An Analysis into the Behavioral Nature of Capital Formation Through Investments in India

#Dr D Appala Naidu[1], Hardik Sharma[2] ,
[1]Department of Economics, Atma Ram Sanatan Dharma College, Dhaula Kuan, University of Delhi, New Delhi
[2]Department of Statistics, Indian Statistical Institute, Kolkata.
#E-mail: danaidu@arsd.du.ac.in

Abstract:

Savings and investments are vital not only for families but also for the advancement of the country. In many economies investment decisions are not based upon borrowing rather the character of Investments changed in the labor consumerist society where investments became the norm and every person in some or the other form try to invest through his savings or even through his current income. This paper mainly aims the study is to analyse what neural behaviour is required in case of trade-offs between consumption investments and savings decision and whether individuals take into account like a rational agent. Correlation study is used to determine the relationship between two or more continuous variables among a single group of people. The low correlation coefficient between per capita net national product and savings-investment shows that the conversion ratio of growth to investment has been quite low with only the richer segment of the society. Another factor which affects the proper relationship between savings and investments is the functioning of the Black Economy, because it acts as a lure for people to diversify their holdings

Keywords: Savings, consumer, borrowings, regression, investment & correlation.

1. Introduction:

Savings and investments [1] are vital not only for families but also for the advancement of the country. Investment plays a major role in the development of a nation to a greater extent. From the modernization concept [2] direct, foreign and private investments in developing economies as an asset to the country. The economic development of a country largely depends on its industrial and commerce activities. Way back in the early 1930s, the eminent economist Lord John Maynard keynes postulated exciting propositions about an individual's behaviour and modeled his theory of investments and savings on the basis of the assumption that people borrow in order to invest .[3]This theory worked an excellent deal during the war time periods and even continuing up to the 1970s when the fruits of the second industrial revolution were being repeated by the majority of the Nations. [4] Moreover, since the majority of the Nations had majority of the populations in

the lower middle income ranges it automatically implied that people needed to borrow in order to invest. [5] However post 1980s and 1990s, as the type and character of financial instruments has diversified in accordance with the education levels and opportunities opened up to people by the coming of the third industrial revolution we see that in many economies investment decisions are not based upon borrowing rather the character of Investments changed in the labor consumerist society where investments became the norm and every person in some or the other form try to invest through his savings or even through his current income. However the strength of Keynes hypothesis [6] is yet to be challenged in most of the major economies and it is of quite a theoretical as well as behavioral interest to analyze whether this hypothesis holds in a country like India and what are the implications and do the neurological tendencies behind investment decisions.

2. Review of literature:

Colin F Camerer (2007) says that macro models explore how the result of brain activity has a multiplier effect in the economy.It remains to be seen whether neural measurement will be useful for understanding macroeconomic phenomena like consumer confidence or stock market bubbles. However many of these macro phenomena spring from the interaction of many brains that are tightly linked through social networks and common responses to emotional and news shocks which can be reciprocal or contagious.

Paul Meehl(1960) argued that the human mind is cognitively weak at statistics and complex mathematical calculations which affects its tendencies to act in an optimising way or in a rational way and this concept can be proliferated to the basic life decisions like Investments and consumption.**Amos tversky and Daniel Kahneman (1998)** argued in their seminal work in behavioural economics that the system 1 which is based upon intuition has a tendency to recruit the most easily available information at the time of decision making because effort is not a preferable state and system 2 activation and work requires effort this is deeply rooted in our evolutionary basis. Our amygdala which is the caution region has an innate tendency to recognise objects of fear ,for example, if you have recently seen a car accident then that thing always stays in your memory for a medium duration when you drive and you are sometimes overcautious. The same thing happens when we take into consideration Investments. Widely disseminated events like the global financial crisis had a long lasting impact on housing investment decisions and which can be quite clearly observed in the Indian economy as well as the availability bias is at work here. **Richard Thaler and Cass Sunstein**(2017**) in** their best selling work Nudge explained the status quo bias at work when making important investment decisions. According to it a person has a tendency to stick to an investment decision for very long terms simply because deviation from the norm requires effort and hence is retarded. Hence people always suffer from a problem of self control which affects their capability to act rationally in demanding situations, for example, most of the people don't consider looking back again at the returns they accrue from the investments made for after-retirement and many of them are even very much late when the time comes to invest and hence they suffer. Another example from the stock markets to mention is of the people who invested in their own companies shares and the saliency bias explains that people often overweight their own prospects and hence are employed in complicated decisions.**TG Dousalgas(1960)** in his bestselling work the key to economic progress advocated the labour

consumer capitalist economy prevalent in the American circles where the labour is not only a part of the production function but is viewed as a probable consumer as well as investor in the stocks of the company and hence the company changes from being in the conventional capitalist system which often puts pressure on its labour to being a new kind of neoclassical framework where labour is put as your producer as well as your consumer. He explained how this kind of capitalist economy led to a change in investment trends with mutual funds adopted across portfolios and the change of investment from being an activity e of last resort that often people did using excess wealth to rather an activity which everyone set up as a norm in their working lives.

2. Research Design

Aim of the study is to analyse what neural behaviour is required in case of trade-offs between consumption investments and savings decision and whether individuals take into account like a rational agent all of the available information in form of interest rates the rate of inflation the rate of depreciation or whether it is a neural subjective nonlinear probability weighting of these components which results in the given investment decisions.

Correlation study is used to determine the relationship between two or more continuous variables among a single group of people. A correlation has direction, and correlation coefficient (r) can be either positive or negative. Zero indicates no relationship between the two variables, and $r = 1$ or $r = -1$ indicate a perfect relationship. The strength can be anywhere between 0 and ±1.[7-9] Paul Meehl[10] in his seminal work titled clinical versus statistical predictions argued that the human mind is cognitively weak at statistics and complex mathematical calculations which affects its tendencies to act in an optimising way or in a rational way and this concept can be proliferated to the basic life decisions like Investments and consumption. Daniel Kahneman argues that we have a tendency to substitute difficult questions by answering an easier one and this tendency is called heuristics. The main concept in the paper is the role of depreciation in affecting investment decisions as well as explaining the factors that why India does not show that kind of deviation from Keynes postulated behavior. Secondary data is collected from Reserve bank of India database on Indian Economy from 2005 to 2019 on annual growth rate and percentage of GDP in the years.

TABLE 1: SECONDARY DATA INDIAN ECONOMY FROM 2005 TO 2019

Year	Annual Growth Rate					As % of GDP			
	GVA at Basic Price	Gross Domestic Product	Gross National Income	Net National Income	Per Capita NNI	Gross savings	Net savings	Gross Capital Formation	Net Capital Formation

2018-19	10.5	11.0	11.0	10.8	9.7	30.1	19.7	32.2	21.8
2017-18	11.1	11.1	11.2	11.2	9.9	32.4	22.1	34.2	23.9
2016-17	11.1	11.8	11.8	12.0	10.6	31.3	21.0	32.0	21.6
2015-16	9.3	10.5	10.5	10.8	9.4	31.1	20.6	32.1	21.6
2014-15	11.0	11.0	11.1	10.9	9.5	32.2	21.5	33.5	22.8
2013-14	12.6	13.0	12.9	12.9	11.5	32.1	21.5	33.8	23.1
2012-13	13.5	13.8	13.5	13.2	11.9	33.9	23.2	38.7	28.0
2011-12	14.4	14.4	14.7	14.6	11.4	34.6	24.1	39.0	28.5
2010-11	18.6	19.9	19.3	19.8	18.2	36.9	26.5	39.8	29.4
2009-10	15.5	15.5	15.5	15.4	13.8	36.0	25.2	38.9	28.0
2008-09	15.2	12.6	12.4	11.9	10.3	36.0	25.3	38.4	27.6
2007-08	15.0	15.1	15.6	15.5	13.9	37.8	27.4	39.1	28.7
2006-07	17.4	17.1	17.1	17.3	15.6	34.9	24.6	36.0	25.7

2005-06	14.6	14.0	14.0	14.0	12.2	35.2	24.7	36.4	26.0
SOURCE: - RESERVE BANK OF INDIA DATABASE OF INDIAN ECONOMY (Various Years)									

From table 1 the fall in investment rates post 2011 may be ascribed to the fact that post the global financial crisis of 2008 many people suffered enormous losses especially in the real estate and NBFC sector. The behavioral concept to look out for the capital depreciation rates as a percentage of GDP which clearly indicate that Indian investments are not up to productivity levels.The exception of per capita net national product growth has been considerably low compared to overall standards.

Table 2:AN ANALYSIS INTO PROBABLE RELATIONSHIPS USING CORRELATION ANALYSIS

	GVA	*GDP*	*GNP*	*NNI*	*PCNNI*	*GS*	*NS*	*GCF*	*NCF*
GVA	1								
GDP	0.94106084	1							
GNP	0.93937351	0.99567247	1						
NNI	0.91525059	0.99319009	0.99614921	1					
PCNNI	0.89091381	0.98141125	0.9765075	0.98344296	1				

GS	0.87025635	0.77157153	0.79227568	0.75613858	0.72212377	1			
NS	0.87616001	0.78505112	0.80737893	0.77454293	0.74090298	0.99751003	1		
GCF	0.82239795	0.74035511	0.74935113	0.70190011	0.64489779	0.91328526	0.89935704	1	
NCF	0.83370181	0.75839994	0.76900509	0.72401468	0.66623611	0.91900878	0.90934433	0.99794376	1

From the table 2: depict that the low correlation coefficient between per capita net national product and savings-investment shows that the conversion ratio of growth to investment has been quite low with only the richer segment of the society playing its part in it.

It is indicative of the trend that depreciation affects savings and investment attitudes to a large extent especially in the middle income segment where risk averseness creeps in quickly when people are confronted with losses

The low correlation coefficient between per capita net national product and savings-investment shows that the conversion ratio of growth to investment has been quite low with only the richer segment of the society playing its part in it and majority shirking away from adventurous projects. The low correlation coefficient between Gross domestic product and savings-investments and the relatively higher correlation between net figures and savings-investments is indicative of the trend that depreciation affects savings and investment attitudes to a large extent, especially in the middle income segment where risk averseness creeps in quickly when people are confronted with losses(Adam Hayes et,. a).

Table 3:Regression Analysis

Regression Statistics

Multiple R	0.913285 26
R Square	0.834089 96
Adjusted R Square	0.820264 13
Standard Error	1.259016 39
Observations	14

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	95.627818 5	95.627818 5	60.328354 8	5.081E-06
Residual	12	19.021467 2	1.5851222 7		

Total	13	114.649286

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-2.618437	4.984322 92	-0.525334 5	0.608920 73	-13.47834 4	8.241469 77	-13.47834 4	8.241469 77
X Variable 1	1.139637 76	0.146725 67	7.767132 99	5.081E-06	0.81995	1.459325 52	0.81995	1.459325 52

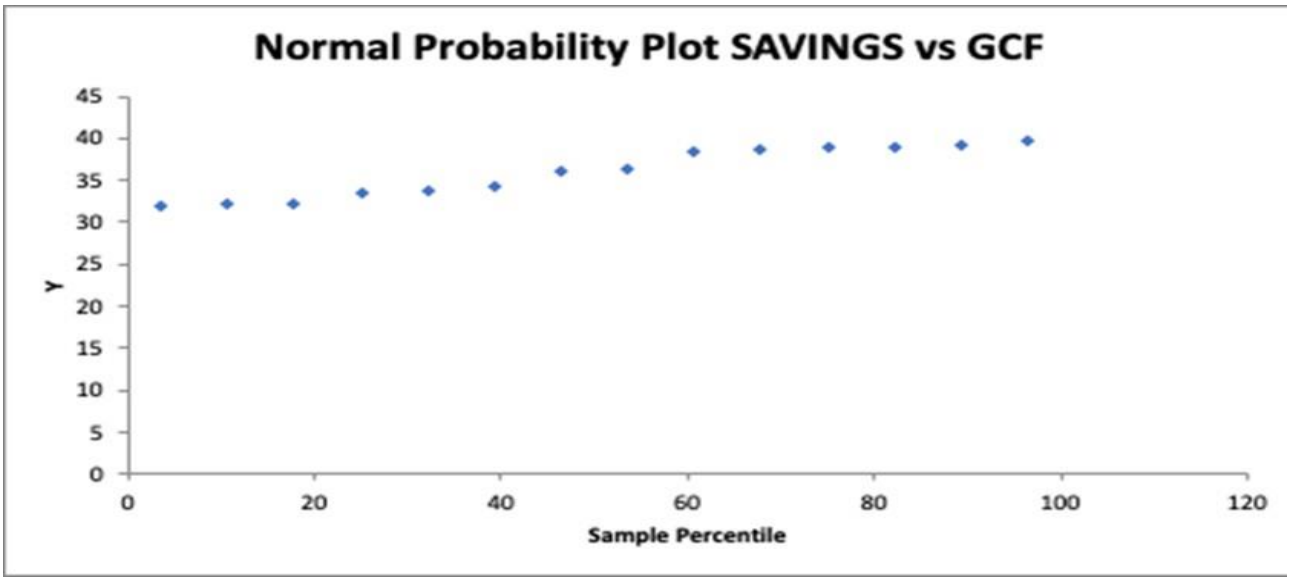

Fig 1: Normal Probability plot savings Vs GCF

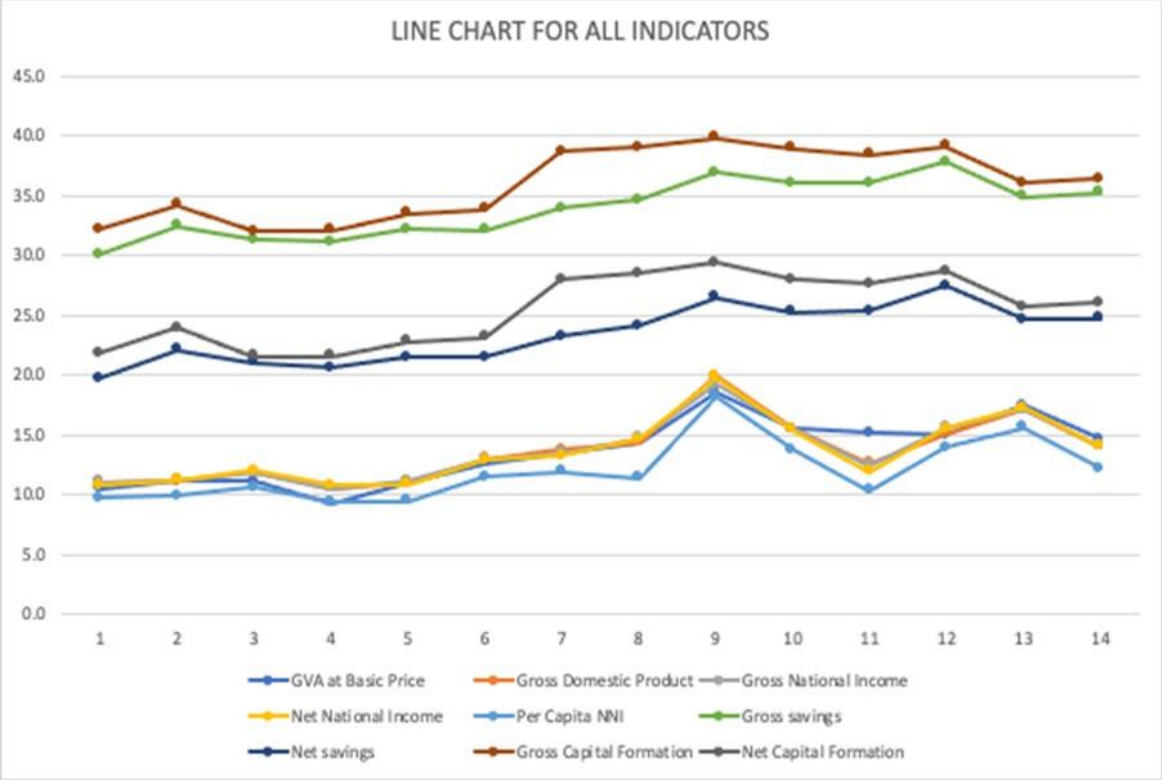

Fig 2: Line chart for all indicators.

From Fig 3 the expected horizontal plot indicates the equality of savings and investments, however for a growing economy it is a major point of concern that why is this happening that investments and savings are not showing a good linearly upward trend despite double digit growth rates.

Lord John mynard Keynes based his model on the fact that PEOPLE BORROW IN ORDER TO INVEST. Hence inflows into the financial markets are always in a state of dynamic equilibrium with outflows from the financial markets, which is checked upon by effective government policy in times of disequilibrium.

We notice that savings and capital formation in the economy are considerably correlated with quite a horizontally linear normal probability plot which shows that for a country like India in which the majority of population structures lie in the lower-middle income segments, usually risk averse in nature, people do borrow to invest and hence the equilibrium between savings and investments is maintained in the medium run but NOT IN A PERFECT FASHION.

In positively skewed income regimes as in India we do see that population growth does tend to limit the growth in investment attitudes over time, since people unfavorably weigh the negative prospects of a loss considerably more high than the prospects of a gain in lucrative investment

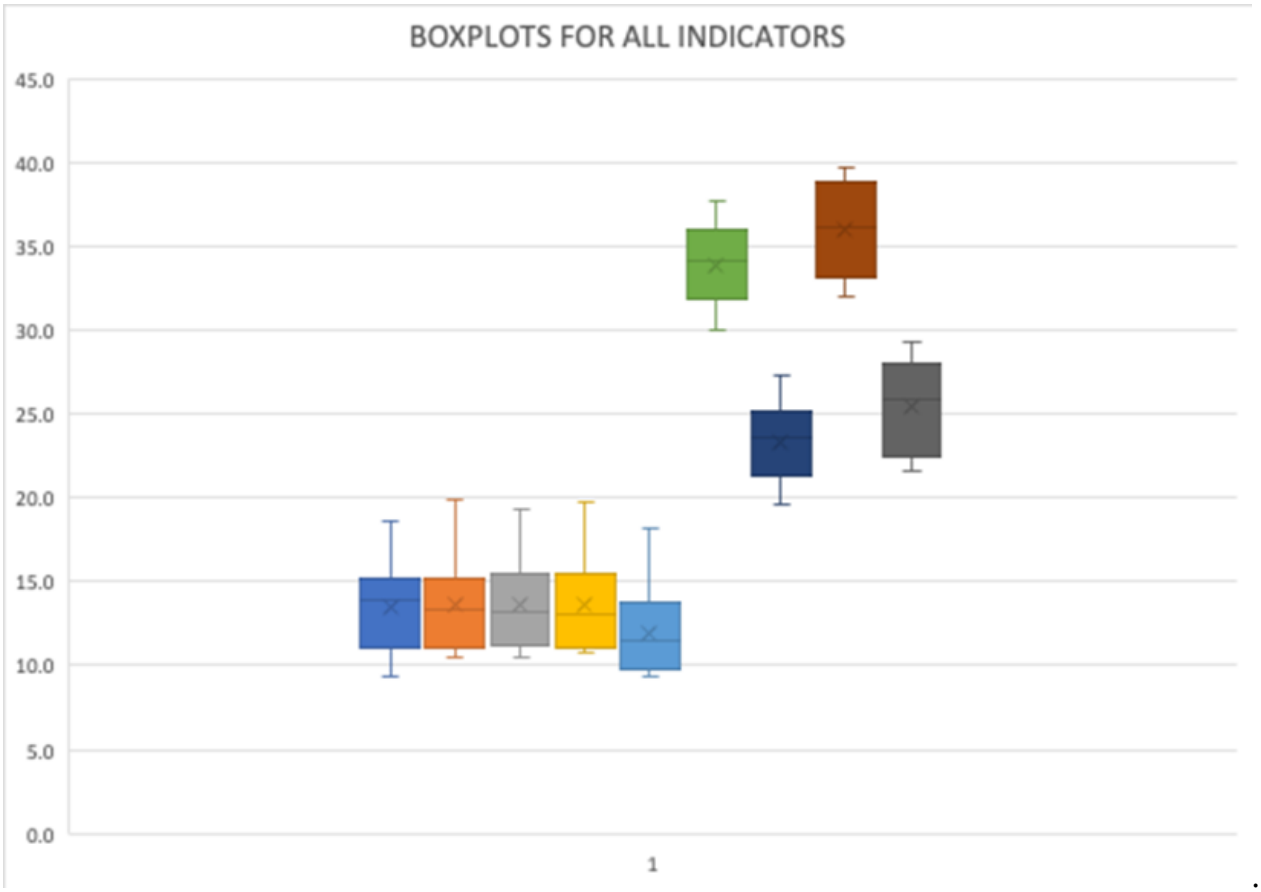

FIGURE 3: SAVINGS (BOX PLOTS FOR ALL INDICATORS)

Hence, using principles from behavioral economics we analyse that the most easily available references do change the risk averse character of population Global Financial Crisis when people invested disproportionately in real assets and housing and suffered enormous losses. That gave a higher subjective weight to losses from investments and even though the growth rate of GDP remained in double figures the growth rates of investment and savings fell down and people looked to diversify their excess of cash holdings. Another factor which affects the proper relationship between savings and investments is the functioning of the Black Economy, because it acts as a lure for people to diversify their holdings

Many people find it worth investing in immediate returns for illegal activities like betting on cricket games rather than long term instruments. This may be even so because much of this black economy activity seems relatively safe as well, which leads to asymmetric base probability of being caught. Moreover, when people feel that others are diversifying in this manner to black investing, they themselves try their luck in these instruments. There is no clear evidence of major consumerist evolution in the Indian economy. This may apply to a small higher income segment as they look to diversify their assets and consumption over a range of references However others in the lower

middle-income segments still have a good response rate to biases and negative references which will change only over time

References:

[1] Lewis, S., & Messy, F. A. (2012). Financial education, savings and investments: An overview.

[2] Mouzelis, N. (1996). The concept of modernization: its relevance for Greece. Journal of Modern Greek Studies, 14(2), 215-227.

[3] Ferguson, Brian S., Lectures on John Maynard Keynes' General Theory of Employment, Interest and Money (5): Chapter 6, The Definition of Income, Saving and Investment; Appendix to Chapter 6, Appendix on User Cost; Chapter 7, The Meaning of Saving and Investment Further Considered (July 27, 2013). University of Guelph Department of Economics and Finance Working Paper No. 2013-10.

[4] Jensen, M. C. (1993). The modern industrial revolution, exit, and the failure of internal control systems. The Journal of Finance, 48(3), 831-880.

[5] Thévenot, L. (1984). Rules and implements: investment in forms. Social science information, 23(1), 1-45.

[6] Sedrakyan, G. S., & Varela-Candamio, L. (2019). Wagner's law vs. Keynes' hypothesis in very different countries (Armenia and Spain). Journal of Policy Modeling, 41(4), 747-762.

[7] Mondal, H., & Mondal, S. (2016). Sample size calculation to data analysis of a correlation study in Microsoft Excel®: A hands-on guide with example. Int J Clin Exp Physiol, 3(4), 180-9.

[8] Khanal AB. Correlation and regression. In: Mahajan's Methods in Biostatistics for Medical Students and Research Workers. 8th ed. New Delhi, India: Jaypee Brothers Medical Publishers (P); 2016. p. 222-31.

[9] Schmuller, J. (2021). Statistical analysis with Excel for dummies. John Wiley & Sons.

[10] Meehl, P. E. (1955). Clinical versus statistical prediction. Journal of Consulting Psychology, 19(2), 155.

[11] Kahneman, D., & Frederick, S. (2002). Representativeness revisited: Attribute substitution in intuitive judgment. Heuristics and biases: The psychology of intuitive judgment, 49(49-81), 74.

[12] https://www.investopedia.com/terms/c/correlation.asp