Demographic Transition and Household Finance: Optimal Consumption Growth and Asset Accumulation Under Household Fission in India

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Abstract: *The Indian family has changed significantly from joint to nuclear structures due to demographic shifts, urban growth, increased education, job mobility, and changing socioeconomic norms. This shift has affected household spending, saving habits, and long-term asset building. This study develops a utility-maximisation framework to examine how households transitioning from joint to unequal nuclear families affect welfare, spending growth, and savings outcomes. Utility is measured on a per-capita basis to enable an equitable welfare comparison in households of different sizes, whereas income is randomly growing. The model specifies a utility with constant relative risk aversion (CRRA), leading to an equation which determines optimal growth in spending. The numerical simulations are implemented on a horizon of ten periods and various income conditions: higher family size with lower income, higher family size with higher income, and equal income among the family. The results show that smoothing consumption is valid in any situation, consistent winter-temporaloral optimisation, despite strong income variations. The findings indicate that individuals keep their spending consistent across all scenarios, as their expenditure habits align with their long-term financial plans, which remain steady despite fluctuations in income. According to this research, family size structure determines how families perform economically. Smaller family units generally experience improved individual spending, more efficient savings, and quicker accumulation of assets than larger families, regardless of income level. The consumption habits of both families diminish slowly over time, leading individuals to feel a reduction in their welfare as they set aside funds for emergencies. Families maintain their total utility after separation; however, their different family sizes cause them to follow different saving and asset development trajectories. Research shows that nuclear family structures help households achieve their financial goals, but these changes create problems for long-term financial stability and capital generation because of demographic restrictions, which make it necessary to include family structure when creating savings and welfare dynamic models.*

Keywords: Household fission, Nuclearization of families, Inter-temporal utility maximisation, Consumption smoothing, Household savings, Asset Accumulation.

1. INTRODUCTION

The family structure in India has changed drastically over the years, with tradition intermingling with modernity, partly being shaped by social and economic developments and cultural transformation; in essence, it is a reflection of the larger societal changes in India being widened by urbanisation, globalisation, higher levels of education, and increasing influence on gender roles, leading to emphasis placed on labour migrants, and astounding fast technological developments. (Caldwell, 1982; Chakravorty et al., 2021).

Among the prevalent family systems in India, the joint family system has historically been one of the most respected. Multiple members of the joint family shared their income and expenses, which made them more than just a social unit. Living together as one unit makes the bond of trust extremely strong between multiple generations (Caldwell, 1982; Singh, 2003). This way of life soon began to be disrupted by small nuclear families. With the passage of time and changes in the work paradigm, members of a joint family started to leave their homes and move towards nuclear units. An increase in the cost of living in urban areas, a dearth of affordable housing, and industrial growth contributed to this migration. Significant momentum was gained through this change with the liberalisation of the Indian economy and strong growth in consumer culture. (Chakravorty et al. 2021; Singh 2003).

The joint family system still exists today, but the economic and social importance that it traditionally had has been on the decline, especially in urban settings. It is expected that this decline will become even more noticeable with time. (Chakravorty et al., 2021). One of the key factors in this change has been the importance of financial independence among all family members. There has been an increase in the work every member of the household has to put in to meet their financial needs, either by providing support to the household or by becoming financially stable on their own. Major factors that have contributed to this shift towards nuclear households and increased independence have been a change in goals among the younger populace, increased access to higher education and financial knowledge, and most significantly, an increase in women in the workforce. (Chakravorty et al. 2021; Sukach 2016).

The basic economic principles behind the joint family system have been broken down. We have seen a

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revision of the material infrastructure and legal institutions. The economic basis of the joint family has been weakened by various reforms in legal and institutional systems. The strengthening of property rights for an individual and updates in wage, inheritance, and labour laws are some of the changes that have contributed to this breakdown. (Singh 2003). An increase in focus on household economic decision-making, especially with regard to spending and savings, has also been noticed.

The per capita consumption pattern changes when members of a joint family move to a simpler one-family structure. Fixed potential expenses are duplicated by this shift and cause a disruption of the already limited informal insurance that was received by nuclear families from their extended members. (Singh, 2003). The increased appeal of the nuclear family structure has been due to the blending of cultural limits and social structures, which has enabled multiple income sources. An increase in poverty or deprivation for many individuals could be the cause of this trend. (Sukach, 2016; Oldroyd et al., 2022). For this reason, an economic model is being established by this study, which would examine the effects of separation on the emotional aspect, spending habits, and saving patterns among family members over a period of time.

2. LITERATURE REVIEW

Recent demographic and sociological studies have revealed a shift from the traditional joint family to modern nuclear families. There is an ongoing discussion regarding the long-term economic effects of this shift. Noticeable early evidence from rural South India, from a micro-demographic study, has shown that an increase in education, the rise of monetisation, an increase in the non-agricultural job market, a decline in fertility, and a lack of stable joint families have been the leading factors for households to break up into smaller nuclear units. (Caldwell 1982)

Recent demographic changes show that the number of people living in each household has been dwindling, particularly in the urban and semi-urban sections of India, and this has made nuclear families the predominant mode of household organisation (Chakravorty et al., 2021). These accounts illustrate the elimination of shared income and consumption patterns caused by individual choices in nuclear families. A nuclear family can be construed as a single economic unit for sharing resources, consumption, kinship, and authority. Keeping this context in mind, it is clear that consuming together and sharing risks across multiple generations definitely have their own benefits. (Sukach, 2016; Singh, 2003).

There was an alteration in authority and economic responsibilities with the breakup of Indian households. Risks that traditionally belong to larger joint families must now be handled by smaller nuclear families. (Singh, 2003). Fundamental shifts in economic structures caused by joint families moving to nuclear families are emphasised by this change. Research on household finances has shown that the idea of unitary households is accurate. Savings and consumption behaviour are significantly affected by control over income and spending. Evidence accumulated from members of Indian joint families indicates that asset accumulation can be achieved by centralised money management, coupled with disciplined savings, although it comes at the cost of shared priorities. (Singh, 2012).

On the contrary, studies on nuclear or mixed-parent families have revealed evidence of decentralised financial decision making, an increase in income uncertainty, and greater reliance on self-management savings and meticulous financial practices. (Raijas, 2011a, 2011b). A change in saving habits based on household conditions may be noticed rather than fixed, as these factors suggest. The importance of inter-temporal utility theory is highlighted by the social and cultural views on savings. As suggested by research, saving is not just a byproduct of consumption in the South Asian region; its vital role in family security, children's education, housing, and future welfare cannot be ignored. (Jain, 1997).

On the other hand, household structure does impact the ability to meet these motivating needs, as suggested by incentive theory. In a joint family setting, savings are pooled, and informal insurance is operationalised, while in nuclear family settings, there is duplication in the case of fixed costs, and smaller families are more vulnerable to any kind of income shock (Singh, 2003; Jain, 1997). This difference is very similar to the definition of per-capita utility used in the current paper. This link may be examined using various proxies and through different macroeconomic and cross-country studies. There is ample evidence across various countries which further argues that household structure and demographic transitions have considerable influence on household saving rates, independent of income effects (Curtis et al. 2017).

Likewise, social norms research shows that in case the intergenerational support systems become weak, families tend to invest more of their wealth in precautionary savings to protect themselves against the risk of an uncertain future (Chen et al. 2019). Intuitionally, these insights underlie the model assumption of stochastic growth of income and maintenance of consumption smoothing, to the extent that savings and asset accumulation become differentiated between nuclear families of differing sizes. These results are further contextualised in the literature that addresses investment and risk-related research, since household preferetowardsward safe and liquid assets is high in environments where income uncertainty is high and social security is low (Morris, 1984; Karlan and Morduch, 2014).

Since joint-family based insurance is fading away with nuclearization, a household reacts by staying risk exposure. This behavioural reaction is in line with the findings of the simulation of the current study, where smooth consumption growth is observed across the family types but systematically higher per-capita consumption and savings rates are seen in the smaller family types. This is supported by evidence regarding asset accumulation and housing which highlights the enduring effects of smaller family sizes on financial outcomes related to wealth (Cohen et al., 2022).

3. RESEARCH GAP

Although there is extensive literature on family transitions and household financial behaviours related to savings and investments, current research lacks in-depth and nuanced investigations. The usual argument posits the

family as a stable demographic landmark and shows cross-sectional models (Chakravorty et al., 2013; Singh, 1971; Jain, 1997).

In fact, limited analytical research has constructed definitive theoretical frameworks for the transition of nuclear families from a collective to a more loosely structured state, marking a pivotal shift in household economic choices.

Specifically, no work has looked at the part that family size dynamics have to play in per-capita consumption, merging a part of the income as a possible utility maximiser with persistent arguments that it is kept under the law of subsumed utility for utility maximisation given the division of the household, without previously focusing on the impact on the growth of consumption and saving associated with a stochastic income stream (Curtis et al., 2017). The results show that there is still much to study regarding long-term savings and capital formation in nuclear households.

4. RESEARCH OBJECTIVES

Based on the previous discussion, this study focuses on the following areas.

- To examine how transitioning to a nuclear family, a joint families declare affects utility maximisation. Welfare was measured by per capita consumption.
- To explore how family size affects the growth pathways for consumption rafter changes from joint to nuclear family setups.
- To understand how nuclearization influences saving behavior and long-term asset growth when income increases with uncertainty.
- Consideration of how to maintain overall utility maximisation.

Changes in savings and investment behaviour in India might be affected by the way joint families have shifted alongside new consumption patterns (Kapoor, 2014). In addition, the social, demographic, and economic foundations of households have been transformed. Increased education, especially among women, along with their entry into paid work, has led to more nuclear families with double or multiple incomes, which has improved living standards (Sukach, 2016).

5. THEORETICAL MODEL

5.1 Model Framework

Suppose there exists a joint household that bifurcates into two nuclear families n_1 and n_2 , where $n_1 \neq n_2$. Let n_i represent nuclear family i.

After this split, all income and assets are separated. Each nuclear family has its own budget constraints and income processes. The well-being of the entire family was measured by adding the benefits of all sub-families. Income varies randomly but often increases over time. Changes from the expected constant value are very important. It is also assumed that income changes over time because of random processes instead of remaining constant. Income processes include fixed growth factors and random shocks.

Income growth is denoted as follows:

$$Y_{t+1} = (1+g_y)y_t \exp(t_{t+1})$$

where g_y denotes income growth, and a stochastic shock is considered. Income levels differed across nuclear families after the split.

The joint family is modelled as splitting into two nuclear families, n_1 and n_2, where family sizes are unequal and income is divided accordingly. Aggregate family utility is defined as the summation of the family utilities of each nuclear family, with each family utility varying directly with per-capita consumption. This summation structure allows an analysis of the welfare of all families from this general perspective.

Because utility is defined in per capita terms, changes in family size directly affect utility outcomes (Curtis et al., 2017). Even when total income is redistributed across nuclear families, differences in income levels influence per-capita consumption and, therefore, aggregate utility.

Savings, the gap between income and consumption, form assets in the current period. The assets waiting for the next period are classified as those from the past period, transferred to the present period after increasing interest income with current savings (Karlan & Morduch, 2014).

5.2 Utility Specification

Households derive welfare from per-capita consumption, and maximising a per-capita utility function ensures that welfare comparisons remain valid across different family sizes, which is crucial when analysing the split of a joint family into unequal nuclear units (Curtis et al., 2017).

Aggregate utility is obtained by summing per-capita utilities weighted by family size, allowing an assessment of whether aggregate utility maximisation is preserved after household fission.

Aggregate Utility function:

$$\sum_{t=0}^{\infty} \beta^t \, n_i \, u(c_i/n_i)$$

where:

- β: time discount factor
- c_{it}: total consumption of nuclear families i at time period t
- c_i/n_i: per-capita consumption
- u is utility function

The household's objective is to maximise discounted lifetime utility sinter-temporal intertemporal asset constraint:

$$\text{Max} \sum_{t=0}^{\infty} \beta^t \, n_i \, u(c_i/n_i)$$

Subject to: $a_{t+1}^{\,i} = (1+r)a_t^{\,i} + y_i - c_t^{\,i}$

where:

- $a_t^{\,i}$: asset or savings of current period t
- r: interest rate

y_i: income of current period

By maximising discounted lifetime utility subject to an asset accumulation constraint, the model inter-temporal intertemporal trade-off between current and future consumption financed through savings and asset returns. The discount factor reflects a household's valuation of future utility relative to present utility, explaining why households may reduce their current consumption to enhance future welfare.

5.3 Optimization Problem

To solve this, we used the following Lagrangian equation:

$$L = \sum_{t=0}^{\infty} \beta^t n_i u(c_i / n_i) + \sum_{t=0}^{\infty} \lambda_t[(1+r)a_t^i + y_t - c_t^i - a_{t+1}^i]$$

The optimisation problem is solved using the Lagrangian method. Two first-order conditions were obtained. These conditions jointly determine the optimal consumption and savings paths.

First-Order Conditions of the Lagrangian Equation:

(i) $\partial L/\partial c_t^i = \beta^t n_i u'(c_t/n_i)(1/n_i) - \lambda_t = 0$ ... (1)
(ii) $\partial L/\partial a_{t+1}^i = -\lambda_t+(1+r)\lambda_{t+1} = 0$ ... (2)
From (1), $\lambda_t = \beta^t u'(c_t/n_i)$ ... (3)
From (2), $\lambda_t = (1+r)\lambda_{t+1}$ ... (4)
From (3) and (4),
$\beta^t u'(c_t/n_i) = (1+r)\lambda_{t+1} = (1+r)\ \beta^{t+1} u'(c_{t+1}/n_i)$
Or, $u'(c_t/n_i) = (1+r)\ \beta\ u'(c_{t+1}/n_i)$ ... (5)

5.4 CRRA Utility Function

Let us consider the utility function constant relative risk aversion (CRRA) utility specification.

The resulting consumption growth rate is determined by the discount factor and interest rate, scaled by the coefficient of relative risk aversion. This growth parameter, denoted as g, captures the optimised rate at which consumption evolves for a family under utility maximisation.

Considering the constant relative risk aversion CRRA Utility function:

$u(c) = c^{1-\delta}/(1-\delta), \delta>0$

with marginal utility:

$u'(c) = c^{-\delta}$ ... (6)

Substituting the value of (6) in (5) into the equation gives:

$(c^{-\delta}_t) = \beta(1+r)(c^{-\delta}_{t+1})$

$1/(c^{\delta}_t) = \beta(1+r).\ [1/(c^{\delta}_{t+1})]$

$(c^{\delta}_{t+1})/(c^{\delta}_t) = \beta(1+r)$

Rearranging by taking the δth root:

$c_{t+1}/c_t = [\beta(1+r)]^{1/\delta}$

Consumption Growth Rate

$$g \equiv c_{t+1}/c_t = [\beta(1+r)]^{1/\delta}$$

The discount factor represents the trade-off between current and future utility. A lower discount factor implies that future utility is valued less than current utility, whereas a higher discount factor implies a stronger preference for future utility.

5.5 Savings Determination

Considering the optimised consumption growth path, savings will be the endogenous variable to represent the remnant of increasing income and consumption. The interdependence of increases in income and consumption defines the course of saving and accumulating assets (Karlan and Morduch, 2014).

` The difference in assets between periods is specified as savings. Future asset holdings depend on existing savings and previous asset values. Hence, the model offers a way of measuring how future savings would increase or decrease after the divorce of a joint family. The savings behaviour is obtained by the optimisation utility structure, whereby the savings behaviour inter-temporalintertemporal utility maximisation.

We can define savings as

$S_t = a_{t+1} - a_t$

This signifies that within period t+1, the value of assets is equal to the value of assets carried over from period t added to the savings from the current period. Over time, internal factor savings increase with income and spending. The unpredictable nature of growth in income and the choices made while spending affects the level of savings and asset growth. In the general sense, changes in savings caused by a split in a joint family depend on the formulas for growth in consumption and income.

Once these joint families split into separate nuclear units, these simulation results can help us determine whether the overall utility maximisation continues. Based on different income growth scenarios, these results can also help us explore how future savings behaviour might change. We have presented a framework that allows us to examine how the overall utility maximisation occurs once a joint family splits into smaller nuclear families, and how this change in the size of a household, growth in income, and spending patterns impact the long-term savings and accumulation of assets. (Curtis et al., 2017; Chen et al., 2019).

Researchers intertemporal consumption and habits of saving in a joint family that is undergoing separation, which leads to the creation of two new unequal nuclear families with different sizes and income levels. It examines a model that evaluates the benchmark of aggregate utility maximisation realised after the division, where utility depends on per-capita consumption, and decisions are made under a fluctuating asset constraint.

6. DATA ANALYSIS

The data analysis is based on numerical simulations for 10 years derived from the intertemporal utility maximisation framework outlined in the model. The simulations operationalise the equation-based consumption growth rule under stochastic income growth:

$$g \equiv c_{t+1}/c_t = [\beta(1+r)]^{1/\delta}$$

The parameter values are assumed to be ß = 0.96, which is the discounting factor. To obtain 1 unit of utility in the future, we assume 0.96 units of utility at present. r = 0.04, that is, the rate of interest, as the normal rate of interest on a savings bank account is 4% to 5% in general. Income growth is 3%, as is normal in India; the income growth is by this percentage, and the sigma of income is 0.15, while consumption follows the optimised smoothing path. For each period, income, consumption, per capita consumption, savings, and asset accumulation are computed. The average optimal savings rates are calculated as the time-averaged savings-to-income ratios for each family.

7. RESULTS

7.1 Scenario A: Higher Family Size with Lower Income

In the first simulation, the larger family begins with an initial income of 80 and a family size of four, whereas the smaller family starts with an income of 100 and a family size of three. Despite stochastic income fluctuations, the consumption paths for both families remain smooth over time, reflecting the consumption-smoothing property.

Table 1: Simulation Results – Scenario A: Higher Family Size with Lower Income

S.No	Time	Family Type	Income	Family Size	Consumption	Per Capita Consumption	Assets	Savings
1	1	LARGE FAMILY	80	4	48	12	0	32
2	2	LARGE FAMILY	75.76	4	47.96	11.99	32	27.79
3	3	LARGE FAMILY	75.38	4	47.92	11.98	61.07	27.46
4	4	LARGE FAMILY	98.09	4	47.88	11.97	90.97	50.21
5	5	LARGE FAMILY	102.11	4	47.85	11.96	144.82	54.26
6	6	LARGE FAMILY	107.23	4	47.81	11.95	204.88	59.42
7	7	LARGE FAMILY	142.85	4	47.77	11.94	272.5	95.08
8	8	LARGE FAMILY	157.67	4	47.73	11.93	378.48	109.94
9	9	LARGE FAMILY	134.33	4	47.69	11.92	503.56	86.64
10	10	LARGE FAMILY	124.82	4	47.66	11.91	610.34	77.16
11	1	SMALLER FAMILY	100	3	60	20	0	40
12	2	SMALLER FAMILY	96.34	3	59.95	19.98	40	36.39
13	3	SMALLER FAMILY	119.23	3	59.9	19.97	77.99	59.33
14	4	SMALLER FAMILY	129.62	3	59.86	19.95	140.43	69.76
15	5	SMALLER FAMILY	141.78	3	59.81	19.94	215.81	81.97
16	6	SMALLER FAMILY	148.48	3	59.76	19.92	306.41	88.71
17	7	SMALLER FAMILY	140.7	3	59.71	19.9	407.38	80.98
18	8	SMALLER FAMILY	189.46	3	59.66	19.89	504.66	129.8
19	9	SMALLER FAMILY	210.28	3	59.62	19.87	654.65	150.66
20	10	SMALLER FAMILY	161.26	3	59.57	19.86	831.49	101.69

Computed Average Optimal Savings Rates: Larger Family = 0.535 Smaller Family = 0.560

Thus, over a period of 10 years of simulation horizon, it is observed that

- Per capita consumption expenditure is reducing for both large and small families.
- There is an increasing trend in comelsll.
- There is an increasing trend in asset creation.
- Both types of families increase their savings for a better future.
- However, it is clear that the growth in the savings rate in smaller families is higher than that in larger families.

7.2 Scenario B: Higher Family Size with Higher Income

In the second scenario, the larger family has a higher initial income of 100 with a family size of 4, whereas the smaller family has an initial income of 80 with a family size of 3. Consumption continues to follow the optimised growth path.

Table 2: Simulation Results – Scenario B: Higher Family Size with Higher Income

S.No	Time	Family Type	Income	Family Size	Consumption	Per Capita Consumption	Assets	Savings
1	1	LARGE FAMILY	100	4	60	15	0	40
2	2	LARGE FAMILY	94.69	4	59.95	14.99	40	34.74
3	3	LARGE FAMILY	94.23	4	59.9	14.98	76.34	34.32
4	4	LARGE FAMILY	122.62	4	59.86	14.96	113.72	62.76
5	5	LARGE FAMILY	127.64	4	59.81	14.95	181.03	67.83
6	6	LARGE FAMILY	134.04	4	59.76	14.94	256.1	74.28
7	7	LARGE FAMILY	178.57	4	59.71	14.93	340.62	118.85
8	8	LARGE FAMILY	197.09	4	59.66	14.92	473.1	137.42
9	9	LARGE FAMILY	167.91	4	59.62	14.9	629.45	108.3
10	10	LARGE FAMILY	156.02	4	59.57	14.89	762.92	96.45
11	1	SMALLER FAMILY	80	3	48	16	0	32
12	2	SMALLER FAMILY	77.07	3	47.96	15.99	32	29.11
13	3	SMALLER FAMILY	95.38	3	47.92	15.97	62.39	47.46
14	4	SMALLER FAMILY	103.69	3	47.88	15.96	112.35	55.81
15	5	SMALLER FAMILY	113.42	3	47.85	15.95	172.65	65.58
16	6	SMALLER FAMILY	118.78	3	47.81	15.94	245.13	70.97
17	7	SMALLER FAMILY	112.56	3	47.77	15.92	325.91	64.79
18	8	SMALLER FAMILY	151.57	3	47.73	15.91	403.73	103.84
19	9	SMALLER FAMILY	168.22	3	47.69	15.9	523.72	120.53
20	10	SMALLER FAMILY	129.01	3	47.66	15.89	665.2	81.35

Computed Average Optimal Savings Rates: Larger Family = 0.535 Smaller Family = 0.560

Thus, over a period of 10 years of simulation horizon, it is observed that

- Per capita consumption expenditure is reducing for both large and small families.
- There is an increasing trend in incoml.
- There is an increasing trend in asset creation.
- S,o both types of families are trying to increase savings for a better future.
- However, it is clear that the growth in the savings rate in smaller families is higher than that in larger families.

7.3 Scenario C: Equal Income Across Families

In the third simulation, both families began with identical initial incomes of 100, while household sizes remained unequal. Total consumption paths evolve smoothly and similarly across families, but per capita consumption differs due to differences in family size.

Table 3: Simulation Results – Scenario C: Equal Income Across Families

S.No	Time	Family Type	Income	Family Size	Consumption	Per Capita Consumption	Assets	Savings
1	1	LARGE FAMILY	100	4	60	15	0	40
2	2	LARGE FAMILY	94.69	4	59.95	14.99	40	34.74
3	3	LARGE FAMILY	94.23	4	59.9	14.98	76.34	34.32
4	4	LARGE FAMILY	122.62	4	59.86	14.96	113.72	62.76
5	5	LARGE FAMILY	127.64	4	59.81	14.95	181.03	67.83
6	6	LARGE FAMILY	134.04	4	59.76	14.94	256.1	74.28
7	7	LARGE FAMILY	178.57	4	59.71	14.93	340.62	118.85
8	8	LARGE FAMILY	197.09	4	59.66	14.92	473.1	137.42
9	9	LARGE FAMILY	167.91	4	59.62	14.9	629.45	108.3
10	10	LARGE FAMILY	156.02	4	59.57	14.89	762.92	96.45
11	1	SMALLER FAMILY	100	3	60	20	0	40
12	2	SMALLER FAMILY	96.34	3	59.95	19.98	40	36.39
13	3	SMALLER FAMILY	119.34	3	59.9	19.97	77.99	59.33
14	4	SMALLER FAMILY	129.62	3	59.86	19.95	140.43	69.76
15	5	SMALLER FAMILY	141.78	3	59.81	19.94	215.81	81.97
16	6	SMALLER FAMILY	148.48	3	59.76	19.92	306.41	88.71
17	7	SMALLER FAMILY	140.7	3	59.71	19.9	407.38	80.98
18	8	SMALLER FAMILY	189.46	3	59.66	19.89	504.66	129.8
19	9	SMALLER FAMILY	210.28	3	59.62	19.87	654.65	150.66
20	10	SMALLER FAMILY	161.26	3	59.57	19.86	831.49	101.69

Computed Average Optimal Savings Rates: Larger Family = 0.535 Smaller Family = 0.560

Thus, over a period of 10 years of simulation horizon, it is observed that

- Per capita consumption expenditure is reducing for both large and small families.
- There is an increasing trend in income as well.
- There is an increasing trend in asset creation.
- So both types of families are trying to increase savings for a better future.
- However, it is clear that the growth in the savings rate in smaller families is higher than that in larger families.

8. DISCUSSION

Looking at all three simulated scenarios, we can see that the consumption smoothing of both types of families matches the Euler equation from the utility maximisation model (Curtis et al., 2017). Although different income levels create the best path for consumption growth, they have a less noticeable effect on consumption and savings levels.

- The percentage is higher for smaller families than for larger families. This suggests that an increase in savings is observed with nuclearization.
- For both small and large families, over a period of time, spending per family member steadily declines.
- Overall utility increases with increasing savings rates.

To determine per person consumption and long-term accumulation of assets, an important factor is family size (Curtis et al., 2017). Even if a smaller family starts with a lower, higher, or equal income level, as compared to a larger family, it consistently leads to an increased level of per capita consumption and better average optimal savings rates.

The consistency in the optimal rates of average savings under different conditions indicates the structural features of the inter-temporal optimisation problem and proves the endogenous nature of savings behaviour by preferences and constraints, and not only by initial income (Karlan and Morduch, 2014).

Such findings indicate that the maximisation of aggregate utility is maintainable at the nuclear family level, with variations in the size of a family systematically converting into divergent solutions in savings and accumulation of assets over time.

The outcomes of the simulation indicate that household behaviour does not change with inter-temporal utility maximisation in all cases because both large and small families are able to consume smoothly despite high changes in income (Chen et al., 2019).

This shows that breaking up families does not hinder the optimal expansion of consumption; instead, families use savings and asset reallocation, rather than reducing consumption, to soak up income shocks. However, the size of a household is a determining factor that does affect economic outcomes. Smaller families tend to show higher per capita consumption than larger families do, considering that both families have similar or lower income levels.

For both family types, per capita consumption gradually decreases with the passage of time. Rather than a real drop in well-being, this trend is directly linked to an increase in savings. (Jain 1997; Karlan and Morduch 2014).

Regardless of the initial income, all our simulations show that people living in small nuclear families save more money (0.560) than those living in large families (0.535). Based on the simulation results, we can see that smaller families have a higher rate of saving, which subsequently leads to faster asset growth (Cohen et al., 2022).

The results of the simulations show that even after households split into smaller units, they can still maximise total utility and smoothen consumption. Keeping this in

mind, it should also be mentioned that changes in the size of a family directly affect the welfare of an individual, habits when it comes to saving, and the accumulation of wealth by each family member. Even when income growth patterns remain unchanged, there is a definite impact on financial security and capital development caused by moving from a joint family structure to a nuclear family setup (Singh, 2003; Kapoor, 2014).

9. CONCLUSION

We have developed a utility maximisation model with this research, which shows how Indian families have adjusted their economic practices as they have had to move from joint families to smaller nuclear units. The effect of family size on utility was demonstrated using per capita utility models. Changes in consumption patterns, savings behaviour, and accumulation of assets during a time of uncertain growth in income have also been demonstrated by these models.

Our findings show that all cases demonstrate smoothing actions regarding consumption. These actions show sound decision-making, taking into account different time periods and uncertain conditions (Curtis et al., 2017; Chen et al., 2019). The growth trend in consumption remained steady for both large and small families. Even though a household is divided into smaller units, the basic optimisation rules remain the same, as suggested by household arrangements being affected by fluctuations in income.

Although family size is a huge structural factor for economic competency, all three simulation conditions show that smaller nuclear families display higher economic performance. They have elevated consumption levels per person, are at greater average optimum saving rates (0.560 vs. 0.535), and accumulate assets faster than larger families (Cohen et al., 2022). These disparities exist irrespective of whether the smaller family starts with lower, higher, or equal income, and thus it is clear that the demographic setup, and not the initial endowments, is the cause of the long-term economic pathways.

The trend of dwindling per-capita consumption over time by the two types of families also indicates rational precautionary saving habits, as opposed to a decline in welfare (Jain, 1997; Karlan and Morduch, 2014). Consumption changes negatively in households to accumulate a buffer of protective assets against uncertainty in future income, especially following nuclearization, because the traditional joint-family insurance mechanisms are deteriorating (Singh, 2003; Singh, 2012).

One of the significant theoretical contributions of this work is evidence of the ability to preserve aggregate utility maximisation following household fission, even when nuclear families are significantly different in terms of size and income. The per-capita utility model simplifies meaningful welfare contrasts within disparate household configurations, while maintaining the additive separability of aggregate family welfare. The rationale for the modelling method indicates that the phenomena are most effectively analysed at the nuclear family level. These findings have significant policy implications. Household saving and accumulation methods are changing, which impacts welfare efficiency but does not necessarily negatively affect household welfare during India's demographic transition toward nuclear family structures (Chakravorty et al., 2021; Kapoor, 2014).

Nuclear families that are smaller gain advantages from enhanced per capita consumption, and the faster accumulation of assets indicates improved individual welfare; however, in the short run, the lack of traditional risk-sharing systems, compelling households to self-insure by increasing precautionary savings, may result in consumption being suspended and, therefore, strengthen financial resilience over time (Karlan & Morduch 2014; Morris 1984).

Macroeconomically, nuclearization can raise the aggregate rates of savings because a greater number of households will have a propensity to save more because of the increased savings tendency of smaller units. This might boost capital formation and support long-term economic growth but comes at the cost of reduced current consumption (Curtis et al., 2017). These factors should be considered by policymakers when designing social security systems because nuclear families lack the informal insurance that joint families used to provide in earlier times (Singh, 2003).

9.1 Limitations and Future Research

This study has a number of limitations which point to future research directions. First, the model is based on the assumption of complete divisibility of assets and capital markets, which is not always the case with Indian households. Liquidity constraints, credit market imperfections, and transaction costs may be used in the future (Karlan and Morduch, 2014).

Second, the study concentrates on the splits of two-family exogenous family sizes. These extensions may simulate endogenous fertility choices, multi-generational, or more intricate household formation (Caldwell, 1982; Chakravorty et al., 2021).

Third, the model does not consider the decisions of labour supply, gender inequalities in the allocation of household resources, and bargaining within the household all of which have a considerable impact on consumption and savings among Indian families (Singh, 2012; Raijas, 2011a).

Fourth, the simulations do not directly model health shocks, unemployment waves, or catastrophes which can disproportionately impact nuclear and joint families (Oldroyd et al., 2022). Future studies can determine how household structures respond to different kinds of economic shocks and whether the informal insurance benefits of joint families surpass the savings efficiency of nuclear structures under some conditions.

Lastly, household panel data would be of use in empirical validation to bolster trust in the predictions of the model. Longitudinal studies that follow the families before and after these real household fission incidents can be used to determine whether the savings and consumption pattern is actually as predicted by the theory (Singh, 2012; Jain, 1979).

9.2 Concluding Remarks

The transformation of the Indian family structure from joint to nuclear arrangements represents a fundamental reorganisation of economic decision-making units with lasting implications for household welfare, savings behaviour, and asset accumulation (Singh, 2003; Chakravorty et al., 2021). This study demonstrates that while optimal intertemporal behaviour persists after household fission, the demographic structure systematically shapes economic outcomes in ways that conventional models often overlook.

By explicitly incorporating family size into utility specifications and allowing for endogenous savings determination, the model provides a rigorous framework for analysing how demographic transitions influence household economics. The findings emphasise that family structure deserves greater attention in both theoretical models and empirical analyses of household behaviour, particularly in contexts such as India, where rapid social and economic change continues to reshape traditional living arrangements (Kapoor, 2014).

As India's demographic transition continues, understanding these dynamics has become increasingly important for households, policymakers, and researchers seeking to promote economic welfare, financial stability, and sustainable development in a changing social landscape.

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