ASSESSING THE MACROECONOMICS IMPLICATIONS OF THE UNIFIED PENSION SCHEME IN INDIA: AN ANALYSIS OF THE EFFECTS ON FISCAL SUSTAINABILITY

- *Pranay Agarwal*[1]

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ABSTRACT

The fiscal impact of pension schemes has long been a subject of concern for policymakers due to their significant role in shaping public expenditure and economic stability, with the debate on welfare and efficiency continuing in this aspect as well. In this direction, the newly introduced Unified Pension Scheme (UPS) was expected to give perfect solutions to the problems rather than to escalate the problems further. In light of the present circumstances, the study presents an opportunity to evaluate the interplay between fiscal sustainability and individual financial behaviour through the empirical methods of debt sustainability analysis and cross-sectional regression.

The findings are intended to advise policymakers for balancing fiscal prudence with broader socioeconomic goals of pensionary reforms. Concepts of behavioural economics and comparative analysis comprising the case studies of the US, Sweden and Argentina are also made to give valuable insights and recommendations for successful pensionary reform.

Keywords: Unified Pension Scheme (UPS), National Pension System (NPS), Fiscal Sustainability, Auto-enrolment, Three-pillar approach.

[1] **Corresponding Author:** Fifth-year student pursuing B.A.L.L.B. from Gujarat National Law University, Gandhinagar. Email Id – pranay20bal068@gnlu.ac.in. ORCID Id - https://orcid.org/0009-0003-5711-5212.

1. INTRODUCTION

Old age security plays a significant role in a welfare state, with pensions being one of its key components. Developed countries usually provide a pension scheme which caters to the needs of old-aged people working in all kinds of jobs depending on the contribution of the workers to the pension scheme, whereas developing countries have to refrain from such practice given the minimal contribution an ordinary worker would make in the process (Schwartz & Kant, 2010). In this situation, countries like India resort to targeted or voluntary pension funds where the benefits are initially given on a discretionary basis (Sanyal & Singh, 2013).

The pensionary benefits in India can be classified into defined contribution and direct benefit. In this case, the subscribers are more involved in funding the scheme than the latter (Watson, 2008). Nonetheless, both pension schemes create long-term liabilities by their nature, restarting the debate on fiscal sustainability and social welfare (Blake & Orszag, 1988). The recently introduced Unified Pension Scheme (UPS) is endeavoured to be implemented in an environment where India is already facing pressures to maintain fiscal discipline amidst competing demands for social welfare spending. In this direction, an economic analysis is warranted to evaluate the fiscal sustainability as has been legally mandated and the impact on economic growth on both micro and macro levels, thereby assessing its long-term viability.

The scope of this paper, therefore, is to provide a comprehensive micro and macroeconomic analysis of the UPS scheme in India. The paper will primarily focus on the design, structure, and implementation of the UPS scheme and explore its effects on national savings, investment behaviour and fiscal deficit. While primarily focused on the Indian context, global comparisons with pension systems in other developed as well as emerging economies provide a broader perspective. The analysis is based on available theoretical frameworks and secondary data, ensuring a detailed exploration of the pension scheme's sustainability. By examining the long-term fiscal health of the UPS, the paper also aims to highlight potential areas of reform or enhancement in India's social security landscape.

In this regard, the paper has adopted both doctrinal as well as empirical methods to evaluate the pension schemes in India. On the doctrinal side, the author has applied principles and theories of behavioural economics along with the supporting data to comprehend individual financial behaviour towards income and savings. The empirical analysis has been conducted in the form of applied Debt Sustainability Analysis and time series regression to understand the impact of the pension schemes (OPS and NPS) on the deficits and debts of the country. Given the UPS scheme is still on the road to implementation, the empirical analysis is forecasting in

nature based on the trends shown by the data of both OPS (Old Pension Scheme) and NPS (National Pension System) regimes. The research also employs a comparative analysis for analysing pension schemes from countries with similar economic contexts and draws lessons for potential improvements in the Indian pension schemes.

In light of a comprehensive and organised analysis of the scheme, the paper is structured as follows. Section 2 provides a historical perspective on social security while also referring to the comparison of past and present pension schemes, including the UPS. In Section 3, the microeconomic perspective has been covered to analyse the financial behaviours of individuals through behavioural economics. Section 4 provides an evaluation of the fiscal impact of UPS on government finances and its long-term sustainability, and for that purpose, empirical analysis has been conducted in the form of time series regression as well as debt sustainability analysis. Section 5 assesses the UPS scheme in light of a comparative study of successful pensionary reforms conducted in other countries. Section 8 concludes the findings and analysis and gives final recommendations on the policy.

2. PENSION SCHEMES IN INDIA: FROM OPS TO UPS

Since the pre-independence era, chronically high levels of poverty and unemployment have precluded India from establishing a comprehensive social security system to safeguard the elderly from economic hardship (Rajan & Prasad, 2008). Therefore, historically, India has implemented a pension system that is primarily dependent on the monetary contributions made by both employers and employees. Nonetheless, the history of the pension schemes dates back to the Colonial period, when the schemes were largely centred on government employees.[2] After independence, retirement schemes like provident fund, gratuity and pension schemes were launched, thus giving primacy to the occupation and the earnings of the employee (Rajan & Prasad, 2008).

Pensionary benefits were still limited to the public sector workers on a defined benefit basis. In this regard, the private sector employees were less fortunate. The Employees' Provident Fund (EPF) was based on a defined contribution system, requiring employees also to contribute to the fund from their salaries (Jain, 1997). Much less fortunate were the unorganised workers who had access to only voluntary schemes offered by the insurance companies. On these lines, the formal, old-age income security system in India can be classified into three categories:

[2] The Royal Commission on Civil Establishments did not grant government employees pension benefits until 1881. These programs were expanded upon by the Government of India Acts of 1919 and 1935. It was eventually combined and made available to all public sector workers as a retirement benefit plan. After independence, many provident funds were formed to increase coverage among private-sector workers (Goswami, 2001).

upper tier (public sector employees), middle tier (private sector employees) and lower tier (unorganised sector workers) (Goswami, 2001, p. 5-7).

As time went on, though, the pension reforms were considered; however, their execution was marked by a great deal of inconsistency and ad hocism. It has been concluded by some researchers that perhaps the actions were indeed intended for sequencing the overall financial sector reform process, and the inconsistencies were due to the hit-and-trial runs given the complex nature of the pension reforms (Bali, 2014). The 1990s saw some advancements in this area, including the launch of the Employees' Pension Scheme (EPS), the Bank Employees' Pension Scheme (BEPS), and the Insurance Employees' Pension Scheme (IEPS).

The EPS, which was a defined benefit program, was not only mandatory but also provided with the lump sum EPF option, which, though initially sounded attractive, the mounting pension expenditure finally exploded in 1998-99 to discontinuation of the scheme (Singh, 2013). While in 1998, the Old Age Social and Income Security (OASIS) was being commissioned, demand for a fully funded, defined contribution scheme was being raised by the Indian Pensions Authority (Bhattacharya, 2008).

A systematic approach in this regard was taken in 2004 with the introduction of the NPS scheme for the central and state employees joining post-2004. Unlike the then-existing pension funds of the government, which offered assured benefits, NPS is based on the defined contribution and market-linked approach that provides higher returns but does not guarantee a fixed pension amount.[3] The basic difference between the old and new schemes is that while the earlier system was direct benefit and stability, the new one has included a facet of employee contribution and investment returns.[4] The government has implemented several policies to protect the interests of NPS subscribers, such as a flexible investment framework, the creation of a regulatory agency, and the construction of an affordable, modern NPS infrastructure (Kim et al, 2012).

[3] According to the Department of Financial Services, NPS contains the provision for receiving accumulated savings along with market-linked returns with no fixed pension amount. Moreover, the government contribution is low at 14%, with employees contributing at 10%.

[4] According to the Department of Financial Services, contrary to NPS, OPS contains the provision for receiving a pension of 50% of the last drawn salary. Moreover, the scheme was of a direct benefit nature with no employee contribution. In this regard, UPS is a hybrid of both OPS and NPS where the policy gives the following conditions:

- The scheme provides for a 50% assured pension over Basic Pay last drawn over the last 12 months before superannuation. For that purpose, a minimum qualifying service of 25 years is required.
- The scheme provides for an assured minimum pension of Rs 10, 000 per month for employees with a minimum of 10 years of service
- The scheme provides for Inflation indexation where the pension will be adjusted based on the CPI – IW. However, this component is applicable only for employees with more than 25 years of service.
- The scheme provides for a higher govt contribution which increased to 18.5%.. In this regard, the employee contribution remains the same at 10% further coupled with the amount of Dearness Allowance.

Unfortunately, the contributory new pension program has received a lukewarm response thus far, with its expansion limited outside the domain of government employees. It has been unsuccessful in reaching individuals who cannot save for long-term consumption (Pandey, 2018). Further, less than half the states have notified their intention to implement the NPS for their respective state employees, with only some states – Assam, Bihar, Jharkhand, MP and Chhattisgarh mandating the NPS for their employees, with some others offering an optional basis (Kim et al, 2012, p. 112-128). From a social welfare perspective, it is considered that the NPS's "welfare" orientation goal is defeated because it does not even provide a minimum pension.[5]

In response to the lukewarm response to the pension reforms and several academicians recommending reforming the new policy reforms, the Somanathan Committee suggested the UPS for the first time in 2023 by incorporating the best practices of both OPS and NPS,[6] thereby locating a middle path in between both the schemes. With the new UPS policy being proposed and accepted by the Cabinet, the government seeks to provide a more streamlined and equitable pension system, offering consistent benefits across sectors while addressing some of the core issues raised in the context of the NPS. One of the central goals of the UPS is to reduce the administrative complexities that have plagued the NPS and other state-specific schemes, which often result in delays and inconsistencies in pension disbursements (Magazine, 2024). A unified system would ensure that all beneficiaries receive similar benefits, irrespective of their sector of employment or geographic location.

Furthermore, an important aspect of the UPS is the return to stable pension schemes rather than the market-linked NPS while retaining the defined contribution model of the scheme. This, in turn, could alleviate one of the major concerns surrounding the NPS— that retirees' post-retirement income may be insufficient or inconsistent due to market performance. Nonetheless, the scheme has not been received well among the employees who demand the return of the direct benefit schemes (OPS) (Sharma, 2024).

3. BEHAVIOURAL IMPACT OF UPS

[5] It is for this reason that the government came out with the Atal Pension Yojna (APY) as per which the pensionary benefits were extended to private employees and unorganised workers through a defined contribution scheme. However, it is a non-market linked scheme unlike the NPS and further the benefits only range from Rs. 1000 to Rs. 5000 on attaining the retirement age of 60 years, thereby negating the scope of voluntary retirement. Nevertheless, the contributors are eligible for similar tax benefits as the NPS subscribers.

[6] While the report is still yet to be submitted, the suggestions have been given directly to the Cabinet which the Cabinet Secretary has later revealed (Magazine, 2024).

The retirement planning process is too painstaking, with individuals or families taking months or even years of thought, ideas, and discussions before their first major decision that will improve efficiency and welfare. Planning for retirement is intricate, and the major decision has always rested with individuals, so it gives rise to an analytically important issue of analysing any pension scheme's behaviour pattern to ascertain the macroeconomic impact of UPS.

a. Nudge Theory

The nudge theory considers that slight changes in the environment, be it in terms of defaults, framing, or presenting choices, substantially affect outcomes, especially when people are faced with abstract or multi-period decisions (Cai, 2020). Rather than relying on mandates or penalties, nudges exploit these predictable biases to help people make choices that serve their long-term interests (Abdukadirov, 2016).

In terms of UPS, the other significant behavioural challenges include procrastination or delaying retirement savings with present bias where immediate consumption precedes long-term financial security. In this sense, automatic enrolments to the UPS could be a good nudge nudging savings behaviour of people at the initiation stage of saving without feeling that they have to go through the inconvenience of the necessity for actively opting into it. Contributions at default rates could also be a second nudge that the scheme might be giving to the participants to keep them steadily saving and thus overcome the impediments from inertia and be well-prepared for retirement. This is further supported by the studies conducted in the USA and New Zealand, where few workers moved out of their occupational pension plans (Szczepanski, 2018).

b. Prospect Theory

The theory states that people make different judgments regarding potential gains and losses in comparison to each other, relying on the separate principle of loss aversion, according to which individuals are more sensitive to possible losses than equivalent gains (Levy, 1992). A crucial reflection of prospect theory concerns how individuals overestimate outcomes with low probability and undervalue those with high probabilities (Levy, 1992). This introduces the value function, concave for gains and convex for losses and shows that people take much greater risks to avoid losses than to obtain gains, deviating from the rational choice theory.

Even though people realise that contributing to a pension is good for them in the long term, an immediate reduction in disposable income may be framed as a loss, and hence, such people procrastinate or make lower contributions (Hardcastle, 2012). Policy interventions, like matching contributions or concentrating the future monetary benefit of saving, could minimise

this loss aversion by framing the contribution decision as one of gain rather than one of loss. In addition, an American study has shown that framing the options selected in a manner that emphasises likely losses or gains helps workers choose the correct pension option (Szczepanski, 2018; Kahneman & Tversky, 2013).

The risk aversion behaviour brought about by this response of loss aversion may prevent them from optimising their retirement savings. Policymakers can address this by providing default investment options that balance some degree of risk and reward or offering contextual financial education that assists the individual in making a better decision. A clear understanding of what drives perceived risk and loss aversion will further enable UPS to better design its structure so it fits with the psychological tendencies of savers.

c. Hyperbolic Discounting (Present Bias)

Hyperbolic discounting is the cognitive phenomenon whereby people prefer smaller immediate rewards to larger delayed rewards-they discount the immediate benefit less than later ones (Rubinstein, 2003). This leads to instant gratification choices: people choose to spend money now rather than save for retirement, as the total long-term payoffs of saving are dramatically greater (see Fig. 3.1). This temporal bias then results in suboptimal choices because the potential benefits of incredible future payoffs are given up for satisfaction now (Newall and Peacey, 2021).

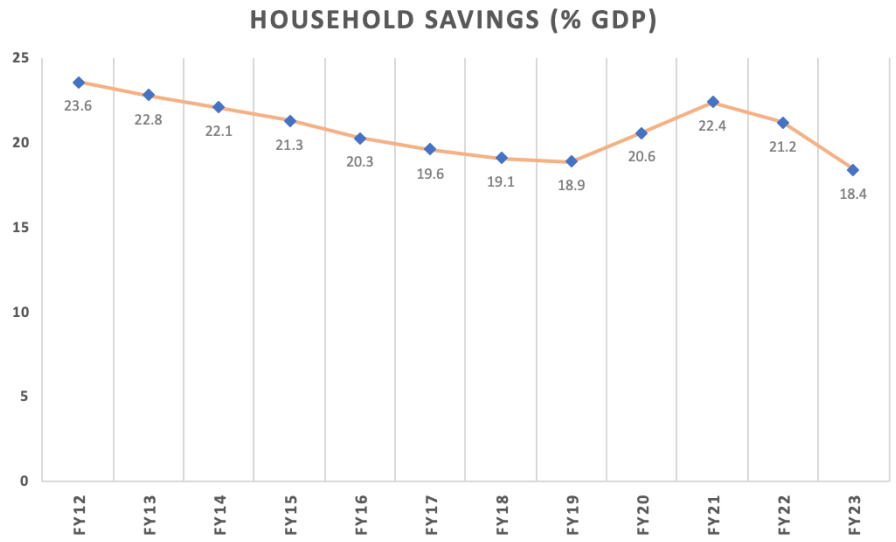

Figure 3.1: Trends in Household Savings as % of GDP

Source: NSE, CEIC and CRISIL

Such a phenomenon that has been generally associated with hyperbolic discounting has some important implications for the design and implementation of the UPS. The tendency on the part of people to favour current rewards may discourage them from participating in pension plans because they are not willing to allocate even any portion of their income towards saving at this age, which does not go towards generating any immediate benefits (see Fig 4.1). As a countermeasure to this behaviour, features that facilitate commitment towards long-term savings through automatic enrolment in pension plans or default contribution rates that increase over time can be integrated into the UPS. It is strategic because it uses the insights of behavioural psychology to overcome the immediate appeal of consumption by building a structure favouring long-term savings.

d. Status Quo Bias

Status quo bias refers to the inclination of individuals to favour the existing situation rather than embrace change, even when such change could yield significant advantages, due to concerns or perceived risks (Samuelson & Zeckhauser, 1998). A case in point is the UK's auto-enrolment pension scheme, wherein more than 90% of the subscribers continue with the default contribution rates and investment allocations (Price, 2008). The individuals may prefer to maintain their financial practices or investment plans the same even in the light of better alternatives that could potentially yield efficiency or value because the individual perceives any change as risky, resulting in sub-optimal results (Price, 2008).

UPS may still alienate people from what they are used to and, therefore, continue sticking to the current pension arrangements despite the probable benefits of UPS in terms of financial sustainability and longer-run returns. To overcome status quo bias, the UPS could have default enrolment or auto-switching, so people are enrolled into the new system unless they specifically opt out. Also, clear and continued communication of the benefits of the UPS, especially about how it compares to older schemes, can help alleviate concerns and build confidence in the new system.

4. FISCAL SUSTAINABILITY OF UPS: IS IT OR IT ISN'T?

Pension liabilities make up a rapidly increasing proportion of general government expenditures at a time when demographic transition in the country is taking place at a quickened pace, thus exerting strain on public finances. In the absence of prudent management, the pension expenditure burden might jump sharply, thus leading to higher deficits, reduced capital investments, and possibly inflationary deficit financing.

Pension, welfare and behavioural economists have taken sides considering the debate on the fiscal sustainability of expansionary pensions and the demand to revert to the direct benefit model (Asher, 2008). From the traditional CBA, individual workers are likely to be more in favour of the OPS (Direct Benefit Scheme), while the government will be more interested in the UPS (Defined Contribution Scheme).

However, from the point of an economist, the CBA will not yield any desired results with costs and benefits changing and substituting on varied perspectives. With limited empirical studies available, it is pertinent to conduct a suitable debt sustainability analysis as well as other methods of regression to test the proposition of either side statistically (Ranganathan, 2017; Narayana, 2014; Asher & Zen, 2016).

a. Debt Sustainability Analysis

The object of the DSA is to compare the two pensionary regimes of OPS and NPS on the lines of the devised model to address the question of – Which pension scheme is more debt-sustainable. The author has collected data from the last five years before the launch of a new regime, i.e. FY2015 to FY2019 (NPS) and FY1999 to FY2003 (OPS).[7] Moreover, the author has used secondary sources of data collected from authentic government documents and online websites, which include Annual economic surveys, Annual union budgets and documents of RBI and CEIC.

i. Model Specification

The author has established a model as per the classical theories behind the DSA. Given the object of the analysis is to study the effects of OPS/NPS on the total fiscal deficit and debt accumulation, variables including Fiscal deficit, Debt stock, Pension liabilities, GDP growth and Interest rate should be incorporated into the model. Therefore, the model is as follows –

$$\Delta Debt_t = (g\text{-}r)/(1+g) * Debt_{t-1} + Fiscal\ Deficit_t$$

where, $\Delta Debt_t$ = Change in debt as a percentage of GDP

$Fiscal\ Deficit_t$ = Fiscal deficit

$Debt_{t-1}$ = Debt to GDP ratio of the previous year

[7] The author has intentionally refrained from including FY2020 to FY2023 in the case of NPS for the purpose of analysis. With economic factors like GDP in negative during COVID (FY2020 onwards) and growth rates calculated with previous year figures as a base, a huge inconsistency was found, which was attributable to the natural circumstances (COVID19).

r = Real interest rate on govt debt

g = Real GDP growth rate

The model was devised by following the principles of debt dynamics that the change in the debt-to-GDP ratio is influenced by the difference between interest payments on the existing debt and GDP growth, adjusted by the primary balance, which gives the basic model (Debrun et al., 2019). To achieve the objective, variables like inflation, fiscal deficits, and other revenue expenditures were added to refine the primary balance term to include the revenue and expenditure impacts of the pension scheme. Further, it is pertinent to note that the author has chosen a baseline scenario where it assumes the current rate of pension liabilities under the pension scheme and projects the debt accumulation under typical economic conditions.

ii. Results

The DSA exhibits the trending of interest-growth differential, determining critically the sustainability of debt. As shown by Fig 3.1, from 2015 to 2019, the interest-growth differential is negative, meaning that the real GDP growth rate (g) surpasses the real interest rate on government debt (r). This bad differential, therefore, means the government is in a relatively better position to service debt. The highest adverse differential was recorded in 2015 at -0.58, followed by diminishing but still adverse values for subsequent years. This means the economy was growing fast enough to keep debt levels manageable, provided the fiscal deficit was kept under control. However, this debt-to-GDP ratio has risen at the end of the period under review to 52.3% in 2019 (see Annex B). This could signal potential problems in the future, assuming that growth is decreased or interest rates rise.

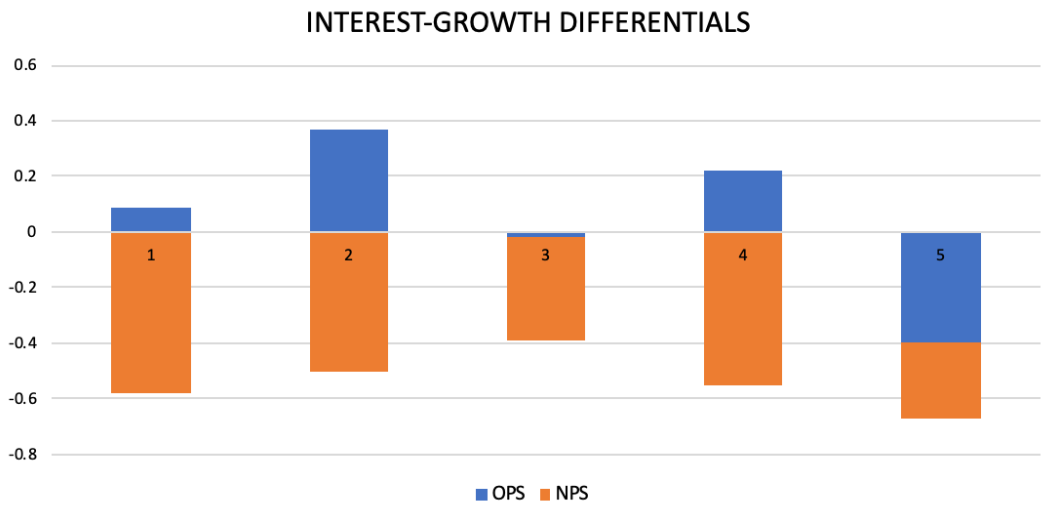

Figure 4.1: Interest-Growth Differentials in both OPS and NPS regimes

Source: Author's own Construction

The earlier period appears distinct. The differential of interest growth is more fluctuating and positive at times, such as in 1999 and 2000 (0.09 and 0.37). These positive differentials indicate that real interest rates on government debt were higher than real GDP growth over such years, which indicates unsustainable debt dynamics. Even though the fiscal deficit decreased over time, the ratio of debt to GDP increased significantly, reaching 84.2 per cent in 2003 (see Annex B). Such a high, fast increase in the change in debt ($\Delta Debt_t$) captures an unsustainable situation with debt, maintaining a balance between growth and debt-borrowing costs so as not to face increasing unsustainable debt burdens that can quickly become unsustainable in case of increased interest rates or a decline in growth (Fig. 3.2).

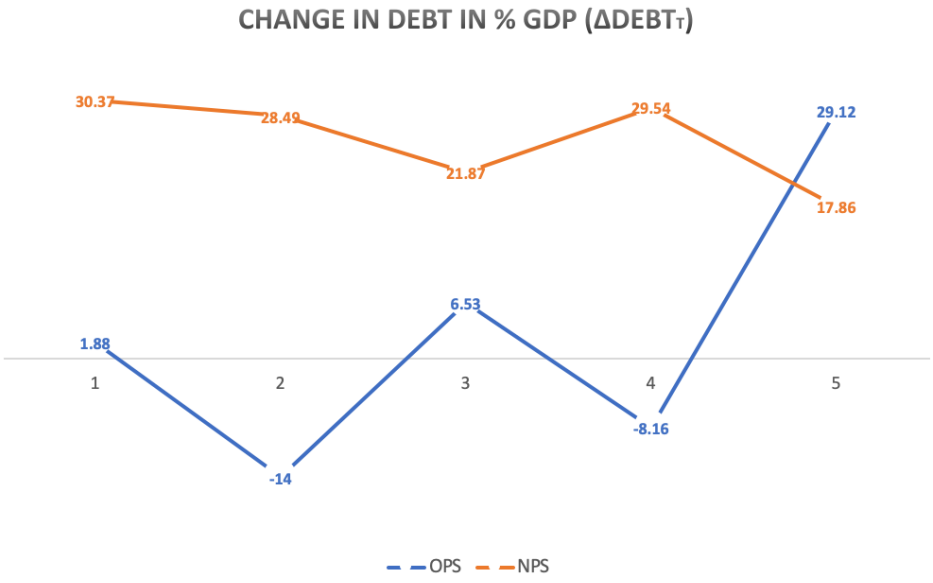

Figure 4.2: Changes in the debt in proportion to GDP under both OPS and NPS regimes

Source: Author's own Construction

This more recent period (2015-2019) saw the Indian government sustain debt through robust growth of GDP and low interest rates, even though fiscal deficits remained steady (see Annex B). The sharp increase in the debt-to-GDP ratio in 2019 raises long-term sustainability concerns, especially if growth slows or if fiscal discipline weakens. Enhancing ongoing reforms that would help boost economic growth, even as fiscal deficits are controlled, is therefore important. This underlines the policies to make borrowing costs manageable relative to growth and to avoid a repetition of the unsustainable debt dynamics of the early 2000s.

b. Cross-Sectional Regression

i. Model Specification

The basic cross-sectional regression model has been adopted for deciding the proposition as set out by the author earlier in this chapter. The model consists of a dependent variable, i.e. Revenue Deficit (RD) and ten independent variables. The independent variables can further be classified into expenditure variables, control (economic) variables, dummy variables and interaction variables. A detailed description of the variables is provided in Annexure A. The dummy variable (D_PS) is introduced in the model, with 0 indicating the 2004 period (OPS regime) and 1 indicating the 2004 period (NPS regime). The two interaction terms of pension variable with OADR and dummy variable (D_PS), respectively. While the former will indicate whether the effect of pension expenditure on the revenue deficit is amplified or mitigated by the ageing population, the latter will capture how the effect of pensions may differ depending on the demographic transition. Thus, my regression model looks as follows:

$$RD_{it} = \beta_0 + \beta_1 Pension_{it} + \beta_2 Salaries_{it} + \beta_3 Def\_Exp_{it} + \beta_4 Debt\_Service_{it} + \beta_5 GDP_{it} + \beta_6 Inflation_{it} + \beta_7 D\_PS_t + \beta_8 (Pension_{it} \times D\_PS_t) + \beta_9 OADR_{it} + \beta_{10} (Pension_{it} \times OADR_{it}) + \gamma_t + \epsilon_{it}$$

Further, as the model is adjusted to time series data, coefficient γ_t is introduced to account for time and entity constant factors, respectively. The study, apart from the linear (LS) regression, has conducted several other tests to check the suitability of the model and avoid wrong presumptions about the results.

Firstly, an ordinary correlation analysis was conducted to establish the magnitude of the correlation between the dependent variable and independent variables. The results indicate that several independent variables show a high degree of correlation among themselves (Annex C), thus necessitating the serial correlation LM test. In this regard, the author has considered both 2 and 3 lags as per the appropriateness of data. The results indicate a p-value > 0.05, indicating no serial correlation (Annex D). Secondly, the heteroscedasticity of the model is tested through the Breusch–Pagan–Godfrey (BP) test (Annex E). Fourthly, the normality of errors is tested through the Histogram, Skewness and Jarque-Bera test, as well as the Q-Q plot of the residuals (Annex F).

ii. Results and Analysis

The coefficients in the regression results indicate that pension liabilities have a tremendous fiscal effect since, for all three specifications of pension, the coefficient is not only positive but

also statistically significant (p-value <0.05). This means the more that pension obligations are heightened, the greater the revenue deficit, and hence, pension weighs heavily upon public finances. Salaries also have a very strong positive and significant correlation with the deficit, meaning that the wage bill of public servants is the biggest player in inducing the idea of fiscal pressure. Further, defence spending significantly contributes to the deficit, which proves that core recurring expenditures are burdening public finances.

Interestingly, the debt servicing and subsidies, despite carrying negative coefficients, have not proven to be statistically significant, implying that alterations in these factors do not significantly change the deficit in this model. Nonetheless, the negative significance between real GDP growth and deficit suggests stronger economic growth does ease fiscal pressures, perhaps through more tax collection and better economic activity. Simultaneously, inflation adversely impacts the deficit, as expected from the view that moderate inflation lowers real levels of debt and hence relieves the fiscal burden.

Variable	Coefficient	Standard Error	t-Statistic	Prob.
Pension	33.97819	8.377639	4.055820	0.0384
Salaries	7.191857	1.240930	5.795538	0.0006
Def_Exp	11.55359	2.851996	4.051054	0.0000
Debt_Service	-0.855409	0.886628	-0.964789	0.3456
Subsidies	-0.399139	0.242588	-1.645338	0.1148
Real_GDP	-0.231138	0.065343	-3.537287	0.0020
Inflation	-0.089013	0.042918	-2.074030	0.0506
Pension * D_PS	0.481687	0.742298	0.648914	0.5234
OADR	1.794070	0.540632	3.138466	0.0033
Pension * OADR	-2.798439	0.587452	-4.763686	0.0001

R-squared	0.848087	Mean Dependent VAR	3.356250
Adjusted R-squared	0.775748	S.D. Dependent VAR	1.161183
S.E. of regression	0.549881	Akalke Info Criterion	1.908058
Sum squared resid	6.349759	Schwarz Criterion	2.411905
Log Likelihood	-19.52893	Hannan-Quinn Criterion	2.075069
F-statistic	11.72373	Durbin-Watson Stat	1.884859
Prob(F-statistic)	0.000002		

Table 4.1: Time series regression results (1991-2022)
Source: Author's own Construction

The interaction terms between pensions and the old-age dependency ratio (OADR) and between pensions and the dummy variable yield further insights. The negative and significant interaction between pensions and OADR suggests that though there is an increment in the fiscal pressure due to ageing, there are dynamics like reforms or behavioural adjustments that decrease the fiscal pressure imposed by pension expenditures over time. On the other hand, the results indicate that pension expenditures and changes in regimes (from OPS to NPS) have no significant interaction, which implies that the regime change does not change the overall effects of the liabilities of pension on the fiscal deficit. Therefore, for final clarity, the author has provided a breakpoint test to test the proposition.

Regarding the fit of the model, the high R-squared value is 0.848, which indicates about 85% explanation of the variation in revenue deficits. Adjusted R-squared value at 0.775 provides similar evidence for the robustness of this model after adjustment to the number of predictors. The F-statistic in this case is highly significant, thus showing a statistically sound model. The standard error of the regression is low enough to give sound support to this reliability.

c. Breakpoint Test Results

The Breakpoint Test provides useful insights into whether the regression model is stable for the period in question or not. In this regard, the author has preferred a Chow breakpoint test for its ability to assess structural stability in regression models at specific time points (Chow, 1960). With the assumption of the null hypothesis that there are no structural breaks at the assumed breakpoint date of 2004, the computed F-statistic of 2.65 yields a p-value of 0.09. Thereby, although some structural change does exist, it is still not quite significant at conventional levels (i.e., 0.05). This would, therefore, imply that the parameters of the model differ before and after the year 2004, but the evidence in the table is not very strong to reject in favour of the null hypothesis of stability.

Chow Breakpoint Test : 2004			
Null Hypothesis: No breaks at specified breakpoints			
Varying regressors: All equation variables			
Equation Sample: 1991 2022			
F-Statistic	2.651804	Prob. F(2,28)	0.0882
Log likelihood ratio	5.550759	Prob. Chi-Square(2)	0.0623
Wald Statistic	5.303608	Prob. Chi-Square(2)	0.0705

Table 4.2: Chow Breakpoint Test results with breakpoint at FY2004-05
Source: Author's own Construction

The log-likelihood ratio of 5.55 also points to changes in the model structure as a function of the number of years with a p-value of 0.06. This outcome supports the suggestion that changes in economic conditions or policy frameworks have had an impact on the relationships found by the model. Again, using a Wald statistic of 5.3 with a p-value of 0.07 further supports this interpretation as possibly indicative of some noteworthy changes in the data-generating process after 2004, but certainly not at traditional levels of statistical significance.

The results of this study, in the context of the findings above, underscore a highly justifiable rationale for including time variables in analysing the impacts of pension schemes and other fiscal variables on economic indicators. Although the uninterrupted nature of the data may have hinted at certain continuities among the relationships over time, the p-values were closely located to the thresholds of significance; therefore, care has to be taken in this regard. Future analyses may be especially useful in studying which factors impact these potential structural changes, allowing for a more sophisticated interpretation of how policy or economic shifts affect pension scheme dynamics and fiscal sustainability.

5. PENSION REFORMS: A CROSS COUNTRY EXPERIENCE

Pension schemes for civil service employees across several countries vary significantly, however, the fundamental issues that sparked pension reform campaigns were largely analogous. While pension programs were originally designed for civil servants, the evolution of social security systems made it impractical to develop separate schemes for civil servants,

resulting in comprehensive pension schemes in various European and Latin countries (Bhattacharya, 2003).

Pension systems in most countries are based on the three pillars. The first tier denotes the universal statutory basic state pension system (Direct Benefit for welfare purposes); the second tier signifies the supplementary occupational pension system; and the third layer encompasses personal pension insurance and other savings. The pension schemes in the West are ordinarily financed through the Pay-as-you-go (PAYG) system (Defined contribution system). In most of the reforms initiated, three pillars are common – (a) unfunded mandatory, (b) funded mandatory and (c) voluntary private. However, a deeper analysis is required to understand the crisis every nation faces and the reforms to amend them.

a. USA

In the USA, the pensionary scheme was part of the Civil Service Retirement Scheme (CSRS), which started in 1920, much before the concept of a "welfare state" (Burt, 2008). Deriving on the New Deal of Roosevelt and the shift to a monetarist school of economics in 1983, new hires were transferred to the Federal Employees Retirement System (FERS), and existing employees were allowed to transfer (Burt, 2008; Purcell, 2007).

Under the FERS, employees may retire with reduced benefits at age 55 or 57, while under the CSRS, employees with 30 years of service may retire at age 55 with unreduced benefits. Additionally, a price-indexed retirement benefit is offered by the CSRS. It was discovered that federal employees with higher incomes had greater retirement benefit inflation indexation than private employees.

On the other hand, FERS offers a three-tier retirement plan that includes social security, a Direct Benefit plan, and the Thrift Savings Plan (TSP), a Defined Contribution plan. The US pension reform, in a sense, shares a success story, even taking into account the initial protests that ensured due to the inclusivity and greater scope of the scheme, privatisation of the pension scheme with private investments invited and enhanced portability of the federal employees.

b. Sweden

The Swedish pension system has a long history of trial and error, with revisions beginning in 1935 and concluding in 2001 (Pierson, 1996). The old Swedish pension scheme faced a crisis in the 1990s that stemmed from the unsustainability of its traditional pay-as-you-go (PAYG) system (Bergmark & Palme, 2003). The economic downturn of the early 1990s, coupled with

high unemployment and fiscal deficits, further exacerbated the problem (Pierson, 1996, p. 145). The existing system, which promised defined benefits, was no longer financially viable.

In response, Sweden introduced major pension reforms in 1994, transitioning to a more flexible and sustainable system (Viraj, 2018). The new system combined a notional defined contribution (NDC) model, where contributions were linked to individual earnings, with a funded component that allowed for personal investment accounts. However, the pension crisis, coupled with the Currency crisis of 1992, revealed the politicised nature of the pension reforms, which resulted in a blame-shifting game every time the reforms failed instead of learning from the lessons (Backstrom, 1997).

In response to these criticisms and search for an effective solution, the Swedish government adopted the three-pillar system – (a) PAYG notional defined contribution system, (b) privately managed individual accounts, and (c) guaranteed pension for individuals for low-income groups (Direct Benefit) (Palmer, 2000). By shifting part of the responsibility for pensions to individuals through personal savings accounts, the system incentivised greater individual savings and reduced long-term pressure on the state (Viraj, 2018, p. 22-27). Additionally, the introduction of automatic stabilisers, such as adjusting benefits based on life expectancy and economic growth, ensured that the system could adapt to future demographic changes without major overhauls.

c. Argentina

The pension system in Argentina originated in the early 20th century, initially covering specific worker groups. By the 1950s, labour policies, a growing internal market, and urbanisation expanded coverage but led to financial strain due to stagnant retirement ages and contribution levels (Betranou et al., 2011). A major reform in 1968 unified various schemes into three funds for self-employed workers, the public sector, and the private sector (Rofman, 2002). However, by the early 1990s, the system faced significant deficits, with unpaid pensions amounting to 3% of GDP (Bertranou et al., 2003).

In response, a two-pillar pension system was introduced – the first pillar, financed by employer contributions, provided a defined benefit administered by social security, and the second pillar provided defined contributions based on either PAYG or an individual savings account model. Initially, the economic boom of 1991-94 made these reforms seem promising. However, transition costs in light of the ongoing crisis in Mexico and Russia, coupled with Argentina's fiscal mismanagement, led to a financial crisis (Rofman, 2005).

The state struggled to control its income and expenditures, often resorting to printing more money, issuing debt, and using privatisation proceeds, ultimately triggering a financial crisis worsened by restrictions on withdrawals from banks and heavy losses in the financial system. Nevertheless, the lessons learnt by the government were highlighted in the new policy (Pension Moratorium), where the direct contributory approach on the lines of the three-pillar approach was adopted (Arza, 2012).

6. CONCLUSION AND RECOMMENDATIONS

In the complications of pension reforms lie deeper questions of economic security, social equity, and fiscal responsibility (Orszag & Stiglitz, 2001). The sustainability of pension systems becomes an important issue in the face of demographic transitions in which societies may change, reflecting broader economic and political dynamics of relevance to fiscal stability. Changes to pension schemes, and specifically the introduction of the UPS, can shift long-term fiscal stability and individual behaviour, which remains the question at the heart of this study. The findings of the empirical study (DSA and cross-sectional regression) suggest that the DC schemes (NPS) are more fiscally sustainable than the DB scheme (OPS), thus proving the endeavour of the government to relax the strain on public finances. On these lines, therefore, it can also be concluded that UPS, with its lesser employee contribution, will be a less sustainable option. However, at the same time, UPS is not a perfect solution that can satisfy the employees and become a significant cog in the wheel of economic growth and progress of the country.

In this regard, it is pertinent to note the individual perception towards the scheme as well as political motivations that surmise the debate of a new pension reform in India. Therefore, while the author is not propounding a new sustainable pension scheme to replace UPS, some final suggestions based on the detailed analysis in the above chapters are given, which can act as a guiding light for the policymakers –

a) Firstly, it is suggested that the DC should prevail over the DB scheme. In this respect, state contribution should remain minimal, with employer contribution being instead adjusted. Moreover, to resolve the issue of conflicting choices, the employees can be given either option, subject to the fact that DB scheme employees will get fewer retirement benefits through means-tested schemes than the DC ones.

b) Secondly, for shifting household savings to investments, lessons can be taken from NPS, which contains provisions for tax exemptions.[8] However, instead of a market-linked scheme, the employees can be given the mandate to invest a certain threshold of their pensionary income in the secured government bonds along with a provision of tax exemption on that part of income.
c) Thirdly, based on the various facets of behavioural economics, small amendments like automatic enrolment in the UPS can greatly contribute to higher savings and subscription rates, thus acting as a nudge.
d) Finally, the 3-pillar approach, as has been observed from the international practice towards pension reforms, should be adopted in India as well.

Apart from the suggestions, it should be pointed out that this study also suffers from several limitations which can be taken on in future studies. The most peculiar limitation was the absence of data in the UPS regime. In this regard, with the scheme still in the formulation phase, a proper investigation of fiscal sustainability can happen only after some years of its implementation. In this paper, the author has attempted to make a forecasting analysis and, therefore, suffers from various assumptions and biases, which need re-investigation.

The balance between long-term systemic sustainability and immediate social goals frames policy arenas worldwide. Understanding the interaction of these factors that pull institutions in various directions poses a fundamental inquiry into what constitutes progress, especially in studies of institutional reform. Systems that deal with uncertainty cannot excessively grapple between regarding individual welfare and increasing the overall pie, in a way, they must lead in unison. Given that societies must cope with changing demographics and fiscal constraints, the interaction of policy, economics, and human behaviour will continue to be key in addressing these persistent problems, thereby underlining the importance of transformative solutions beyond business as usual.

[8] The tax exemptions on the pension investments in the New Pension scheme (NPS) are currently provided under Section 80CCD(1B) of the Income Tax Act 1961.

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ANNEXURE

ANNEXURE A

Variables	Description	Source
RD	Revenue Deficit (% GDP)	Economic Surveys, MoF
Pension	Expenditure on pensions of central govt employees (in Lakh Cr)	Economic Surveys, MoF
Salaries	Salary expenditure of central govt employees (in Lakh Cr)	Economic Surveys, MoF
Defence Expenditure	Expenditure on salaries/pensions of defence personnel (in Lakh Cr)	Economic Surveys, MoF
Subsidies	Expenditure on social welfare schemes (in Lakh Cr)	Economic Surveys, MoF
Debt Service	Interest payable on the public debts (in Lakh Cr)	Economic Surveys, MoF
Real GDP	GDP not adjusted to inflation (in Lakh Cr/%)	Union Budgets, MoF
Inflation	Inflation rate (in %)	Press Information Bureau (PIB)
OADR	Old Age Dependency Ratio	MoSPI
Fiscal Deficit	Fiscal deficit (in %)	Economic Surveys, MoF
Debt to GDP Ratio		Union Budgets, MoF
Real interest on Govt Debt	Interest rate on govt debts not adjusted to inflation (in %)	RBI, CEIC

Table A.1: Source and description of the variables

Source: Author's own construction

ANNEXURE B

Year	Fiscal Deficit	Debt to GDP Ratio	Real interest on govt debt (r)	Real GDP growth (g)	$\Delta Debt_t$	Interest Growth differentials
2015	3.9	49.96	2.71	7.9	30.3748315	-0.583146067
2016	3.51	49.4	3.05	7.1	28.49	-0.5
2017	3.5	47.58	4.15	7.2	21.8743902	-0.37195122
2018	3.4	49.3	2.2	6.1	29.535493	-0.549295775
2019	4.59	52.3	2.8	4.2	17.8630769	-0.269230769

Table A.2: Debt Sustainability Analysis under the NPS Regime

Source: Author's own construction

Year	Fiscal Deficit	Debt to GDP Ratio	Real interest on govt debt (r)	Real GDP growth (g)	$\Delta Debt_t$	Interest Growth differentials
1999	6.5	51.35	7.08	6.4	1.876	0.091891892
2000	5.1	55	5.86	4	-14.0022	0.372
2001	5.58	61.09	5.29	5.4	6.5253125	-0.0171875
2002	5.3	61.7	5.59	4.4	-8.1624259	0.22037037
2003	4.57	84.2	4.72	8.5	29.1201053	-0.397894737

Table A.3: Debt Sustainability Analysis under the OPS Regime

Source: Author's own construction

ANNEXURE C

Correlation	RD	Pension	Salaries	Def_Exp	Debt_Services	Subsidies	Real_GDP	Inflation	OADR
RD	1.000000								
Pension	0.275957	1.000000							
Salaries	0.336923	0.973473	1.000000						
Def_Exp	0.228061	0.985247	0.951594	1.000000					
Debt_Services	0.238096	0.982231	0.985030	0.982598	1.000000				
Subsidies	0.495999	0.877401	0.883345	0.849194	0.854441	1.000000			
Real_GDP	0.172193	0.967919	0.930143	0.994161	0.972444	0.824717	1.000000		
Inflation	0.028861	-0.310447	-0.261821	-0.330752	-0.320171	-0.186806	-0.350982	1.000000	
OADR	0.183867	0.878771	0.887591	0.924482	0.929895	0.779610	0.934737	-0.337279	1.000000

Table A.4: Correlation matrix among variables

Source: Author's own comstruction

ANNEXURE D

Breusch-Godfrey Serial Correlation LM Test			
Null hypothesis: No serial correlation at up to 2 lags			
F-Statistic	0.056915	Prob. F(2, 19)	0.9448
Obs*R-squared	0.190572	Prob. Chi-Square(2)	0.9091

Table A.5: BG test for testing serial correlation up to 2 lags

Source: Author's own construction

Breusch-Godfrey Serial Correlation LM Test			
Null hypothesis: No serial correlation at up to 3 lags			
F-Statistic	1.5554	Prob. F(3, 18)	0.2348
Obs*R-squared	6.587713	Prob. Chi-Square(3)	0.0863

Table A.6: BG test for testing serial correlation up to 3 lags

Source: Author's own construction

ANNEXURE E

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
Null hypothesis: Homoscedasticity			
F-Statistic	2.148035	Prob. F(10, 21)	0.0673
Obs*R-squared	16.18092	Prob. Chi-Square(10)	0.0946
Scaled explained SS	7.49143	Prob. Chi-Square(10)	0.6784

Table A.8: BP test for verifying Heteroscedasticity

Source: Author's own construction

ANNEXURE F

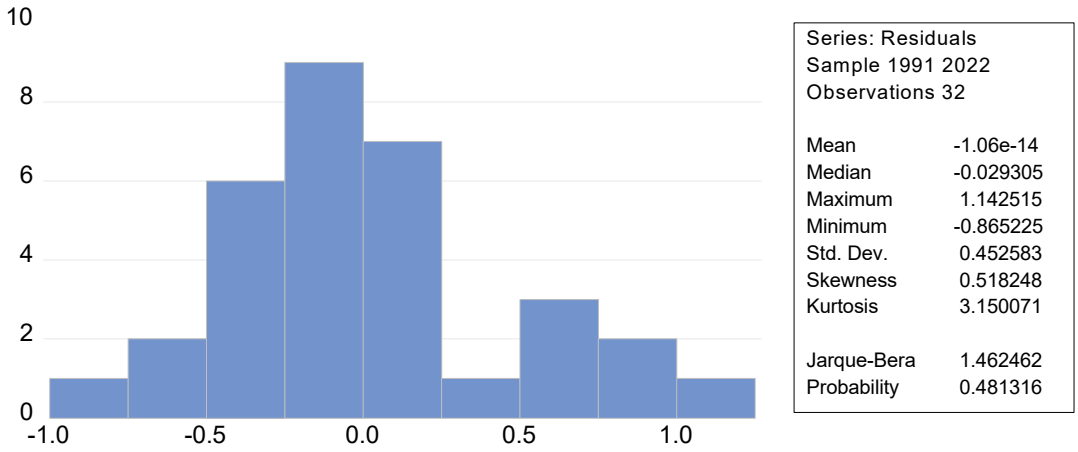

Fig A.1: Normality Histogram

Source: Author's own construction

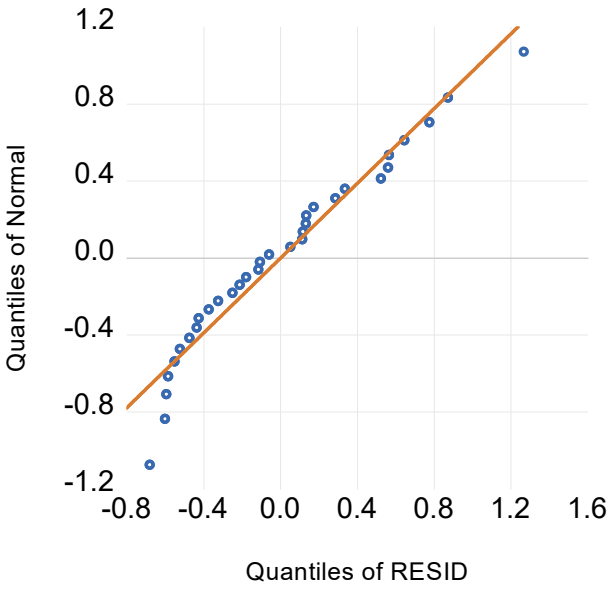

Fig A.2: Residual graph (Q-Q plot)

Source: Author's own construction