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DEMOGRAPHIC CHANGES AND ECONOMIC GROWTH IN INDIA

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ABSTRACT

*This study aims to explore the intricate relationship between **economic growth** and **demographic change** in India, emphasizing over two core variables:- Income as the primary determinant and savings as the secondary. Over the past two decades India has witnessed significant demographic transitions marked by rapid urbanization, a growing working age population and evolving consumption and saving patterns. With the help of the secondary data from 1992-2022 obtained from numerous sources like Reserve Bank Of India, World Bank etc. This study analyses how demographic changes influence income generation and savings behavior and how these in turn result in economic growth. This research includes quantitative methods, trends, regression analysis, correlation analysis, to determine the interdependence between income levels and saving rates with respect to demographic factors. This study also notes emerging challenges such as:- rising consumption, income inequality, aging population etc. which may affect future savings and growth stability. Hence, this dissertation concludes that inclusive income growth, improved financial literacy and effective use of household savings are vital for maintaining India's economic growth.*

KEYWORDS:*Economic Growth, Demographic Change, Income, Savings, India, Population, Financial Literacy, Correlation Analysis.*

(1) INTRODUCTION

(1.1) Background of the study

Economic growth and demographic change are two interdependent forces that shape a nation's development. The relationship between them is particularly important in the context of developing countries like India, where population size and structure exert a significant influence on production, consumption, savings and investment.

Demographic changes such as fertility decline, increased life expectancy and a growing working age population can either prosper or constrain economic progress depending on how effectively a country utilizes its human resources. Since the economic liberalization 1991 India has transformed from an agrarian economy to industrial economy driven by industry and services leading to sustained GDP growth rates of average around 6-7% annually.

This period also witnessed demographic transformations: the total population rose from about 870 million in 1991 to over 1.4 billion by 2024, accompanied by a decline of fertility rates and an expansion of the working age group (15-64 years) which now constitutes nearly 65% of the total population. India's income dynamics have undergone substantial shifts.

Rising literacy rates, urbanization, technological advancement and the growth of new sectors such as information technology and e-commerce have increased both individual and household income levels. The savings behavior of the Indian households has also evolved alongside rising incomes.

Traditionally, Indian households preferred physical assets such as Gold and real estate but in recent years there has been a gradual move towards financial savings including mutual funds, insurance and fixed deposits. These savings play a crucial role in domestic capital formation, financial investment and sustaining long term economic growth.

The GDS rate which was around 22% of GDP in 2000, rose to above 30% by 2010 reflecting rising income levels. However, the pattern of savings is closely interlinked to demographic shifts. Younger population tends to prioritize

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consumption and lifestyle expenditures. Middle-aged individuals are more inclined towards saving for education, housing and retirement.

Thus, understanding the interrelatedness between the economic growth, income and savings within the framework of demographic change is crucially important. A higher level of income generally enhances savings which in return fosters economic expansion.

(1.2) Research Challenges

Despite sustained economic growth India faces numerous challenges such as inequality, low per capita income, uneven savings distribution etc. Understanding how demographic shifts are impacted by above mentioned challenges is one of the most vital task as it impacts income levels and saving behavior which is crucial for formulating policies that ensure inclusive and sustainable growth of the economy.

(2) OBJECTIVES OF THE STUDY

- To examine the relationship between economic growth and demographic change in India.
- To analyze income as the primary variable and influencing economic development.
- To study savings as a secondary variable affected by income and demographic change.
- To evaluate how changes in income and savings contribute to India's long term economic performance.

(3) LITERATURE REVIEW

Aiyar, S., & Mody, A. (2011). In their IMF Working Paper titled *"The Demographic Dividend: Evidence from the Indian States,"* conducted a comprehensive empirical analysis to understand how demographic transition influences economic growth across different Indian states. The study employed panel data regression analysis covering several Indian states over multiple decades, focusing on variations in population structure, fertility rates, and economic output. The authors found that states with a larger working-age population share experienced faster per capita income growth than those with higher dependency ratios. This confirms the theoretical proposition that demographic change, when accompanied by supportive economic policies, can accelerate economic growth.

Chandrasekhar, C. P., & Ghosh, J. (2021). In their work on India's macroeconomic and demographic developments, provide a critical evaluation of how demographic change interacts with income distribution and savings behavior in the context of economic growth. Their research emphasizes that while India's demographic transition characterized by a growing working-age population and declining fertility rates has contributed to higher economic growth, the benefits have not been uniformly distributed across social or regional groups. The authors argue that India's economic liberalization since 1991 led to increased GDP growth and rising per capita income, yet this progress has been accompanied by widening income inequality and unequal access to employment opportunities. This imbalance has limited the full potential of the demographic dividend. They further note that much of India's growth has been concentrated in the formal and capital-intensive sectors, leaving a large proportion of the labor force underemployed in the informal economy.

Modigliani, F. (1966). In his seminal paper *"The Life Cycle Hypothesis of Saving, the Demand for Wealth and the Supply of Capital,"* introduced one of the most influential theories linking income, savings, and demographic structure**.** His Life-Cycle Hypothesis (LCH) suggests that individuals plan their consumption and savings behavior over their lifetime to achieve a stable standard of living. According to this theory, people tend to save during their working years and dissave during retirement**,** creating a predictable relationship between age distribution, income levels, and aggregate national savings. Modigliani's framework provided a foundational understanding of how demographic change affects economic growth. In economies where the working-age population is large relative to dependents, aggregate savings rates tend to rise, leading to greater capital accumulation and faster GDP growth. Conversely, as the population ages, savings rates may decline, potentially slowing investment and growth. This theoretical linkage between population structure**,** income generation, and savings accumulation remains central to modern economic and demographic research.

Patnaik, I., & Narayanan, A. (2019). In their study on India's household financial behavior and macroeconomic development, explore the evolving relationship between income growth, savings patterns, and demographic transition in the post-liberalization era. Their research focuses on understanding how rising incomes, shifting population

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structures, and changing consumption preferences collectively influence the rate and composition of household savings in India.

The authors observe that the period following economic liberalization in 1991 marked a significant transformation in India's economic structure. Rapid income growth, urbanization, and labor market expansion contributed to higher disposable incomes, especially among the middle class. However, Patnaik and Narayanan highlight that the increase in income has not translated proportionally into higher savings for all segments of society. While the upper-income groups witnessed substantial savings accumulation, lower- and middle-income households often experienced stagnating or fluctuating savings rates due to rising living costs and limited access to formal financial systems.

(4) RESEARCH QUESTION

- How do variations in income levels across different population groups affect national savings behavior?
- What is the relationship between income growth (primary variable) and demographic change in India?
- How can changes in income and saving patterns contribute to sustainable and inclusive economic growth in the context of India's demographic transition?

(5) RESEARCH METHODOLOGY

This study uses descriptive analysis, as wells as statistical tools of regression and correlation to examine the relationship between per capita income and gross domestic savings in India by taking into account data from 1991 to 2024.

It examines the Per capita income being the independent variable and Gross domestic savings being the independent variable.

Correlation

Correlation is a statistical measure that shows the degree of relationship between two or more variables.
It indicates how strongly and in what direction (positive or negative) the variables are related to each other.
Example:
If an increase in income leads to an increase in expenditure, there is a positive correlation between income and expenditure.

Regression

Regression is a statistical technique used to estimate or predict the value of one variable (called the dependent variable) based on the value of another variable (called the independent variable).
It also helps in understanding the cause-and-effect relationship between the variables.
Example:
Predicting a person's weight (dependent variable) from their height (independent variable) using a regression equation.

(6) HYPOTHESIS

Null Hypothesis (H_0): There is no significant relationship between income levels and savings rates in India.
Alternative Hypothesis (H_1): There is a significant positive relationship between income levels and savings rates in India.

(7) FINDINGS AND REASONINGS

Initially, the research timeline is determined from 1992- 2022. After determining the timeline for observation, data is collected for both, the independent and dependent variables, i.e., Per capita income as well as the Gross domestic savings respectively.

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Financial Year (FY)	Per Capita Net National Income (NNI) (Current Prices in ₹) (X)
1992-93	7,654
1993-94	8,432
1994-95	9,848
1995-96	11,373
1996-97	12,324
1997-98	13,003
1998-99	14,357
1999-00	16,160
2000-01	17,215
2001-02	18,171
2002-03	19,045
2003-04	22,233
2004-05	25,487
2005-06	29,886
2006-07	35,666
2007-08	41,533
2008-09	44,484
2009-10	51,707
2010-11	60,637
2011-12	67,522
2012-13	74,489
2013-14	82,269
2014-15	86,450
2015-16	93,668
2016-17	1,03,870
2017-18	1,12,835
2018-19	1,24,105
2019-20	1,34,226
2020-21	1,28,829
2021-22	1,50,007

Table 1.1 Per Capita Net National Income

Source: World Bank Group

This data presented above in the table 1.1 is highly important as it tracks the economic growth and prosperity of a country over a significant period. The data provided represents the Per Capita Net National Income (NNI) at Current Prices (X) for various Financial Years (FY) .

The table presents the Per Capita Net National Income (NNI) at Current Prices (in ₹) for 30 consecutive Financial Years, from 1992-93 to 2021-22. The data clearly illustrates significant economic progress and rising average income over three decades, with a sharp, but temporary, setback during the pandemic year of 2020-21.Further, Figure 1.2 shows the graphical representation of the same.

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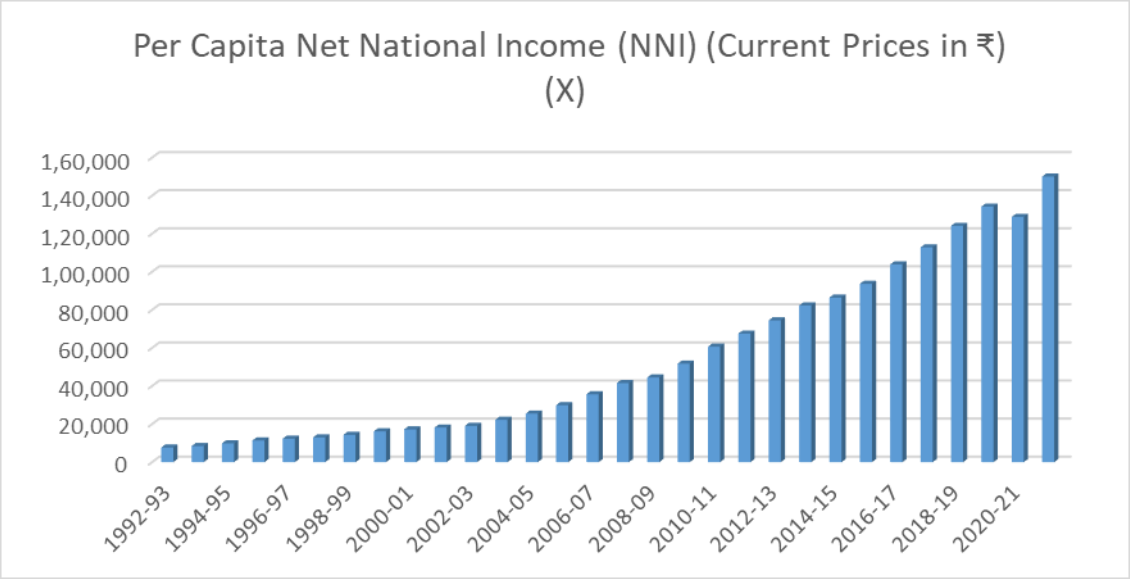


Figure 1.2 Per Capita Net National Income

Source: World Bank Group

Further, the data is compiled to measure economic growth and stability, standard of living, analyzing investment growth as savings serve as a really crucial part of the development and growth of an economy. The table tracks the Gross Domestic Savings (GDS) as a percentage of GDP at Current Prices for 30 Financial Years, from 1992-93 to 2021-22. The gross domestic savings with respect to financial years are presented in the table 1.3. Figure 1.4 provides the graphical representation for the same.

Financial Year (FY)	Gross Domestic Savings (GDS) (% of GDP at Current Prices) (Y)
1992-93	24.3
1993-94	24.5
1994-95	26.1
1995-96	27.2
1996-97	25.9
1997-98	25.1
1998-99	23.3
1999-00	25.6
2000-01	26.6
2001-02	28.5
2002-03	29.0
2003-04	31.9
2004-05	33.5
2005-06	34.3
2006-07	37.0
2007-08	37.7
2008-09	32.1
2009-10	33.7
2010-11	34.8
2011-12	34.1
2012-13	32.9
2013-14	33.0
2014-15	31.5

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2015-16	31.1
2016-17	30.5
2017-18	30.1
2018-19	30.2
2019-20	30.8
2020-21	30.2
2021-22	30.8

Table 1.2 Gross Domestic Savings

Source: World Bank Group

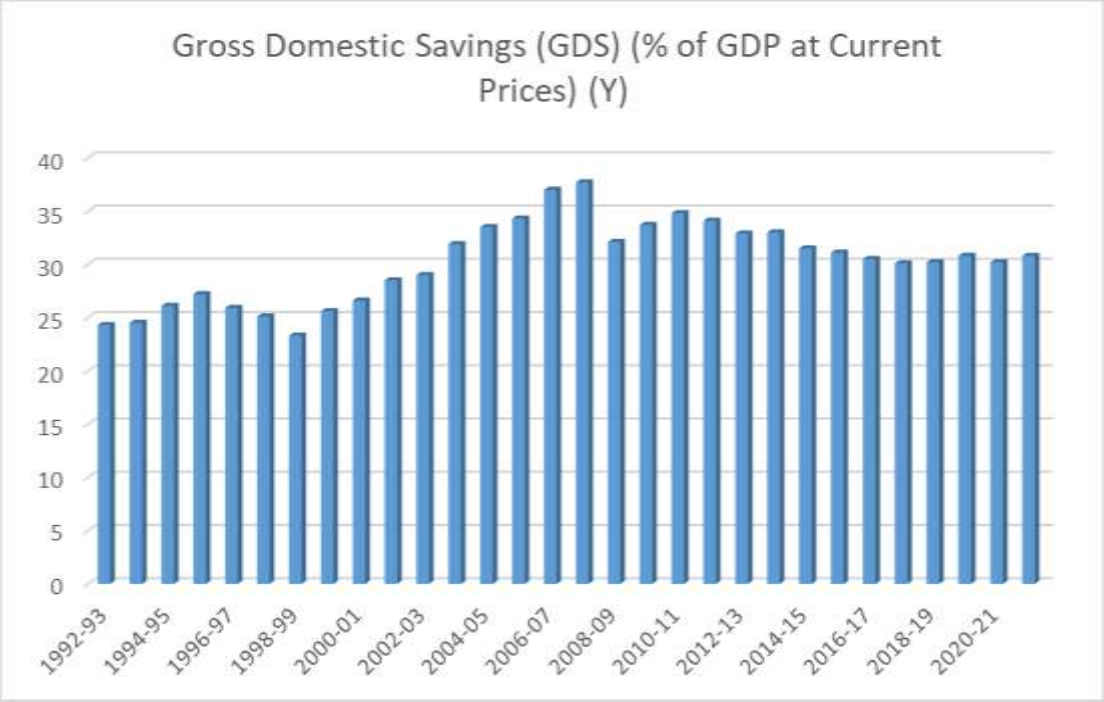


Figure 1.3 Gross Domestic Savings

Source: World Bank Group

Further, Figure 1.4 provides us with a comparative analysis of both the primary variable that is Per Capita Income and the secondary variable that is Gross Domestic Savings. The graphical representation clearly states that as income per person rises, gross domestic savings also tend to remain at a healthy level, indicating a generally strong relationship between income growth and saving capacity. **However**, the **rate of increase in NNI** far exceeds the change in **GDS percentage**, implying that people are earning more but **spending a higher proportion** of their income over time. Income and Savings they both serve as a really vital role for the improvement and growth of the economy

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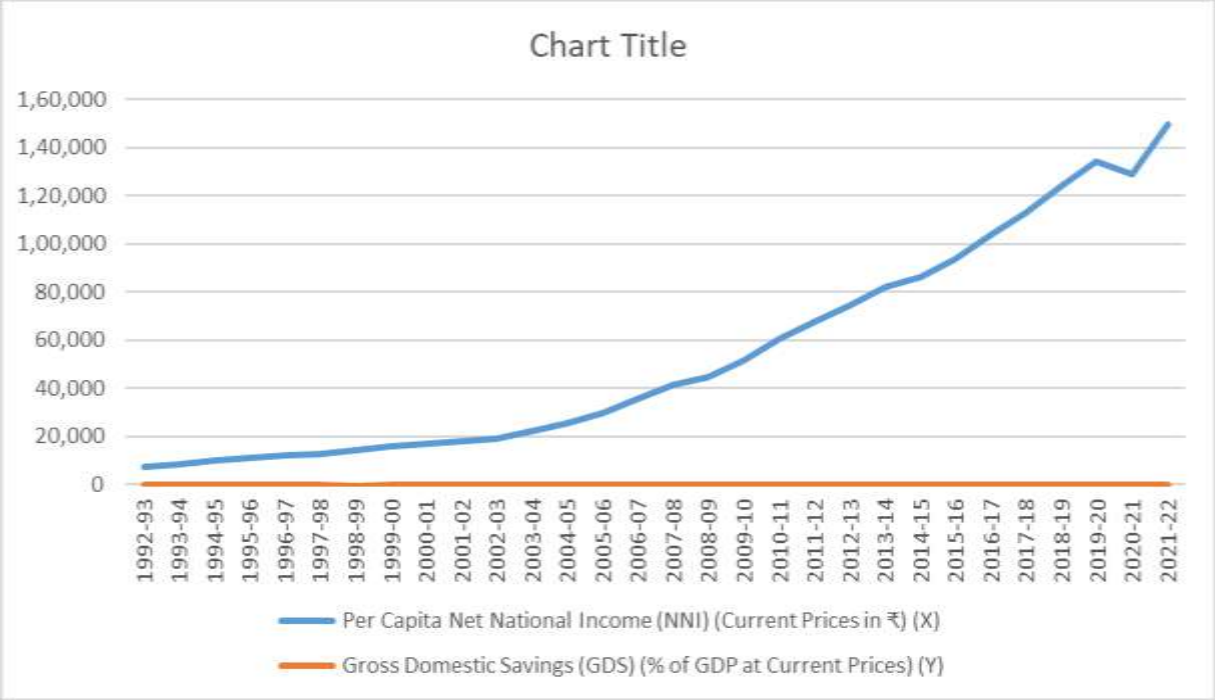


Figure 1.4 Per Capita Net National Incomes and Gross Domestic Savings

Source: World Bank Group

	Per Capita Net National Income (NNI) (Current Prices in ₹) (X)	Gross Domestic Savings (GDS) (% of GDP at Current Prices) (Y)
Per Capita Net National Income (NNI) (Current Prices in ₹) (X)	1	
Gross Domestic Savings (GDS) (% of GDP at Current Prices) (Y)	0.369797036	1

Figure 1.5 Correlation

In this correlation analyses, the diagonal values are 1, indicating that each variable has a perfect correlation with itself. The correlation between Per capita income and Gross domestic savings is 0.369 which means there exists weak to moderate positive correlation. Since there exists a positive relationship both the variables tend to move towards the same direction i.e, when per capita income goes up the gross domestic savings also tend to increase and vice-versa.This aligns with the basic economic idea that as people get richer, they save a larger portion of income enabling more investment.

In this study, this relation between the two variables is further examined and validated by applying the statistical tool of regression, accounting for data from 1992-2022. The results of the regression analysis are displayed in Table 1.6

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SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.369797
R Square	0.13675
Adjusted R Square	0.105919
Standard Error	3.630114
Observations	30

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	58.45058	58.45058	4.435558	0.04429
Residual	28	368.9764	13.17773		
Total	29	427.427			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	28.49024	1.051688	27.09002	1.25E-21	26.33595	30.64452	26.33595	30.64452
Per Capita Income	3.19E-05	1.51E-05	2.106076	0.04429	8.73E-07	6.29E-05	8.73E-07	6.29E-05

Figure 1.6 Regression Analysis

From the given regression analysis, the following can be inferred:

MULTIPLE R

Value: 0.369797

This is the correlation coefficient, measuring the strength of the linear relationship. A value of 0.37 indicates a weak-to-moderate positive linear relationship between Per Capita Income and the dependent variable. A value closer to 1 would indicate a stronger relationship.

R SQUARE (R^2)

Value: 0.13675

This is the coefficient of determination .It suggests that approximately 13.68% of the variation in the dependent variable is explained by changes in Per Capita Income, implying that while income influences the outcome, other factors also play a significant role.

STANDARD ERROR

Value: 3.630114

This is the standard deviation of the error term, or the average distance that the observed values fall from the regression line. It is a measure of the model's accuracy, with smaller values indicating a better fit. It indicates that the predicted values deviate from the actual observations by an average of about 3.63 units, showing a moderate level of prediction accuracy.

F-STATISTIC

Value: 4.435558

This is the ratio of the mean square of the regression to the mean square of the residual. It tests the null hypothesis that all regression coefficients are zero. The value of 4.435 is relatively small. The F-statistic of 4.44 measures the overall significance of the regression model. It tests whether the model provides a better fit to the data than a model

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with no independent variables. A higher F-statistic indicates that the explanatory variable contributes meaningfully to predicting the dependent variable. In this case, an F-value of 4.44 suggests that the model has a reasonable explanatory power and that Per Capita Income does improve the prediction of the dependent variable to some extent.

P-VALUE

Value: 0.04429

Since 0.04 is less than the common significance level of 0.05, this would reject the null hypothesis. This means that the relationship between "Per Capita Income" and the dependent variable is statistically significant. There is sufficient evidence to conclude that Per Capita Income has a real effect and is not just a result of random chance.

(8) CONCLUSION

The relationship between economic growth and demographic change in India is complex, dynamic and largely positive. Since liberalization in 1991, India has undergone profound structural transformations that have significantly influenced income generation, consumption patterns and saving behavior.

The analysis of income and saving trends from 1992 to 2022 demonstrates that economic growth and demographic transitions are mutually enforcing. As the working age population expanded creating demographic dividend India has experienced higher household and corporate savings. This period of demographic advantage enhanced labor supply, productivity and aggregate income further contributing to economic expansion.

Correlation and regression results highlight a positive relationship between income and savings. In conclusion, India's experience demonstrates that economic growth and demographic dynamics are interlinked. Income growth fosters higher savings and investments while favorable demographics amplify this processe through a growing and productive labor force.

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