The University of Nottingham

UNIVERSITY OF NOTTINGHAM

Household Portfolios

CHANGING DEMOGRAPHICS -

IMPLICATIONS FOR HOUSEHOLD PORTFOLIOS

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Abstract:

Households have a hump shaped income profile with respect to age, which means that younger households have lower income that increases with age, the income stabilizes in the middle years and starts to decline post retirement. The income lifecycle is inversely proportional to risk aversion which plays an important role in how households allocate assets in their portfolio, low in younger years and gradually increasing with age that reaches its peak before it starts to drop off post retirement. The main objective of this study is to explore demographic trends like changing age structure and its impact on variability in household portfolio asset allocation by reviewing the current literature and available household data.

Demographic Trends like 'Changing Age Structure and its Implication on Household Portfolio Asset Allocations'

"Investigation of household portfolio asset allocations in India"

(Word Count: 5179)

1. Introduction

1.1 Project Background

Changing age structure is an important demographic trend that influences macro-economic environment, public finances like social care systems, financial markets, real estate markets and household portfolios. While there is plenty of research on changing age structure and its impact on macro-economic environment, public finances and financial markets, the impact of changing age structure on banking business has been less studied. The life cycle implications of changing age structure will have a major influence on household portfolio asset allocations over next 20 years as many countries will be have a dramatic shift in their demographic aging structure.

SCB research team initiated a study to understand the changing demographic trends and its implications for banking industry in general and SCB in specific. The study program was divided into 2 parts, 1st part was the group study which was focused on identifying potential demographic trends globally and their implications on banking industry in general and SCB in specific, ranking the global markets with most opportunities in the order of intensity and recommending "high growth" proposition for product market positioning strategies of SCB (focus on Consumer Banking) over next 20 years, 2nd part being an individual study is focused on conducting further study of demographic trends like changing age structure and its implication on household portfolio management as an extension to the group study.

1.2 Project Summary

Households have a hump shaped income profile with respect to age, which means that younger households have lower income that increases with age, the income stabilizes in the middle years and starts to decline post retirement. The income lifecycle is inversely proportional to risk aversion which plays an important role in how households allocate assets in their portfolio, low in younger years and gradually increasing with age that reaches its peak before it starts to drop off post retirement.

Household portfolios generally contain financial assets[1], real estate assets[2] and liabilities[3] in varying proportion based on household characteristics like age, wealth, country, income level, time to retire, income risk, health risk, mortality risk, transaction costs tolerance, ability to borrow, housing scenario and access to retirement benefits like social security and pensions (Appendix 6.1).

The main objective of this study is to explore changing age structure and its impact on variability in household portfolio asset allocation by reviewing the current literature and available household data.

2. Approach & Methodology

2.1 Approach

The study will take a qualitative approach by reviewing past and current portfolio theory, household behavioral patterns and preferences literature, analyzing the secondary household data from central banks, census websites (India in particular) and available secondary regression results to test and identify trends & patterns in household portfolio asset allocation by age structures. The trends and patterns will be further used further to understand the implications of changing age structures on household portfolio asset allocation variability.

[1] like stocks, bonds and shares in mutual funds
[2] like primary residence, investment real estate and private business
[3] like mortgages and consumer debt

2.2 Methodology

Steps	*Methodology*	*Data Sources*	*Framework / tool*	*Report Section*
Introduction				
Project Background • *Project Background* • *Project Summary*				*Chapter 1, Section 1*
Design				
Methodology & Approach • *Literature review to understand the change in demographic structure implication on portfolio management*	*Primary / Secondary*	• *Interview with Business School's Economist and Finance Researchers* • *United Nations websites* • *Population Research Bureau (PRB) websites* • *IMF / World Bank websites* • *USDA, ERS Database Economic and Financial Research literatures*	• *graphing and inference*	*Chapter 2, Section 1*
Framework				
Literature Review • *Portfolio Theory* • *Household Portfolio Asset Allocation Behaviour* • *Household Asset Allocation Preferences*	*Primary / Secondary*	• *Economic and Financial Research literatures*		*Chapter 3, Section 1*
Evidence Investigation				
Empirical Evidence • *General Findings* • *Household Portfolio Asset Allocations in India*	*Secondary*	• *Reserve Bank of India* • *India Census* • *Market Research reports*	-	*Chapter 3, Section 2*
Conclusion & Recommendation				
Recommendations • *Utility Maximization* • *Portfolio Diversification* • *Ethical Portfolios* • *Need for Education*	*Secondary*	• *Economic and strategic literatures* • *Country findings from our group project*	-	*Chapter 4, Section 1*
Limitation & Further Research • *Major assumptions and limitation* • *Further research*	-		-	*Chapter 4, Section 2,3*
Conclusion				*Chapter 4, Section 4*

TABLE 2.1 PROJECT APPROACH

3. Literature Review

Households have a huge difference in their willingness to bear risk (Arrow, Pratt, 1964), although the influence of age is not very evident. There is an existing heterogeneity in household portfolio asset allocations and less than evident relationship between household age structure and their choice of assets in household portfolios. This literature review attempts to investigate the portfolio asset allocation choices of households in different age segments using available academic literature in portfolio theory, behavioral influences, individual preferences, ethical concerns and empirical evidence.

3.1 Portfolio Theory

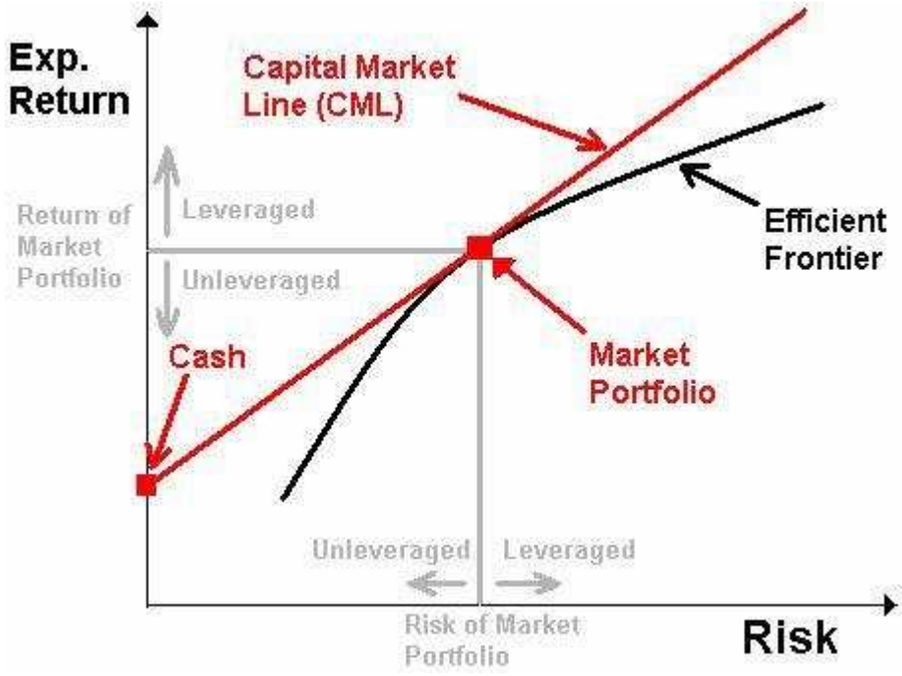

FIGURE 3.1: MARKET PORTFOLIO (SHAREWARE, 2010)

According to portfolio selection theory (Markowitz, 1952), all the household investors should hold the market portfolio where assets are held in a proportion that is neither under leveraged nor over leveraged (Figure 3.1).

According to two fund separation theorem (Tobin, 1958), all the household investors should choose to hold a risk free asset and market portfolio in different proportions, based on their risk-return appetite, if they can borrow and lend at the same riskless rate.

According to CAPM (Sharpe, 1964), all the household investors should hold the same portfolios called market portfolio of all tradable securities but in different proportions. CAPM only looks at one period ahead whereas the individuals have an option to change the portfolio allocation in the future which alters their behavior in the present.

According to portfolio consumption model (Samuelson, 1969), all household portfolio asset investment decision is same in all periods and households should hold the same assets in the same proportion at all time periods which implies that all households should hold the most efficient portfolio by choosing one risk free asset and one market portfolio irrespective of risk appetite.

As household portfolio assets are held over the lifetime, they are exposed to changes in interest rates, equity risk premium. To hedge against this exposure households should take a long/short position[4] in a third type of portfolio called covariance optimal portfolio that has the highest covariance with underlying investment conditions like changes in interest rates, and equity risk premium(Merton, 1970).

Households should maximize their expected utility by choosing risky and risk free assets in household portfolios (Merton, 1971). In the presence of labour income without any expected shocks, the households can treat some part of the income as risk free asset and leverage the cushion it provides to increase the proportion of risky assets like equity in their portfolios.

In the presence of moderate risk aversion households should choose to hold the proportion of risky and non risky assets evenly in the household portfolios (Friend, Blume, 1975).

In the presence of constraints on borrowing, income shocks, unemployment and portfolio restrictions, households should hold assets in their portfolio that will protect them against the shock (Deaton, 1991).

In the presence of constraints on borrowing, income shocks, unemployment and portfolio restrictions, the households tend to consume the random income and do not allocate any part of the income towards investing in new assets, households should hold assets that can act as a buffer to protect their consumption against the shock (Deaton, 1991).

[4] An asset allocation decision

The household portfolio asset allocation decision for younger households is highly influenced by housing (Flavin, Yamashita, 2002), in the presence of housing the younger households choose to hold low risk assets like bonds as compared to equity which is inconsistent with utility maximization and lifecycle theories.

In the presence of riskless social security and pensions, the households should hold more risky assets like equity, although social security and pensions are perceived to be important to household's decision of portfolio asset allocation, its impact on portfolio allocation is less known due to lack of research in the area (McCarthy, 2003).

3.2 Behavior

According to Permanent Income Hypothesis (Ando, Modigliani, 1963), household's consumption is dependent on their accumulated wealth and sum of their income over lifetime as well as their current income. Household's portfolio asset accumulation and allocation is dependent on the income over lifetime which means that households get less risk averse as they age increasing their propensity to hold risky assets like equity in their portfolio.

According to measures of risk aversion, households have constant, increasing or decreasing relative risk aversion that affects their portfolio asset allocation decision in risky and risk-free assets (Arrow, Pratt, 1964). Wealthier Households have a greater proportion of risky assets in their portfolios due to their decreasing absolute risk aversion. The households with decreasing absolute risk aversion tend to hold more risky assets like equity in their portfolios as compared to less wealthier households.

The households tend to hold increasing number of risky assets like stocks in their household portfolio as they age until retirement due to better understanding of asset classes which comes with age (King, Leape, 1987).

Younger households as well as households that are willing to postpone their retirement have an ability to take more risk as they can work longer[5] and make up for any unexpected loss (Bodie, Merton, Samuelson, 1992).

[5] Health permitting

There is some evidence that wealthy households have almost double the proportion of risky assets in their household portfolios as compared to the normal households (Carroll, 2001).

Household's prefer holding safe assets (Guiso, Haliassos, Jappelli, 2001, 2003), most of the households around the world do not hold equity in their portfolios directly or indirectly (US being the exception). This means households are either ignorant or highly risk averse which is inconsistent with the utility maximization theory that assumes perfect market where all the information is known and is acted upon by utility maximizing household investors. Since equity offers an equity premium as compared to other assets, all efficient portfolios should hold it in preference to the other assets (Mehra, Prescott, 1985).

As households age they tend to get wealthier and have decreasing absolute risk aversion which implies that such households have higher propensity to hold risky assets in their portfolio as they age, although evidence regarding the effect of age and resources on the choice of assets in household's portfolios is not consistent (Guiso, Haliassos, Jappelli, 2003).

Most households do not hold equity assets in their portfolios due to market participation cost (Haliassos, Michaelides, 2003). The other reasons for holding none to limited equity assets are attributed to factors like limited social interactions by households, limited opportunities to exchange stockholding experiences, awareness about different assets and low trust of others to manage household wealth (Guiso, Sapienza, Zingales, 2005). A study in Germany and Italy found that most of the households are unaware of stocks and other financial assets.

Tax laws play an important role in asset selection and asset location decision of households due to its impact on the overall portfolio value (Bergstresser, Poterba, 2004).

Household portfolio assets vary considerable from one household to the other, mainly due to household preference for particular assets or household circumstances that

restrict holding particular type of assets (Curcuru, Heaton, Lucas, Moore, 2004). Household circumstances are usually influenced by non-diversifiable factors like background risk[6], demographics[7], information asymmetry and transaction costs[8].

There is some evidence that retired households shift proportion of equity assets to cash and annuities (Ameriks, Zeldes, 2004). Although there isn't enough evidence of that being a trend, in general the shift from equity assets to cash or annuities is very small.

Household's asset allocation decision seems to be influenced by upswing and downtrends in the equity markets according to evidence in US as well as India during 1990's bull market (Bilias, Georgarakos, Haliassos, 2005a). Households allocated higher proportion of their investments to equity assets during the upswing and reduced the proportion of equity assets in the downtrend.

Household investors become less prone to behavioral bias as they grow older and become more experienced (Goetzmann, Kumar, 2005), they accumulate better investing wisdom that helps them make better household portfolio asset allocation decision. Although there is evidence of memory decline as people age (Schroder, Salthouse, 2004) that may negatively affect their ability to make right household portfolio allocation decision. Ageing makes people hold less risky portfolios, exhibit strong preference for diversification, trade less frequently and exhibit greater sensitiveness to loss increasing their propensity to hold less risky assets in their portfolio.

There is an observed inertia in retired household portfolios which implies that retired households by and large do not shift portfolio asset allocations often post retirement (Brunnemeier and Nagel, 2005), (Bilias, Georgarakos, Haliassos, 2005b) which means that households become increasingly risk averse and move away from risky assets in their portfolios post retirement.

Household portfolio asset allocation seems to be influenced by level of education, financial responsibility credentials and ethnicity, households with lower education and resources make many asset allocation mistakes like non-participation, under-

[6] Labour income, private business income, restricted pension investments and owner occupied real estate
[7] Age, occupation, inherited wealth and education
[8] Tax, fixed and variable cost of trading, time and psychic cost of learning about asset markets

diversification and lower debt refinancing which results in sub-optimal portfolio performance (Campbell, 2006).

3.3 Preferences

Younger household's consume more and invest less in assets, aging households consume less and invest more in assets whereas retired households gradually consume more and invest less in assets (Modigliani, 1985), a lifecycle hypothesis which means younger households will hold less assets in their portfolio than mid age household who will hold lower assets in their portfolio than retiring households.

Sensation seeking and impulsive individuals have more tolerance for risk than other individuals which implies that households with particular biological characteristics will hold more risky assets in their portfolio than other households (Harlow, Brown, 1990).

Household risk aversion is also attributed to race and gender, some empirical evidence suggests that risk aversion is lower in males and whites as compared to females and non whites which may affect their respective asset choice when they make portfolio asset allocation decision (Riley, Chow, 1992).

The demand for risky assets like equity increases with household age, younger households demand for housing is more than other households, as they grow old they pay off their housing loans and have more income to invest in risky assets like equity (Bakshi, Chen, 1994a)

According to the habit formation model (Gomes and Michaelides, 2002), households try to ensure the continuity of smooth consumption over time which leads them to accumulate wealth earlier in their life to protect against fluctuations in income. This implies that young households have a preference for utility maximizing behavior and they choose to hold assets with best payoff.

The risk characteristics of the household portfolios is hump shaped, which means that younger households have higher proportion of risky assets[9] in their portfolio in the their portfolio as compared to the aging households who tend to shift from holding risky

[9] like residential housing, mutual funds, stocks, long term government and corporate bonds, real estate and business equity

assets to low risk assets[10] (McCarthy, 2004). Although, there isn't a significant evidence of relationship between changing age and change in degree of risk aversion which is primarily attributed to the hump shaped household portfolio theory (Poterba, 2001).

3.4 Ethical Concerns

Households in Middle Eastern countries are increasingly interested in using financial products consistent with their religious beliefs that prohibits investments in non- Shari'a compliant products like interest earning deposits or 'riba', all forms of gains or profit that resulted from speculative or risky transactions that were not precisely calculable in advance which play an important role in households choice of assets that are based on fair dealing, risk sharing and equity (Walsh, 2008).

Households are increasingly concerned with ethics while choosing household portfolio investments than is believed (Read 2009). The concerns like 'saving the planet' dominate their asset allocation choice if they are made aware of sustainable investment themes as was discovered in UK where only 2% of the investments are ethical, in the presence of knowledge about sustainable investments, the interest jumps to 65%.

4. Empirical Investigation

Using available academic literature in portfolio theory, behavioral influences, individual preferences, respective ethical concerns, let's analyze secondary household data from central banks, census websites (India in particular) and available secondary regression results in order to understand the demographic trends like changing age structure and its impact on variability in household portfolio asset allocation decision.

[10] like Pensions, Life Insurance, Annuities, Cash, Liquid Accounts – Checking, Savings, Money Market and CDs

4.1 General Findings

Global evidence suggests that households are generally risk averse and they prefer safer financial assets (Appendix 6.1) in their portfolios around the world (Curcuru, Heaton, Lucas, Moore, 2004). The household risk aversion seems to be driven by their level of wealth, level of education and awareness of various financial markets. Due to the risk aversion, households have under diversified portfolio which results in allocation inefficiency and loss of portfolio value as market prices are discounted for diversifiable risk.

The determinants of assets in household portfolios are,

- Household Characteristics
    - Age
    - Education
    - Birth Year of Members
- Wealth
- Country

As these determinants differ from household to household the asset allocations vary significantly from one household portfolio to another contrary to literature which says all households should be utility maximizers (Markowitz, 1951) and they should hold the similar market portfolios with optimal proportion of risky and non-risky assets.

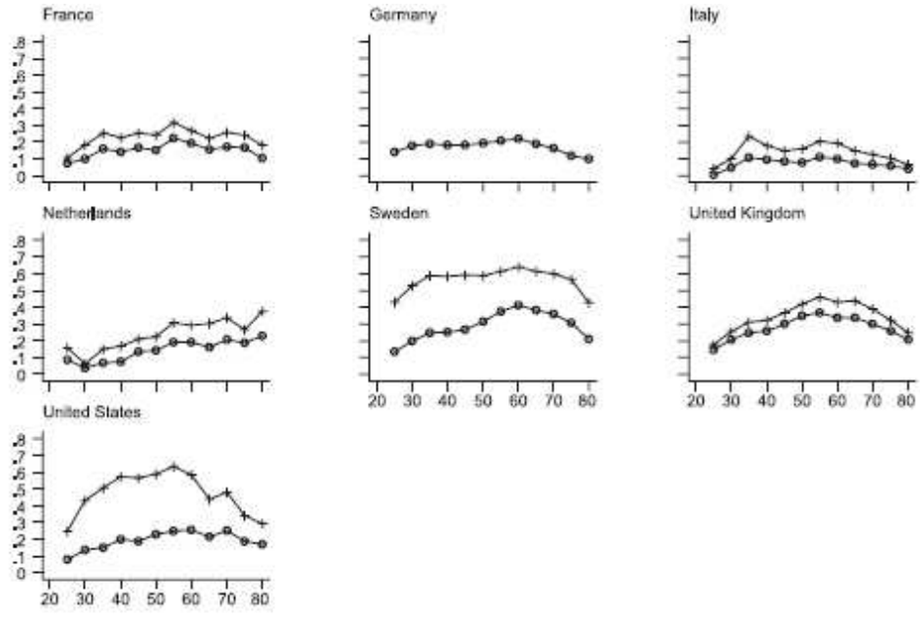

Figure 4.1.1: STOCK MARKET PARTICIPATION BY AGE (Massaro, Laakari, 2002)

Although there is some evidence of households that conform to lifecycle theory where proportion of risky assets like stock increases from younger age to pre retirement and starts to decline post retirement especially in countries like Sweden, UK and US, evidence in other countries like France, Germany, Italy suggests that investments in safe or low risk assets[11] are favored by households in most of the countries around the world. The data from Netherland paints a totally opposite picture where proportion of risky assets is higher post retirement (Figure 4.1.1).

Global evidence also suggests that households prefer to keep their portfolio simple and hold fewer than 5 different assets or accounts. For example, in US on average households held 3 different types of assets in 1998 (Bertaut and Starr-McCluer, 2002).

According to two fund separation theorem, all households should hold the same portfolio of risky assets varying only in the fraction of their net worth that is held in a risk free asset in order to obtain their desired balance of risk and premium (Canner et al, 1997). Households around the world with different age structure have different portfolio asset preferences, show high risk aversion to risk, and are skewed towards risk free assets.

Merton-Samuelson implied that investor's optimal portfolio is independent of the time to the end of their expected life meaning household's optimal portfolio is independent of

[11] Bank accounts like Checking, Savings accounts, time deposits and life insurance

household investor's age. Households are skewed towards risk free assets at all times although they ignore risky assets like stocks despite its equity premium.

U.S. Common Stock Ownership by Age Group, 1983-1995

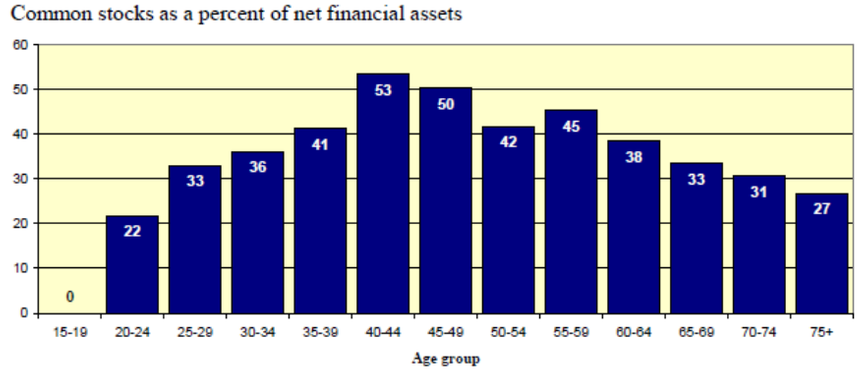

FIGURE 0.1.2: SNAPSHOT OF STOCK HOLDING TREND BY AGE IN US (BOSWORTH, BRYANT, BURTLESS, 2004)

There are some evidence that portfolios do vary by age but the variation is neither as per the popular hump shaped belief[12] nor as per the optimal portfolio path[13](Figure 4.1.2). According to a study in US, age 40-44 household portfolios increasingly held risky assets like stocks until age 55-59, after which the proportion of risky assets started to decline. It is contradictory to the general belief that the amount of risky assets held in household portfolios falls with age; it also doesn't conform to Merton-Samuelson implication that risky asset holding should remain same despite age.

Treasury bill yields offer the best evidence of correlation between age structure and demand for particular types of assets by households. Lower Treasury bill yields have been observed in countries with large share of population in saving years of 40-64, which suggests that there is a large household demand for saving assets (Yoo, 1994).

Demand for risky assets like equity in countries with majority population in 20-39 years is ½ of the demand for risky assets in countries with majority population in 40-64, which suggests that the demand for risky assets is low for young age households and it increases as the household age increases, which is a strong evidence of correlation between age structure and household choice of asset in their portfolios (Davis, Li, 2003).

[12] As suggested in Life Cycle Hypothesis
[13] As suggested by Merton-Samuelson

There is also a relationship between age of the demographics and stock market participation, in a study of 14 OECD countries, it was discovered that large population in 45-65 year age segment resulted in higher demand for equity assets in 11 out of 14 OECD countries, which suggests that preference for a particular asset type is influenced by age structure (Brooks, 1998).

4.2 Household Portfolio Asset Allocation in India

We identified India as the country with highest potential from population growth as well as GDP growth point of view over next 20 years in our group study. India is expected to enter a demographic window where the proportion of working age population will be extremely high and is expected to enjoy a demographic dividend that will last for few decades which usually results in greater economic activity, boost in productivity and high consumption during the period of demographic window (Figure 4.2.1). Let's now consider a household portfolio asset allocation behavior in India and evaluate it against the age structure.

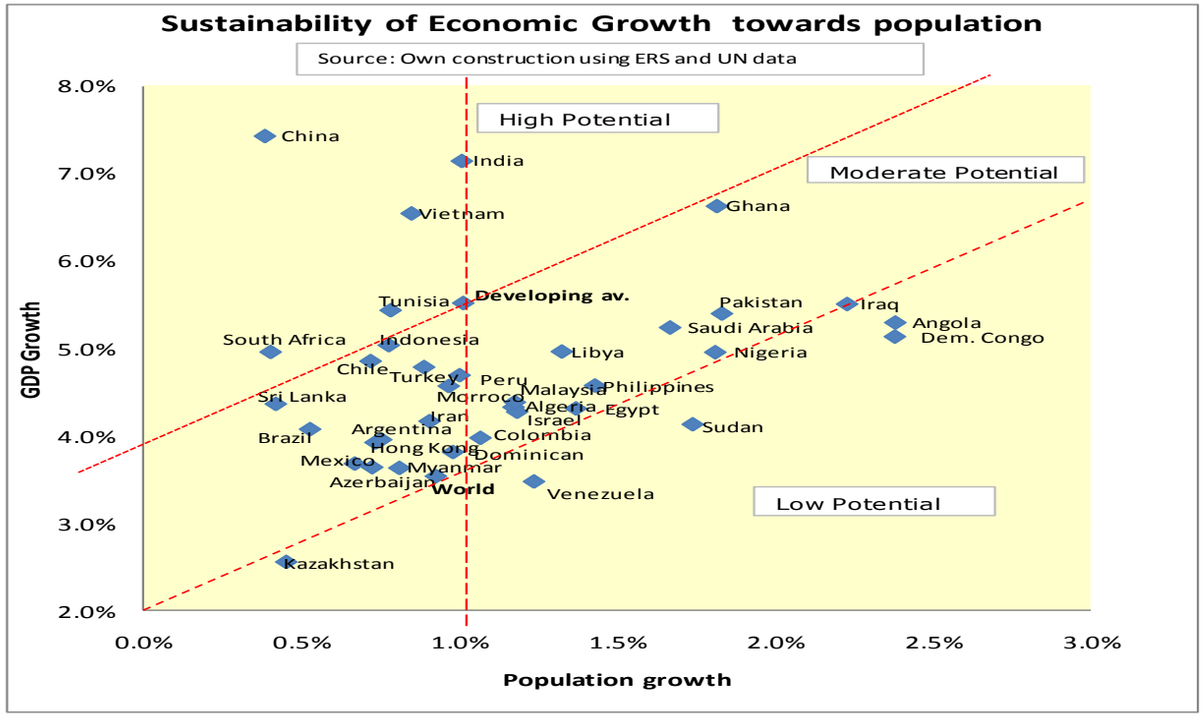

FIGURE 0.2.1: SUSTAINABILITY OF ECONOMIC GROWTH AGAINST POPULATION GROWTH

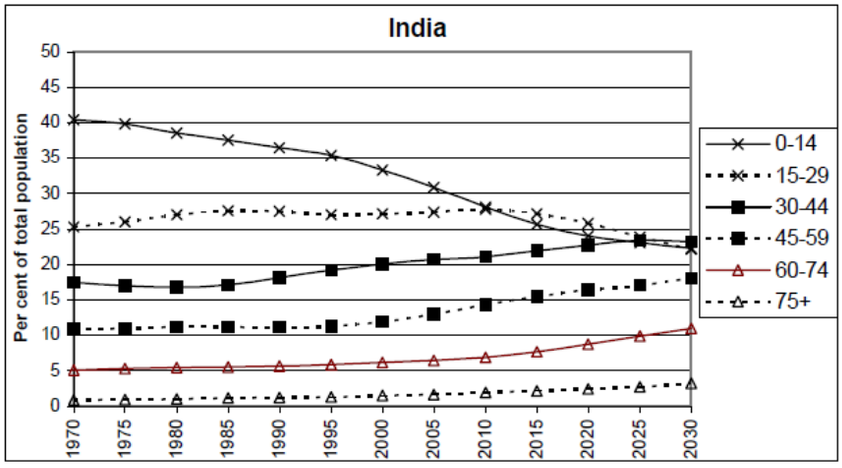

FIGURE 0.2.2: DEMOGRAPHIC AGE STRUCTURE TREND IN INDIA BY AGE (RBI, 2010)

The percentage of working age population in 15-29 age range has been relatively constant, whereas the percentage of population in 30-59 age range has been rising over the years and is expected to continue to grow until 2030 (Figure 4.2.2).

Safe	Bank Deposit
Fairly Safe	Provident and Pension Fund
Risky	Stocks, Non Banking Deposits, Life Insurance Funds and Mutual Funds

TABLE 4.2.1: RISKINESS OF VARIOUS ASSET TYPES IN INDIA (DERIVED FROM RBI HOUSEHOLD DATA)

Indian household portfolios generally contain assets like banking deposits, non-banking deposits, life insurance funds, provident and pension funds, government claims, stocks, mutual funds and trade debt that can be generalized into Safe, Fairly Safe and Risky categories (Table 4.2.2).

Year	Currency	Bank Deposits	Non-banking Deposits	Life Insurance Fund	Provident and Pension Fund	Claims on Government	Shares & Debentures	Units of UTI	Trade Debt (Net)	Changes in Financial Assets (2 to 10)
1	2	3	4	5	6	7	8	9	10	11
1970-71	355	754	67	207	490	105	68	14	50	**2110**
1974-75	18	1654	92	344	787	72	62	-3	345	**3371**
1979-80	1332	4659	477	773	1748	531	253	41	435	**10249**
1984-85	2938	9859	960	1556	3759	3107	762	567	41	**23549**
1989-90	7655	13987	1839	4415	9508	6758	2655	2179	-763	**48233**
1994-95	15916	55835	11547	11370	21414	13186	13473	3908	-1148	**145501**
1999-00	20845	82892	3844	28644	53907	28985	16308	1811	-1023	**236213**
2004-05	36977	158259	3370	67986	56552	106420	8113	-3146	-213	**434318**
2008-09	93056	409811	13453	150337	70891	-23479	22086	-2737	13446	**746864**

TABLE 4.2.2: CHANGES IN HOUSEHOLD PORTFOLIO ASSET ALLOCATIONS IN INDIA (1970 -2009), IN 10 MILLION RUPEES (RBI, 2010)

The central bank in India collects household sector data since 1970, which is a good indicator of household portfolio asset allocations in general (Table 4.2.3).

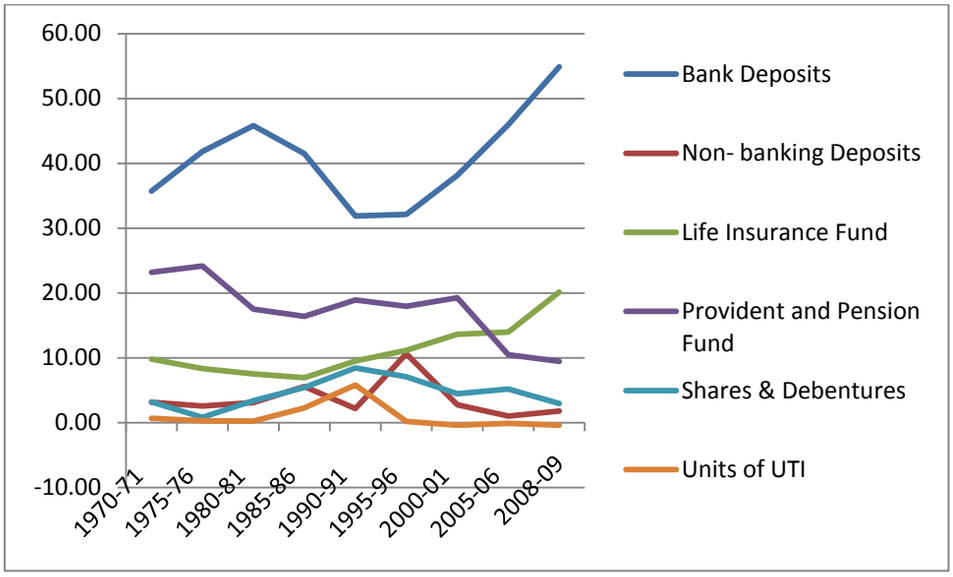

FIGURE 0.2.3: INDIAN HOUSEHOLD ASSET HOLDINGS BY ASSET TYPES (DERIVED FROM RBI HOUSEHOLD DATA, 2010)

Indian households seem to have a constant risk aversion (Arrow, Pratt, 1964). The household portfolio asset allocations in India over last few decades (1970-2009) have focused on safer assets than risky assets despite younger population; frequent occurrence of background shocks seems to be more important in household choice of an asset in their portfolios than the age structure.

Indian households prefer holding safe assets (Guiso, Haliassos, Jappelli, 2001, 2003). Bank deposits which are considered safe have increased in household portfolio as compared to non-bank deposits that have declined consistently in household portfolios since 1970 probably due to income uncertainty and low deposit safety in non-bank deposit taking institutions (Figure 4.2.3).

Health issues seem to be important to household's decision of portfolio asset allocation (McCarthy, 2003), life insurance assets have steadily increased in household portfolios since 1970 probably due to poor social healthcare and social care systems.

Provident and Retirement funds that were held widely in household portfolios have declined since 1970, probably due to constraints (Deaton, 1991) like inability to withdraw from these accounts until retirement (Figure 4.2.3).

Stocks haven't been really popular as an asset in household portfolios due to constant risk averse culture, although they became relatively popular during the 1990's equity market boom as households were attracted to hold them due to higher returns but subsequent downturn resulted in decline in the attractiveness of stocks in household portfolios (Bilias, Georgarakos, Haliassos, 2005a), (Figure 4.2.3).

UTI mutual funds represented a market portfolio, an initiative by government of India to attract the small investors. The initiative seems to succeed initially, have consistently dropped out of favor and exhibits a declining trend probably because of the uptrend-downtrend effect in the stock markets (Bilias, Georgarakos, Haliassos, 2005a), (Figure 4.2.3).

Evidence of portfolio asset allocation in India suggests that households prefer to invest in safe and relatively safe assets irrespective of age. There is some evidence of hump shaped profile in life insurance assets although it may be due to other factors.

The proportion of risky assets like stocks in household portfolio is almost negligible in all household portfolios, with a sole exception of market boom when the investment in risky assets like stocks and mutual funds increased, although it subsequently fell during the downturn.

5. Recommendations & Conclusion

5.1 Recommendations

5.1.1 Utility Maximization

Contrary to the optimal portfolio theory argument, most households around the world do not hold stocks in their portfolio despite the equity premium that stocks offer, households should be utility maximizers and they should hold the assets that offer the best payoff for the amount of risk taken by households in holding them. Equity offers a

premium over all other asset classes and households should consider it when making asset allocation decision.

5.1.2 Portfolio Diversification

Present evidence in countries like India, Germany and Italy suggest that households are generally risk averse and tend to under hold available asset types especially stocks (Appendix 6.3) whereas in countries like US households have relatively better diversified portfolios (Appendix 6.2). Households around the world need to diversify their portfolio in various available asset categories in order to maximize the utility of their investments.

5.1.3 Ethical Portfolios

Sub-prime meltdown, subsequent recession, global warming, ethical issues and concerns about sustainability has been some of the factor that are growing in importance for aging households, aging households are questioning the merit of utility maximization, free markets profiting at the expense of growing social, environmental and economic issues. 'Is there an ethical asset that can use my available resources and funds to create better tomorrow for all of us?' is the kinds of questions that are growing in importance when household make asset allocation decisions. The growing numbers of successful portfolios that are merging these concerns along with the most efficient portfolio are becoming popular amongst households and they seem to be the way forward.

5.1.4 Need for Education

Empirical study in Germany and Italy have found that large number of households are not aware of the full set of financial assets that they can consider before making asset allocation decisions for their portfolio. This may be due to the low financial market education which leads to households making many errors in asset allocation decision, it is necessary to educate them further about the availability and utility of various asset types.

5.2 Limitations

This study uses individuals and households interchangeably. Most portfolio theories omit important factors like effect of change in household health, effect of bequests that younger households receive from their parents and changing attitude and preferences towards work of aging households on asset allocation decision.

Most theories do not take into account the existence of social care systems like old age pensions, long term care and healthcare. They also tend to ignore the implication of taxes in household portfolio asset allocation decision.

This study was limited by the availability of the detailed data on the financial asset holdings by households in India.

5.3 Further Research

As more and more countries are increasingly facing the transition in age structure it is imperative that there is a better understanding of the demographic trends like changing aging structure and its impact on household portfolios. The differences between the theory and the empirical evidence suggest that the exact nature of relationship between various age structures and household portfolios need to be understood further and they should be the focus of the more research

No single theory has successfully explained all the different observed asset allocation decisions by households with different age structures. Many key issues need to be explored further before we have a full understanding of how various age structures affect household portfolio asset allocation decision.

The public policy choices by various countries have a significant impact on the portfolio asset allocation decision by the households and they need to be studied further.

The households who own their own business will have different sets of priorities like considering business returns before making asset allocation decision that needs to be considered further.

Empirical evidence suggests that there is a fair amount of information asymmetry where the population is not aware of various available assets; the theoretical research needs to consider that in the various portfolio theory models

5.4 Conclusion

We examined various portfolio theories, behavioural theories, preferences and empirical evidence about how demographic trends like changing age structure impacts household asset allocations. Most theories suggest that household asset allocation behaviour is strongly influenced by household preferences, presence of background risk, income level, wealth, borrowing constraints and housing.

There are substantial differences in portfolio asset allocations by households around the world, majority of the households do not hold risky assets in their portfolio whereas others hold significant risky positions in their portfolio (Appendix 6.1). Although there is some evidence that demographic age structure affects the choice of household demand for particular assets, countries like India show totally opposite behaviour than expected by their demographic profile. The demographic effect differs from country to country and the evidence that supports the correlation between age structure and households choice of household asset allocation is less than evident.

Due to less than perfect correlation between age structure and how households choose assets, there is no general trend that banks can use to capture the business opportunities that changing household portfolios represent universally. 'One Size Fits All' will not be an option as far as the portfolio management business is concerned. Banks will need to tailor portfolio management business strategies according to household portfolio asset allocation trends in each country.

6. Appendix

APPENDIX 6.1: TYPES OF ASSETS IN HOUSEHOLD PORTFOLIOS

Types of assets and liabilities in household portfolios	
Financial assets	**Non-financial assets**
Liquid accounts (checking, saving, money market deposit accounts)	Primary residence
Certificates of deposit (time accounts)	Investment real estate (residential and nonresidential)
Government bonds	Business equity (privately owned, with or without management role)
Other bonds (including corporate and foreign bonds)	Other non-financial (mainly vehicles and recreation tools, artwork, antiques, furniture, valuable collections)
Stocks (directly held)	
Mutual funds (excluding money market funds)	**Liabilities**
Retirement accounts (individual and employer-sponsored)	Mortgage and home equity
Cash value of life insurance	Loans for investment real estate
Trusts and other managed assets (including managed investment accounts)	Credit card balances
Other financial assets (e.g. royalties, futures contracts)	Other debt (home improvement loans, student loans, vehicle loans, unsecured credit lines, loans against pension and life insurance policies)

Risky Asset Definitions	
Direct stockholding	Shares held directly.
Direct and indirect stockholding	Shares held directly, mutual funds, investment accounts, retirement accounts. Except for the U.S., information on the specific types of mutual funds and investment accounts is not available, and one cannot disentangle indirect stockholding in mutual funds and managed investment accounts from investment in other financial assets. For this reason the reported figures overestimate the true value of indirect stockholding. In Germany there is no information on pension funds.
Risky financial assets	In the U.S. direct and indirect stockholding, plus corporate, foreign and mortgage-backed bonds. In the U.K. direct and indirect stockholding plus corporate bonds. In the Netherlands direct and indirect stockholding, but excluding defined-benefits pension funds. In Germany direct and indirect stockholding plus foreign bonds. In Italy direct and indirect stockholding plus long-term government bonds and corporate bonds.
Total risky assets	Risky financial assets, business, investment real estate. In Germany there is no information on investment real estate in wave 1983 of the Income and Expenditure Survey, and no information on business property in 1993. In the U.K. there is no information on real assets.

FIGURE 6.1.1: INDIAN HOUSEHOLD ASSET HOLDINGS BY ASSET TYPES (GUISO, HALIASSOS, JAPPELLI, 2001, 2003)

APPENDIX 6.2: STRUCTURE OF US AND UK HOUSEHOLD PORTFOLIOS

Table A1: Structure of US and UK household portfolios

	US (1994)	UK (1995)
Net Home Equity	34%	60%
Other Real Estate	18%	10%
Net Vehicle Wealth	8%	4%
Tangible Assets	*61%*	*75%*
Stocks and Mutual Funds	22%	10%
Liquid Assets	15%	13%
Other Financial Assets	7%	5%
Other Debts	5%	2%
Net Financial Assets	39%	25%
Total Wealth	1995 US $131600	1995 US $90800

Source: Banks *et al* (2002)

FIGURE 6.2.1: STRUCTURE OF US AND UK HOUSEHOLD PORTFOLIOS (DERIVED FROM BANKS ET AL, 2002)

APPENDIX 6.3: STRUCTURE OF OECD HOUSEHOLD PORTOLIOS

Table A7: Assets held by households, OECD countries

	US 1998	UK 1996	Italy 1998	Germany (W) 1993	Netherlands 1998	Japan 1999
Financial Assets	93				95	
Liquid Accounts	91	78	83	99	93	
Govt Bonds		25	15	11	4	
Life Insurance		38	23	62	23	
Mutual Funds	17	12	11	12	22	5
Retirement Accounts	48	30	7		18	
Stocks	19	22	7	12	15	24
Primary Residence	66	60	66	47	51	39
Investment Real Estate	19		26		4	
Business Equity	12		12		5	
Mortgage	43	32		27	43	
Credit cards	44					
Other debt	49	14				

Source: Guiso *et al* (2002), Iwaisako (2003)

FIGURE 6.3.1: STRUCTURE OF OECD HOUSEHOLD PORTFOLIOS (DERIVED FROM GUISO ET AL, 2002, IWAISAKO, 2003)

APPENDIX 6.4: HOUSEHOLD ASSET ALLOCATION TREND BY AGE

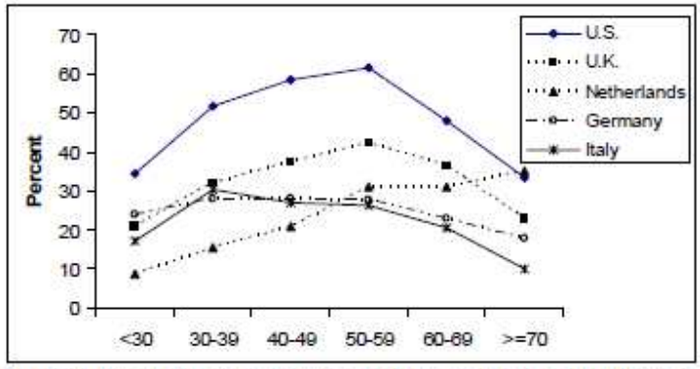

Figure 1 International Risky Financial Assets Participation by Age
Source: Guiso, Haliassos and Jappelli (2000, p.28, Table 5)

FIGURE 6.4.1: HOUSEHOLD ASSET ALLOCATION TREND BY AGE (GUISO, HALIASSOS, JAPPELLI, 2000)

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