low fertility level) is quite huge. Population ageing and low fertility tend to lower both labourforce participation and saving rates (change bank business model), thereby raising concerns about a future slowing economic growth and financial instability. The higher rate of ageing population (risk-averse population) has decreased investment and saving, while low rate of fertility will lessen the youth population in future years who are the potential savers and investors in the financial market. In addition, ageing population has been fiscal burdened to government, such as raising pension funds, health cares and expenditures. The study examines to what extend the demographic change (ageing population and low fertility) will affect bank business model and financial sector instability as well which will enlighten academician and researchers on the lacking of the issue in the literature.

The impact of declining fertility is quite huge. There is no doubt that the result of the study will clarify and enlighten academicians, economists, researchers and policy makers on financial development, financial stability and fertility as new contribution of study, especially on credit accessibility, phenomenon of household debt and future trend of fertility. It is apparent that the information, data, discussion and analysis are capable of producing a holistic work to facilitate policymakers; which includes banking sector, financial institutions and the government. It is important to comprehend the trends, factors and implications for the development of a good policy, as it can avoid future threats in the form of financial instability, unemployment, fiscal cost, labour shortage and etc., to the country.

1.6 The Scope of the Study

Fertility decision is influenced by many factors. The first objective examines the effect of financial development on the number of children a family decide to have, taking into consideration the measurement of financial sector development; financial depth, accessibility, as well as the measurement of governance such as voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, the rule of law and control of corrupt. The study applied balance data for period of 2007-2011 to 42 developed countries and 43 developing countries.

At present, household debts due to financial development and financial deepening is a common phenomenon in many countries. This has led to it being regarded as a crucial subject to be debated. Thus, the second objective determines whether fertility decision and macroeconomic variables are considered as factors that influence household debts. The study assembled panel data of the household debt and other macroeconomic variables from 2005 to 2013 for 24 selected OECD countries. The countries included were Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Ireland, Japan, Norway, the Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Meanwhile, the third objective examines the effect of fertility decision on financial sector stability. Here, the focus was directed to the stability of commercial banks based on the GMM estimator for 30 developed countries and 34 developing countries from the period between 2007 and 2011.

1.7 Organization of the Study

The study is organised into five chapters. The present chapter focuses on the introduction and background of the study. The latter part of Chapter 1 discusses the problem statement, research objective and significant of the study. The following, chapter 2 reviews the theoretical and empirical studies on the main issues of the study that includes financial development, household debt, fertility and financial stability. The third chapter presents detailed information on estimation techniques, data sources, data description, and their appropriate model specification for the realization of each objective of the study. The discussion will involve the interpretation and discussion of the empirical result for each objective as specified in the models designs. Finally, chapter 5 includes the summary of the thesis leads to an analysis of policy implication and proposed avenue for future studies.

REFERENCES

- Abdullah, N., Bakar, N. A., & Abdullah, H. (2013). Fertility model and female labour force participation in selected ASEAN countries. *Journal of Economics, Business and Management*, 1(3), 1–4. doi:10.7763/JOEBM.2013.V1.63
- Abel, A. B. (2003). The effects of a baby boom on stock prices and capital accumulation in the presence of social security. *Econometrica*, 71, 551–578.
- Abid, A., & Mohd Shafiai, M. H. (2018). The determinants of household financial vulnerability in Malaysia and its effect on low-income groups. *Journal of Emerging Economies and Islamic Research*, 6(1), 32–43.
- Abid, L., Ouertani, M. N., & Zouari-Ghorbel, S. (2014). Macroeconomic and bankspecific determinants of household's non-performing loans in Tunisia: A dynamic panel data. *Procedia Economics and Finance*, 13, 58–68. doi:10.1016/S2212-5671(14)00430-4
- Abu-bader, S., & Abu-qarn, A. S. (2008). Financial development and economic growth: The Egyptian experience. *Journal of Policy Modeling*, 30, 887–898. doi:10.1016/j.jpolmod.2007.02.001
- Abu-Bader, S., & Abu-Qarn, A. S. (2008). Financial development and economic growth: The Egyptian experience. *Journal of Policy Model*, 30(5), 887–898.
- Ackerman, J. (2004). Co-governance for accountability: Beyond "exit" and "voice." World Development, 32(3), 447-463. doi:10.1016/j.worlddev.2003.06.015
- Adams, C. (2008). Emerging East Asian banking systems ten years after the 1997/98 crisis. Asian Development Bank Regional Economic Integration Working Paper, 16(16). Retrieved from papers2://publication/uuid/7F8CF262-CDA4-4699-85C2-68052DFD647F
- Adams, C. A., & Harte, G. (1998). The changing portrayal of the employment of women in British banks'and retail companies' corporate annual reports. *Accounting, Organizations and Society, 23*(8), 781–812.
- Adserà, A. (2004). Changing fertility rates in developed countries: The impact of labor market institutions. *Journal of Population Economics*, 17(1), 17-43. doi:10.1007/s00148-003-0166-x
- Agier, I., Guérin, I., & Szafarz, A. (2012). Child gender and parental borrowing: Evidence from India. *Economics Letters*, 115(3), 363-365. doi:10.1016/j.econlet.2011.12.082
- Ahmad Khan, H. H., Abdullah, H., & Samsudin, S. (2016). Modelling the determinants of Malaysian household debt. *International Journal of Economics and Financial Issues*, 6(4), 1468–1473.

- Ahmed, K., Bodjongo, M., Juliot, M., & Abid, I. (2015). Financial development, Financial instability and economic growth: The case of Maghreb countries. International Journal of Economics and Financial Issues, 5(4), 1043–1054.
- Alesina, A., Ardagna, S., Nicoletti, G., & Schiantarelli, F. (2005). Regulation and investment. Journal of the European Economic Association, 3(4), 791–825. doi:10.1017/CBO9781107415324.004
- Alias, Z., Azmi, R., & Mohd Yusof, R. (2018). The effects of macroeconomics determinants and secured financing of Islamic banks on personal insolvency: An empirical investigation on Malaysia. *International Journal of Economics*, *Management and Accounting*, 26(2), 475–497.
- Almasi-Hashiani, A., Sepidarkish, M., Vesali, S., & Omani-Samani, R. (2016). The correlation of human development index on fertility and mortality rate: A global ecological study. *International Journal of Pediatrics*, 4(36), 4071– 4080. doi:10.22038/ijp.2016.7680
- Al-Qudsi, S. (1998). The demand for children in Arab countries: evidence from panel and count data models. *Journal of Population Economics*, 11(3), 435–452.
- Amialchuk, A., Lisenkova, K., Salnykov, M., & Yemelyanau, M. (2014). Economic determinants of fertility in Belarus. *Economics of Transition*, 22(3), 577–604. doi:10.1111/ecot.12043
- Amsden, A. H., & Euh, Y. D. (1993). South Korea's 1980s financial reforms: goodbye financial repression, hello new institutional restraints. World Development, 21(3), 379-390.
- Anderloni, L., Bacchiocchi, E., & Vandone, D. (2012). Household financial vulnerability: An empirical analysis. *Research in Economics*, 66(3), 284–296.
- Ang, J. B., & Mckibbin, W. J. (2007). Financial liberalization, financial sector development and growth: Evidence from Malaysia. *Journal of Development Economics*, 84(1), 215–233. doi:10.1016/j.jdeveco.2006.11.006
- Angeles, L. (2010). Demographic transitions: Analyzing the effects of mortality on fertility. *Journal of Population Economics*, 23(1), 99–120. doi:10.1007/s00148-009-0255-6
- Angeletos, G.-M., Laibson, D., Repetto, A., Tobacman, J., & Weinberg, S. (2001). The hyperbolic consumption model: Calibration, simulation, and evaluation. *Journal of Economic Perspectives*, 15(3), 47–68.
- Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies*, 58(2), 277–297.
- Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics*, 68, 29–51.

- Arista, J. D. (2008). The implications of aging for the structure and stability of financial markets (No. 163). Political Economy Research Institute, University of Massachusetts Amherst.
- Ashcraft, A. B., & Adrian, T. (2012). *Shadow banking : A review of the literature*. Report 580, Federal Reserve Bank of New York.
- Bakshi, G., & Chen, Z. (1994). Baby boom, population aging, and capital markets. Journal of Business, 67(2), 165–202. Retrieved from http://www.jstor.org/stable/2353102
- Banerjee, A. V, & Duflo, E. (2007). The Economic lives of the poor. Journal of Economic Perspectives, 21(1), 141-167.
- Barba, A., & Pivetti, M. (2008). Rising household debt: Its causes and macroeconomic implications - A long-period analysis. *Cambridge Journal of Economics*, 33(1), 113–137. doi:10.1093/cje/ben030
- Barnes, S., & Young, G. (2003). The rise in US household debt : Assessing its causes and sustainability (No. 206). Bank of England, England.
- Barro, R. J., & Becker, G. S. (1989). Fertility choice in a model of economic growth. Econometrica, 57(2), 481-501.
- Barro, R. J., & Xavier, S. I. M. (1995). Economic Growth. New York: McGraw-Hill.
- Basso, A., Bodenhorn, H., & Cuberes, D. (2014). Fertility and financial development: Evidence from U.S. counties in the 19th Century. NBER Working Paper, No. 20491, Cambridge.
- Becker, G. S. (1960a). An economic analysis of fertility (Vol. Demographi). Columbia University Press. Retrieved from http://www.nber.org/books/univ60-2
- Becker, G. S. (1960b). An economic analysis of fertility. Priceton: Princeton University Press.
- Becker, G. S. (1965). A Theory of the Allocation of Time. *The Economic Journal*, 75(299), 493–517.
- Becker, G. S., & Barro, R. J. (1988). A reformulation of the economic theory of fertility. *Quarterly Journal of Economics*, 53, 1-25.
- Becker, G. S., & Lewis, H. (1973). On the interaction between the quatity and quality of children. *Journal of Political Economy*, 81, S279–S288.
- Becker, G. S., Murphy, K. M., & Tamura, R. (1990). Human capital, fertility, and economic growth. *Journal of Political Economy*, 98(5 (Part II)), S12-37.
- Beecham, J. (2006). Why costs vary in children's care services. Journal of Children's Services, 1(3), 50-62.

- Belal, A. R., Cooper, S. M., & Roberts, R. W. (2013). Vulnerable and exploitable: The need for organisational accountbility and transparency in emerging and less developed economies. Accounting Forum, 37(2), 81-91.
- Bernasek, A. (2003). Banking on social change: Grameen Bank lending to women. International Journal of Politics, Culture and Society, 16(3), 369-385.
- Berniní, C., & Cracolici, M. F. (2015). Demographic change, tourism expenditure and life cycle behaviour. *Tourism Management*, 47, 191–205. doi:10.1016/j.tourman.2014.09.016
- Bhattacharjee, M., & Rajeev, M. (2014). Accessibility to credit and its determinants: A state-level analysis of cultivator households in India. The Journal of Applied Economic Research, 8(3), 285–300. doi:10.1177/0973801014531137
- Bielecki, M., Goraus, K., Hagemejer, J., & Tyrowicz, J. (2015). Decreasing fertility vs increasing longevity: Raising the retirement age in the context of ageing processes. *Economic Modelling*, 52(Part A), 125-143. doi:10.1016/j.econmod.2015.02.020
- Billari, F. C., & Galasso, V. (2009). What explains fertility? Evidence from Italian pension reforms (No. 2646). CSEF Working Papers 209, Centre for Studies in Economics and Finance (CSEF), University of Naples, Italy.
- Bloom, D., Canning, D., Hu, L., Liu, Y., Mahal, A., & Yip, W. (2006). Why has China's economy taken off faster than India's? In 2006 Pan Asia Conference. Retrieved from http://scid.stanford.edu/events/PanAsia/Papers/papersonly.html
- Bloom, D., Canning, D., & Malaney, P. (2000). Demographic change and economic growth in Asia. *Population and Development Review*, 26, 257-290.
- Bloom, D. E., & Canning, D. (2004). Global demographic change: Dimensions and economic significance. NBER Working Paper, No. 10817, National Bureau of Economic Research, Cambridge.
- Bloom, D. E., Canning, D., & Fink, G. (2007). Realizing the Demographic Dividend: Is Africa Any Different? In African Economic Research Consortium.
- Bloom, D. E., Canning, D., & Fink, G. (2011). Implications of population aging for economic growth. NBER Working Paper, No. 16705, National Bureau of Economic Research, Cambridge. doi:10.1093/oxrep/grq038
- Bloom, D. E., Canning, D., Fink, G., & Finlay, J. E. (2009). Fertility, female labor force participation, and the demographic dividend. *Journal of Economic* Growth, 14(2), 79-101. doi:10.1007/s10887-009-9039-9

- Bloom, D. E., Canning, D., Hu, L., Liu, Y., Mahal, A., & Yip, W. (2010). The contribution of population health and demographic change to economic growth in China and India. *Journal of Comparative Economics*, 38(1), 17–33. doi:10.1016/j.jce.2009.11.002
- Bloom, D. E., & Eggleston, K. N. (2014). The economic implications of population ageing in China and India: Introduction to the special issue. *The Journal of the Economics of Ageing*, 4, 1–7. doi:10.1016/j.jeoa.2014.10.002
- Bloom, D., & Williamson, J. G. (1998). Demographic transitions and economic miracles in emerging Asia. World Bank Economic Review, 12, 419-456.
- Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115–143. doi:10.1016/S0304-4076(98)00009-8
- BNM. (2018). Financial Stability and Financial System Report 2018. Bank Negara Malaysia, Kuala Lumpur.
- Boldrin, M., & Jones, L. E. (2002). Mortality, fertility, and saving in a Malthusian economy. *Review of Economic Dynamics*, 5(4), 775-814. doi:10.1006/redy.2002.0186
- Bond, S. R. (2002). Dynamic panel data models: A guide to micro data methods and practice. *Portuguese Economic Journal*, 1(2), 141–162.
- Borio, C., & Drehmann, M. (2009). Assessing the risk of banking crises revisited. *BIS Quarterly Review*, (March), 29-46. Retrieved from http://www.bis.org/publ/qtrpdf/r_qt0903e.pdf
- Borsch-Supan, A. (1996). The impact of population ageing on savings, investment and growth in the OECD area. In *Future Global Capital Shortages -Real Threat or Pure Fiction?* OECD, Paris.
- Bosworth, B. P., Bryant, R. C., & Burtless, G. (2004). *The impact of aging on financial markets and the economy: A survey.* The Brookings Institution.
- Boucekkine, R., de la Croix, D., & Licandro, O. (2003). Early mortality declines at the dawn of modern growth. *Scandinavian Journal of Economics*, 105(3), 401–418.
- Brown, S. B., & Taylor, K. B. (2008). Household debt and financial assets: Evidence from Great Britain, Germany and the United States. *Journal of the Royal Statistical Society. Series A (Statistics in Society)*, 171(3), 615–643. Retrieved from http://www.le.ac.uk/economics/research/discussion/papers2005.html
- Cai, F. (2004). Demographic transition, demographic dividend and the sustainability of the economic growth. *Population Research*, 128(12), 2–9.

- Caillier, J. G. (2011). Are state government workers satisfied with their jobs when the organization is effective? *Public Administration Quarterly*, 35(1), 93–127.
- Caldwell, J. C. (1976). Toward a restatement of demographic transition theory. *Population and Development Review*, 2(3/4), 321-366.
- Cecchetti, S. G., Mohanty, M. S., & Zampolli, F. (2011). *The real effects of debt* (No. 352). Bank of International Settlement.
- Cervellati, M. (2007). Human capital, mortality and fertility: A unified theory of the economic and demographic transition. Discussion Paper Series, No. 2905, IZA Institute of Labor Economics.
- Chandani, A., Mehta, M., & Neeraja, B. (2014). Women CEOs and financial performance of banks: An empirical research of Indian private sector banks. *Management*, 19(1), 231–246. Retrieved from http://www.scopus.com/inward/record.url?eid=2-s2.0-84904039603&partnerID=40&md5=9461ddd4e97c0b8e99903209fc013120
- Chang, W., Chen, Y., & Chang, J. (2013). Growth and welfare effects of monetary policy with endogenous fertility. *Journal of Macroeconomics*, 35(0), 117–130. doi:http://dx.doi.org/10.1016/j.jmacro.2012.10.004
- Charpe, M., & Flaschel, P. (2013). Workers' debt, default and the diversity of financial fragilities. *Structural Change and Economic Dynamics*, 27(C), 48-65. doi:10.1016/j.strueco.2013.07.001
- Chawla, M., Betcherman, G., & Banerji, A. (2007). From red to gray. The World Bank, Washington, D.C.
- Chikada, K., Eich, F., Imam, P., Kiff, J., Kisser, M., & Soto, M. (2012). Chapter 4: The Financial Impact of Longevity Risk. Global Financial Safety Report. International Monetary Fund, Washington, D.C.
- Christelis, D., Jappelli, T., Paccagnella, O., & Weber, G. (2009). Income, wealth and financial fragility in Europe. Journal of European Social Policy, 19(4), 359– 376. doi:10.1177/1350506809341516
- Cigno, A., & Rosati, F. C. (1992). The effects of financial markets and social security on saving and fertility behaviour in Italy. *Journal of Population Economicsconomics*, 5(4), 319-341. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12285683
- Cigno, A., & Rosati, F. C. (1996). Jointly determined saving and fertility behaviour: Theory and estimates for Germany, Italy, UK and USA. *European Economic Review*, 40, 1561–1589.
- Cigno, A., & Rosati, F. C. (1997). Rise and fall of the Japanese saving rate : The role of social security and intra-family transfers. *Japan and the World Economy*, 9, 81–92.

- Cihak, M., Demirguc-Kunt, A., Feyen, E., & Levine, R. (2012). Benchmarking financial systems around the world. Policy Research Working Paper, No. WPS 6175, The World Bank Group.
- Cihak, M., & Hesse, H. (2010). Islamic banks and financial stability: An empirical analysis. *Journal of Financial Services Research*, 38(2), 95–113.
- Cochrane, S. G., Ell, K., & Korobkin, M. (2019). Some rising pressure points in global debt. Moody's Analytics, New York, Unites States of America.
- Cohen, A., Dehejia, R., & Romanov, D. (2007). Do financial incentives affect fertility? NBER Working Paper, No. 13700, National Bureau of Economic Research, Cambridge.
- Cohen, A., Dehejia, R., & Romanov, D. (2009). Financial incentives and fertility. Discussion Paper No. 5, Center for Development Tel Aviv University.
- Córdoba, J. C., & Ripoll, M. (2012). Barro-Becker with credit frictions. Working Paper No. 12019, Iowa State University, Department of Economics.
- Creel, J., Hubert, P., & Labondance, F. (2015). Financial stability and economic performance. *Economic Modelling*, 48, 25–40. doi:10.1016/j.econmod.2014.10.025
- Cremer, H., Gahvari, F., & Pestieau, P. (2006). Pensions with endogenous and stochastic fertility. Journal of Public Economics, 90, 2303-2321. doi:10.1016/j.jpubeco.2006.03.007
- Crespo Cuaresma, J., Lábaj, M., & Pružinský, P. (2014). Prospective ageing and economic growth in Europe. The Journal of the Economics of Ageing, 3, 50– 57. doi:10.1016/j.jeoa.2014.05.003
- Cucinelli, D. (2015). The impact of non-performing loans on bank lending behavior: Evidence from the Italian banking sector. *Eurasian Journal of Business and Economics*, 8(16), 59-71. doi:10.17015/ejbe.2015.016.04
- D'Addio, A. C., & D'Erdole, M. (2005). Policies, institutions and fertility rates: A panel data analysis for OECD countries. *OECD Economic Studies*, 9(2), 7-45.
- Daley, D. M. (1986). Humanistic management and organizational success: The effect of job and work environment characteristics on organizational effectiveness, public responsiveness, and job satisfaction. *Public Personnel Management*, 15(2), 131–142.
- Davidson, S. (2010). Imprudent lending and the sub-prime crisis: An Austrian School Perspective. *Griffith Law Review*, 19(1), 105–116.
- Davis, E. P. (2002). Ageing and Financial Stability. In A. J. Auerbach & H. Herrmann (Eds.), Ageing, Financial Markets and Monetary Policy (pp. 191-227). Springer-Verlag Berlin Heidelberg.

- Davis, E. P. (2005). Challenges posed by ageing to financial and monetary stability. The Geneva Paper, 30, 542-564.
- Davis, E. P. (2007). How will ageing affect the structure of financial markets. Economics and Finance Working Papers, Brunel University.
- Davis, E. P., & Stone, M. R. (2004). Corporate financial structure and financial stability. *Journal of Financial Stability*, 1, 65-91. doi:10.1016/j.jfs.2004.06.003
- de la Croix, D., Lindh, T., & Malmberg, B. (2009). Demographic change and economic growth in Sweden: 1750-2050. *Journal of Macroeconomics*, 31(1), 132-148. doi:10.1016/j.jmacro.2007.08.014
- De Vany, A., & Sanchez, N. (1979). Land tenure structures and fertility in Mexico. *The Review of Economics and Statistics*, 61(1), 67–72.
- Debelle, G. (2004). Macroeconomic implications of rising household debt. Working Paper No. 153, Monetary and Economic Department, Bank for International Settlements, Switzerland.
- Demetriades, P., & Luintel, K. (1996). Financial development, economic growth and banking sector controls: Evidence from India. *Economic Journal*, 106, 359– 374.
- Demirgue Kunt, A., & Detragiache, E. (1998). Financial liberalization and financial fragility. IMF Working Paper, No. 83, International Monetary Fund.
- Demirgüç-kunt, A., & Levine, R. (2008). Finance, financial sector policies, and long-run growth. Policy Research Working Paper, No. 4469, Finance and Private Sector Team, Development Research Group, The World Bank, Washington, USA.
- Dettling, L. J., & Kearney, M. S. (2014). House prices and birth rates: The impact of the real estate market on the decision to have a baby. *Journal of Public Economics*, 110, 82-100. doi:10.1016/j.jpubeco.2013.09.009
- Diaconu, R.-I., & Oanea, D.-C. (2014). The main determinants of bank's stability. Evidence from Romanian banking sector. *Procedia Economics and Finance*, 16, 329-335. doi:10.1016/S2212-5671(14)00810-7
- Ding, W., & Zhang, Y. (2014). When a son is born: The impact of fertility patterns on family finance in rural China. *China Economic Review*, 30, 192–208. doi:10.1016/j.chieco.2014.06.008
- Dudley, W. C. (2009). More lessons from the crisis. Symposium Center for Economic Policy Studies (CEPS), Princeton, New Jersey.

- Dunn, L. F., & Mirzaie, I. A. (2016). Consumer debt stress, changes in household debt, and the great recession. *Economic Inquiry*, 54(1), 201–214. doi:10.1111/ecin.12218
- Easterlin, R. (1975). An economic framework for fertility analysis. *Studies in Family Planning*, 7, 54–63.
- Ebenstein, A., Hazan, M., & Simhon, A. (2011). Raising the financial costs of children and fertility responses: Evidence from the Kibbutz. Working Paper, No. DP8634, Center for Economic Policy Research.
- ECB. (2006). EU banking structures. European Central Bank. Germany.
- ECB. (2013). Annual Report Federal Financial Supervisory Authority (BaFin). European Central Bank, Brussels.
- Elgin, C., & Tumen, S. (2012). Can sustained economic growth and declining population coexist? *Economic Modelling*, 29(5), 1899–1908. doi:10.1016/j.econmod.2012.06.004
- Eltigani, E. E. (2005). Fertility transition in Arab countries : A re-evaluation. Journal of Population Research, 22(2), 163–183.
- Engelhardt, G., & Poterba, J. M. (1991). Demographics and house prices: The Canadian evidence. *Regional Science and Urban Economics*, 21, 539-546.
- Epure, M. (2012). Population ageing A demographic trend with various consequences. *Review of Applied Socio-Economic Research*, 4(2), 97–107.
- Estrada, G., Donghyun, P., & Ramayandi, A. (2010). Financial development and economic growth in developing Asia. Asian Development Bank Working Paper Series (Vol. 233). doi:10.5539/ass.v10n9p8
- Ezeh, A. C., Mberu, B. U., & Emina, J. O. (2009). Stall in fertility decline in Eastern African countries: Regional analysis of patterns, determinants and implications. *Philosophical Transactions: Biological Sciences*, 364(1532), 2991–3007. doi:10.1098/rstb.2009.0166
- Fairlamb, C. D., & Nieuwoudt, W. L. (1991). Economic factors affecting human fertility in the developing areas of Southern Africa. Agricultural Economics, 6(2), 185–200. doi:http://dx.doi.org/10.1016/0169-5150(91)90024-F
- Fanti, L., & Spataro, L. (2013). On the relationship between fertility and public national debt. *Economic Modelling*, 33, 843–849. doi:http://dx.doi.org/10.1016/j.econmod.2013.06.003
- Faruqee, H., & Muhleisen, M. (2003). Population aging in Japan: Demographic shock and fiscal sustainability. *Japan and the World Economy*, 15, 185-210.
- Feng, Y., Kugler, J., & Zak, P. J. (2000). The Politics of fertility. International Studies Quarterly, 44, 667–693.

- Fernandez-Corugedo, E. (2002). Soft-liquidity constraints and precautionary savings. Working Paper, No. 158, Bank of England. doi:10.2139/ssrn.340485
- Feyer, J., Sacerdote, B., & Stern, A. D. (2008). Will the stock return to Europe and Japan? Understanding fertility within developed nations. *Journal of Economic Perspectives*, 22(3), 3–22.
- Filoso, V., & Papagni, E. (2011). Fertility choice and financial development (No. 02/2011). Economics and Econometrics Research Institute, Belgium.
- Filoso, V., & Papagni, E. (2015). Fertility choice and financial development. *European Journal of Political Economy*, 37, 160-177. doi:10.1016/j.ejpoleco.2014.11.004
- Fiordelisi, F., Marques-Ibanez, D., & Molyneux, P. (2011). Efficiency and risk in European banking. Journal of Banking and Finance, 35(5), 1315–1326. doi:10.1016/j.jbankfin.2010.10.005
- Francis, B. B., Hasan, I., & Sun, X. (2009). Political connections and the process of going public: Evidence from China. Journal of International Money and Finance, 28(4), 696–719. doi:10.1016/j.jimonfin.2009.01.002
- Friedman, M. (1957). The permanent income hypothesis. In F. Milton (Ed.), A Theory of the Consumption Function (Vol. I, pp. 20-37). Princeton University Press.
- Frini, O., & Muller, C. (2012). Demographic transition, education and economic growth in Tunisia. *Economic Systems*, 36(3), 351-371. doi:http://dx.doi.org/10.1016/j.ecosys.2012.04.002
- FSB. (2016). Global shadow banking monitoring report 2016. Financial Stability Board, Basel, Switzerland. Retrieved from http://www.fsb.org/wpcontent/uploads/global-shadow-banking-monitoring-report-2016.pdf
- Gallin, J. (2013). Shadow banking and the funding of the nonfinancial sector. Finance and Economic Discussion Series, Divisions of Research & Statistics and Monetary Affairs, Federal Reserve Board, Washington, D.C.
- Galor, O., & Mountford, A. (2008). Trading population for productivity: Theory and evidence. *Review of Economic Studies*, 85(4), 1143–1179.
- Galor, O., & Weil, D. (2000). Population, technology, and growth: From Malthusian stagnation to the demographic transition and beyond. *The American Economic Review*, 90(4), 806–828.
- Galor, O., & Zang, H. (1997). Fertility, income distribution, and economic growth: Theory and cross-country evidence. Japan and the World Economy, 9(2), 197– 229. doi:http://dx.doi.org/10.1016/S0922-1425(96)00245-9

- Gan, J. (2004). Banking market structure and financial stability: Evidence from the Texas real estate crisis in the 1980s. *Journal of Financial Economics*, 73(3), 567-601. doi:10.1016/j.jfineco.2003.07.004
- Goldstein, J. R., Sobotka, T., & Jasilioniene, A. (2014). The end of "lowest-low" fertility? *Population and Development Review*, 35(4), 663-699.
- Gurley, J., & Shaw, E. (1967). Financial structure and economic development. Economic Development and Cultural Change, 15(3), 257-268.
- Habibullah, M. S., Farzaneh, N., & Haji Din, B. (2016). Declining fertility and financial development in high income and low-income countries. *International Journal of Applied Business and Economic Research*, 14(1), 277–290.
- Hafner, K. A., & Mayer-Foulkes, D. (2013). Fertility, economic growth, and human development causal determinants of the developed lifestyle. Journal of Macroeconomics, 38, 107-120. doi:http://dx.doi.org/10.1016/j.jmacro.2013.04.001
- Haggard, S., & Tiede, L. (2011). The rule of law and economic growth: Where are we? World Development, 39(5), 673-685. doi:10.1016/j.worlddev.2010.10.007
- Hallak, I. (2013). Private sector share of external debt and financial stability: Evidence from bank loans. *Journal of International Money and Finance*, 32, 17–41. doi:10.1016/j.jimonfin.2012.02.017
- Hamal, M., Dieleman, M., de Brouwere, V., & de Cock Buning, T. (2018). How do accountability problems lead to maternal health inequities? A review of qualitative literature from Indian public sector. *Public Health Reviews*, 39(9), 1-27.
- Han, S., & Mulligan, C. B. (2001). Human capital, heterogeneity and estimated degrees of intergenerational mobility. *Economic Journal*, 111(470), 207-243.
- Hanf, M., Van-Melle, A., Fraisse, F., Roger, A., Carme, B., & Nacher, M. (2011). Corruption kills: Estimating the global impact of corruption on children deaths. *PLoS ONE*, 6(11).
- Harvey, C. R. (2009). Financial openness and productivity. NBER Working Paper Series, No. 14843.
- Hasegawa, T. (2011). How does aging affect household financial assets allocation in Japan?
- Hassan, M. K., Sanchez, B., & Yu, J. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Review of Economics* and Finance, 51(1), 88–104. doi:10.1016/j.qref.2010.09.001

- Henderson, D. J., Papageorgiou, C., & Parmeter, C. F. (2013). Who benefits from financial development? New methods, new evidence. *European Economic Review*, 63, 47–67. doi:http://dx.doi.org/10.1016/j.euroecorev.2013.05.007
- Hermeto, A. M., & Caetano, A. J. (2009). Socioeconomics status, family structure and child outcomes in Brazil: Health in the childhood. *International Journal of Social Economics*, 36(10), 979-995.
- Hollo, D. (2007, November). Household indebtedness and financial stability : Reasons to be afraid? *Magyar Nemzeti Bank*, (November), 23–30.
- Holtz-Eakin, D., Newey, W., & Rosen, H. (1988). Estimating vector autoregressions with panel data. *Econometrica*, 56, 1371–1395.
- Hondroyiannis, G., & Papapetrou, E. (1999). Fertility choice and economic growth: Empirical evidence from the U.S. International Advances in Economic Research, 5(1), 108-120.
- Hondroyiannis, G., & Papapetrou, E. (2001). Demographic changes, labor effort and economic growth: empirical evidence from Greece. *Journal of Policy Modeling*, 23(2), 169–188. doi:http://dx.doi.org/10.1016/S0161-8938(00)00037-5
- Hondroyiannis, G., & Papapetrou, E. (2005). Fertility and output in Europe: New evidence from panel cointegration analysis. *Journal of Policy Modeling*, 27(2), 143–156. doi:http://dx.doi.org/10.1016/j.jpolmod.2004.12.001
- Honohan, P. (2004). Financial sector policy and the poor: Selected findings and issues (No. 43). Working Paper, No. 43, The World Bank, Washington, D.C.
- Horioka, C. Y. (1991). The determinants of Japans private saving rate, the impact of the age structure of the population and other factor. Bank of Japan Economic Studies Quarterly, 42, 237–253.
- Hsueh, S., Hu, Y., & Tu, C. (2013). Economic growth and financial development in Asian countries: A bootstrap panel Granger causality analysis. *Economic Modelling*, 32, 294–301. doi:10.1016/j.econmod.2013.02.027
- Huang, S., Chen, Z., Liu, H., & Zhou, L. (2017). Job satisfaction and turnover intention in China: The moderating effects of job alternatives and policy support. *Chinese Management Studies*, 11(4), 689–706. doi:10.1108/CMS-12-2016-0263
- ICAEW. (2014). Economic insight: South East Asia quarterly briefing Q3 2014. The Centre for Economics and Business Research, ICAEW, United Kingdom.
- Imam, P. (2013). Demographic shift and the financial sector stability: The case of Japan. Journal of Population Ageing, 6(4), 269–303. doi:10.1007/s12062-013-9089-9

- IMF. (2012a), Chapter 3: Dealing with household debt. World Economic Outlook: Growth Resuming, Dangers Remain, International Monetary Fund, United States of America.
- IMF. (2012b). The financial impact of longevity risk. Global Financial Stability Report, IMF.
- IMF. (2017). Financial sector assessment program-technical note-long-term challenges for financial intermediation. International Monetary Fund, Washington, D.C.
- Johnson, S., Kaufmann, D., & Zoido-Lobaton, P. (1998). Regulatory discretion and the unofficial economy. *The American Economic Review*, 88(2), 387-392.
- Jung, W. S. (1986). Financial development and economic growth: International evidence. *Economic Development and Cultural Change*, 34, 333-346.
- Kampen, J. K., De Walle, S. V., & Bouckaert, G. (2006). Assessing the relation between satisfaction with public service delivery and trust in government. The impact of the predisposition of citizens towards government on evaluations of its performance. Public Performance and Management Review, 29(4), 387– 404.
- Kasman, A., & Carvallo, O. (2014). Financial stability, competition and efficiency in Latin American and Caribbean banking. *Journal of Applied Economics*, 17(2), 301-324. doi:10.1016/S1514-0326(14)60014-3
- Kearns, A. (2003). Mortgage arrears in the 1990s: Lessons for today. Quarterly Bulletin (Vol. Autumn). Central Bank and Financial Services Authority of Ireland, Ireland.
- Keese, M. (2012). Who feels constrained by high debt burdens? Subjective vs. objective measures of household debt. Journal of Economic Psychology, 33(1), 125-141. doi:10.1016/j.joep.2011.08.002
- Kim, J., Engelhardt, H., Prskawetz, A., & Aassve, A. (2009). Does fertility decrease household consumption? An analysis of poverty dynamics and fertility in Indonesia. *Demographic Research*, 20(26), 623–656. doi:10.4054/DemRes.2009.20.26
- King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. The Quarterly Journal of Economics, 108(3), 717-737.
- Knack, S., & Keefer, P. (1995). Institutions and economic performance: Cross-country tests using alternative institutional measures. *Economics and Politics*, 7(3), 207-227.
- Konno, S., Teramoto, A., & Mera, Y. (2011). Compiling statistics of shadow banking. IFC Bulletin, 36, 76-88.

- Kose, M., & Prasad, E. (2007). Liberalizing Capital Account Restrictions. In *Finance globalization: The impact on trade, policy, labor, and capital flows* (pp. 6–8).
 Washington DC, United States of America: International Monetary Fund Publication Services.
- Kuchler, A. (2012). Do microfinance programs change fertility? Evidence using panel data from Bangladesh. *The Journal of Developing Areas*, 46(2), 297–313.
- Lee, D.-J., Sirgy, M. J., Singhapakdi, A., & Lucianetti, L. (2018). The effect of explicit and implicit ethics institutionalization on employee life satisfaction and happiness: The mediating effects of employee experience in work life and moderating effects of work-family life conflict. *Journal of Business Ethics*, 147(4), 855-874.
- Lehr, C. S. (1999). Banking on fewer children : Financial intermediation, fertility and economic development. *Journal of Population Economics*, 12, 567–590.
- Leibenstein, H. (1957). Economic backwardness and economic growth. John Wiley & Sons Inc: New York.
- Levine, R. (1991). Stock markets, growth and tax policy. *The Journal of Finance*, 46, 1445–1465.
- Levine, R., Loayza, N., & Beck, T. (2000). Financial intermediation and growth: Causality and causes. Journal of Monetary Economics, 46, 31-77.
- Lim, K.-M., & Weil, D. N. (2003). The baby boom and the stock market boom. *The Scandinavian Journal of Economics*, 105(3), 359–378.
- Liu, L. (2003). The direction of causality between financial development and economic growth, 72, 321-334. doi:10.1016/S0304-3878(03)00079-8
- Liu, S., & Hu, A. (2013). Demographic change and economic growth: Theory and evidence from China. *Economic Modelling*, 35, 71–77. doi:10.1016/j.econmod.2013.06.041
- Liu, W. C., & Hsu, C. M. (2006). The role of financial development in economic growth: The experiences of Taiwan, Korea, and Japan. *Journal of Asian Economics*, 17(4), 667–690. doi:10.1016/j.asieco.2006.06.007
- Ludvigson, S. (1999). Consumption and credit: A model of time-varying liquidity constraints. *Review of Economics and Statistics*, 81(3), 434–447.
- Ma, G., Remolona, E., & Shim, I. (2009). Household debt: Implication for monetary policy and financial stability. BIS Paper, No. 46, Bank of International Settlement.
- MacKellar, L., Ermolieva, T., Horlacher, D., & Mayhew, L. (2004). Economic Impacts of Population Aging in Japan. Edward Elgar Publishing.

- Manchester, J. M., & Poterba, J. M. (1989). Second mortgages and household saving. Regional Science and Urban Economics, 19(2), 325-346.
- Mankiw, N. G., & Weil, D. N. (1989). The baby boom, the baby bust, and the housing market. Regional Science and Urban Economics, 19, 235-258.
- Mare, D. S. (2015). Contribution of macroeconomic factors to the prediction of small bank failures. Journal of International Financial Markets, Institutions and Money. doi:10.1016/j.intfin.2015.05.005
- María, J., Rocha, D., & Fuster, L. (2006). Why are fertility and female participation rates positively correlated across OECD countries? International Economic Review, 47(4), 1187-1222.
- Martins, N., & Villanueva, E. (2003). The impact of interest-rate subsidies on longterm household debt: Evidence from a large program. Economic Working Paper 713, Department of Economics and Business, Universitat Pompeu Fabra.
- Masson, P., Bayoumi, T., & Samjei, H. (1995). International evidence on the determinants of private saving. IMF Working Paper, W95/51, International Monetary Fund.
- Masson, P., & Tryon, R. W. (1990). Macroeconomic effects of projected population ageing in industrial countries. *IMF Staff Paper*, 37, 453-485.
- McKenzie, D. J. (2003). How do households cope with aggregate shocks? Evidence from the Mexican Peso Crisis. World Development, 31(7), 1179-1199. doi:10.1016/S0305-750X(03)00064-0
- McKinnon, R. I. (1973). Money and Capital in Economic Development. Brookings Institution, Washington, DC.
- Meng, X., Hoang, N. T., & Siriwardana, M. (2013). The determinants of Australian household debt: A macro level study. Journal of Asian Economics, 29, 80-90. doi:10.1016/j.asieco.2013.08.008
- Meniago, C., Mukuddem-Petersen, J., Petersen, M. a., & Mongale, I. P. (2013). What causes household debt to increase in South Africa? *Economic Modelling*, 33, 482–492. doi:10.1016/j.econmod.2013.04.028
- Menyah, K., Nazlioglu, S., & Wolde-rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modelling*, 37, 386-394. doi:10.1016/j.econmod.2013.11.044
- Mian, A., & Sufi, A. (2011). Consumer and economy part II: Household debt and weak US recovery. FRBSF Economic Letter.

- Micevska, M. B. (2001). Economic distruption, Malthusian fertility and economic growth. Washington, DC: The Brookings Institution.
- Modena, F., Rondinelli, C., & Sabatini, F. (2014). Economic insecurity and fertility intentions: The case of Italy. *Review of Income and Wealth*, 60, S233–S255. doi:10.1111/roiw.12044
- Modigliani, F. (1986). Life cycle, individual thrift, and the wealth of nations. The American Economic Review, 76(3), 297-313.
- Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K. K. Kurihara (Ed.), Post-Keynesian Economics. Rutgers University Press, New Brunswick. doi:10.4324/9781315016849
- Modigliani, F., & Cao, S. L. (2004). The Chinese saving puzzle and the life-cycle hypothesis. *Journal of Economic Literature*, 42(1), 145–170.
- Mokhtar, M., & Ismail, A. (2013). Shariah issues in managing household debt: The case of Malaysia. Jurnal Pengurusan, 37, 63–76. doi:10.15405/epsbs.2016.11.02.12
- Montalbano, P. (2011). Trade openness and developing countries' vulnerability: Concepts, misconceptions, and directions for research. World Development, 39(9), 1489-1502.
- Muhleisen, M. and, & Faruquee, H. (2001). Japan: Population ageing and the fiscal challenges. *Finance and Development*, 38, 10-13.
- Mulder, C. H. (2006). Home-ownership and family formation. Journal of Housing and the Built Environment, 21(3), 281-298. doi:10.1007/s10901-006-9050-9
- Mulder, C. H., & Billari, F. C. (2006). Home-ownership regimes and lowest-low fertility, (November), 23-24.
- Mulder, C. H., & Billari, F. C. (2010). Homeownership regimes and low fertility. Housing Studies, 25(4), 527-541. doi:10.1080/02673031003711469
- Mulder, C. H., & Wagner, M. (2001). The connections between family formation and first-time home ownership in the context of West Germany and the Netherlands. *European Journal of Population*, (17), 137–164.
- Narayan, P. K. (2006). Determinants of female fertility in Taiwan, 1966-2001: Empirical evidence from cointegration and variance decomposition analysis. *Asian Economic Journal*, 20(4), 393-407. doi:10.1111/j.1467-8381.2006.00241.x
- Nau, M., Dwyer, R. E., & Hodson, R. (2015). Can't afford a baby? Debt and young Americans. *Research in Social Stratification and Mobility*, 42, 114-122. doi:10.1016/j.rssm.2015.05.003

- Neher, P. A. (1971). Peasants, procreation and pensions. *American Economic Review*, 61(3), 380-389.
- Obadic, A., Cipin, I., & Pripuzic, D. (2007). Female labour force participation and fertility in Croatia-What causes what? Presented in 7th International Conference Enterprise in Transition, Split-Bol, Hrvatska, Croatia. Mei 2007.
- OECD. (2017). National accounts of OECD countries. OECD, Paris. Retrieved from http://www.oecd.org
- Ogawa, N. (2003). Japan's changing fertility mechanisms and its policy responses. Journal of Population Research, 20(1), 89-106.
- Ovseiko, P. (2007). Fertility decline: trends, drivers and differences. Oxford: Oxford Institute of Ageing.
- Papagni, E. (2006). Household borrowing constraints, fertility dynamics, and economic growth. Journal of Economic Dynamics & Control, 30, 27-54. doi:10.1016/j.jedc.2004.10.003
- Parker, J. A., & Preston, B. (2005). Precautionary saving and consumption fluctuations. American Economic Review, 95(4), 1119–1143. doi:10.1257/0002828054825556
- Perveen, A., & Munir, K. (2017). Impact of total, interbal and external government debt on interest in Pakistan (No. 83427). MPRA Paper. University of Central Punjab, Lahore, Pakistan.
- Pollin, R. (1988). The growth of U.S. household debt: Demand-side influences. Journal of Macroeconomics, 10(2), 231-248. doi:10.1016/0164-0704(88)90060-2
- Poterba, J. (2001). Demographic structure and asset returns. Review of Economics Statistics, 83, 565-584.
- Pozsar, Z., Adrian, T., Ashcraft, A., & Boesky, H. (2013). Shadow banking. Economic Policy Review, Federal Reserve Bank of New York.
- Pritchett, L. (1994). Desired fertility and the impact of population policies. *Population* and Development Review, 20(1), 1-55.
- Rajan, R. G., & Zingales, L. (2003). The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics*, 69(1), 5-50. doi:10.1016/S0304-405X(03)00125-9
- Rammohan, A. (2001). Development of financial capital markets and the role of children as economic assets. Journal of Internatinal Development, 13, 45-58.

- Ravazzini, L., & Kuhn, U. (2018). Wealth, Savings and Children Among Swiss, German and Australian Families. In R. Tilmann, M. Voorpostel, & P. Farago (Eds.), Social Dynamics in Swiss Society. Life Course Research and Social Policy Vol 9 (pp. 161–174). Springer, Cham. doi:10.1007/978-3-319-89557-4_11
- Rego, A., Ribeiro, N., Pina e Cunha, M., & Jesuino, J. C. (2011). How happiness mediates the organizational virtuousness and affective commitment relationship. *Journal of Business Research*, 64(5), 524–532.
- Robinson, W. C., & Horlacher, D. (1971). *Population growth and economic welfare*. Population Council, New York.
- Rubaszek, M., & Serwa, D. (2014). Determinants of credit to households: An approach using the life-cycle model. *Economic Systems*, 38(4), 572-587. doi:10.1016/j.ecosys.2014.05.004
- Ryabov, I. (2015). On the relationship between development and fertility: The case of the United States. *Comparative Population Studies*, 40(4), 465–488. doi:10.12765/CPoS-2015-13en
- Safilios-Rothschild, C. (1972). The relationship between work commitment and fertility. International Journal of Sociology of the Family, 2(1), 64-71.
- Salah, G., Sjö, B., & Shahbaz, M. (2013). The causal nexus between financial development and economic growth in Kenya. *Economic Modelling*, 35, 701– 707. doi:10.1016/j.econmod.2013.08.031
- Schedler, A., Diamond, L., & Plattner, M. F. (1999). *The self-restraning state: power* and accountability in new democracies (Eds.). Boulder: Lynne Rienner.
- Schich, S. (2008). Revisiting that asset-meltdown hypothesis. OECD Journal: Financial Market Trends, 2008/2.
- Schmitz, S. W. (2005). Demographic developments, funded pension provision and financial stability. Financial Stability Report, Autrian Central Bank.
- Schultz, T. W. (1973). The value of children: As economic perspective. Journal of Political Economy, 81(2), S2-13 (Part II).
- Scott, A. (2000). Optimal consumption when capital markets are imperfect. Economics Letters, 66(1), 65-70. doi:10.1016/S0165-1765(99)00158-5
- Šević, A., & Brawn, D. (2015). Do demographic changes matter? A cross-country perspective. Journal of Multinational Financial Management, 30, 36-61. doi:10.1016/j.mulfin.2014.12.001

- Shahin, M. (2016). The effect of good governance mixture in governmental organizations on promotion of employees' job satisfaction (Case study: Employees and Faculty Members of Lorestan University). Canadian Center of Science and Education, 12(5), 108-117.
- Shand, J. M. (2008). The impact of early-life debt on household formation: An empirical investigation of homeownership, marriage and fertility (Doctoral Dissertation). Ohio State University.
- Shcumpeter, J. A. (1934). *The Theory of Economic Development*. Cambridge: Harvard University Press.
- Siliverstovs, B., Kholodilin, K. a., & Thiessen, U. (2011). Does aging influence structural change? Evidence from panel data. *Economic Systems*, 35(2), 244– 260. doi:10.1016/j.ecosys.2010.05.004
- Sobotka, T., Skirbekk, V., & Philipov, D. (2011). Economic recession and fertility in the developed world. *Population and Development Review*, 37(2), 267-306.
- Stevens, G. R. (1997). Some observations on low inflation and household finances. Reserve Bank of Australian Bulletin, October.
- Stiglitz, J. E. (2000). Capital market liberalization, economic growth, and instability. World Development, 28(6), 1075–1086. doi:10.1016/S0305-750X(00)00006-1
- Stroud, C., Walker, L. R., Davis, M., & Irwin, C. E. (2015). Investing in the health and well-being of young adults. *Journal of Adolescent Health*, 56(2), 127–129.
- Tabbarah, R. B. (1971). Toward a theory of demographic development. Economic Development and Cultural Change, 19(2), 257-276.
- Tan, Y., & Floros, C. (2013). Risk, capital and efficiency in Chinese banking. Journal of International Financial Markets, Institutions and Money, 26, 378-393.
- Tosun, M. S. (2008). Endogenous fiscal policy and capital market transmissions in the presence of demographic shocks. *Journal of Economic Dynamics and Control*, 32(6), 2031–2060. doi:10.1016/j.jedc.2007.09.013
- Tudela, M., & Young, G. (2005). The determinants of household debt and balance sheets in the United Kingdom. Working Paper Series, No. 266, Bank of England, England.
- Turinetti, E., & Zhuang, H. (2011). Exploring determinants of U.S. household debt. Journal of Applied Business Research, 27(6), 85-91.
- Turner, D., Giorno, C., De Serres A, V. A., & Richardson, P. (1998). The macroeconomic implications of ageing in a global context (No. 193). Economic Department Working Paper, OECD, Paris.

United Nation. (2015). World Fertility Patterns 2015. Data Booklet.

- United Nations. (2015). World population ageing 2015. United Nations, Department of Economic and Social Affairs, Population Division (Vol. United Nat). New York. doi:ST/ESA/SER.A/390
- Upadhyay, U., & Karasek, D. (2012). Women's empowerment and ideal family size: An examination of DHS empowerment measures in Sub-Saharan Africa. International Perspectives on Sexual and Reproductive Health, 38(2), 78-89.
- Varvarigos, D., & Arsenis, P. (2015). Corruption, fertility, and human capital. Journal of Economic Behavior & Organization, 109, 145-162. doi:10.1016/j.jebo.2014.11.006
- Vitaly, K. (2019). Before, during and after the sub-prime mortgage crisis in Israel. Israel Affairs, 25(2), 256–280.
- Wang, Q., & Sun, X. (2016). The role of socio-political and economic factors in fertility decline : A cross-country analysis. World Development, 87, 360-370. doi:10.1016/j.worlddev.2016.07.004
- Werding, M. (2014). Children are costly, but raising them may pay. Demographic Research, 30(8), 253-276. doi:10.4054/demres.2014.30.8
- Westerlund, J. (2007). Testing for error correction in panel data. Oxford Bulletin of Economics and Statistics, 69(6), 709-748.
- World Bank. (1993). The East Asian Miracle: Economic Growth and Public Policy Oxford. Oxford University Press.
- Yang, Y. Y., & Hoon, M. (2008). Does financial development cause economic growth? Implication for policy in Korea. *Journal of Policy Modelling*, 30(5), 827–840. doi:10.1016/j.jpolmod.2007.09.006
- Yasuoka, M., & Miyake, A. (2013). Public debt, child allowances and pension benefits with endogenous fertility. *Economics Discussion Paper*, 7(11), 1–25. doi:10.5018/economics-ejournal.ja.2013-11
- Zakaria, M., Ahmed Fida, B., Yousaf Janjua, S., & Hussain Shahzad, S. J. (2016). Fertility and financial development in South Asia. Social Indicators Research, 127(3), 1–27.
- Zhang, J., Wang, L., & Wang, S. (2012). Financial development and economic growth: Recent evidence from China. *Journal of Comparative Economics*, 40(3), 393-412. doi:10.1016/j.jce.2012.01.001
- Zhao, K. (2013). War finance and the baby boom. *Review of Economic Dynamics*, 1, 1-15. doi:10.1016/j.red.2013.09.003