New age Pension Reforms and Household Consumption: Evidence from India

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Abstract

This paper studies the implications of India's 2004 pension reforms on the monthly per capita consumption of the reform-affected households by using variations in pension benefits that resulted from the reform. Empirical analysis, based on data extracted from the 1994-2012 Indian National Sample Surveys, reveals a substantial decline of approximately 27% in per capita household consumption among impacted households (the 95% confidence interval for this estimate spans from -65% to -18%). Furthermore, a supplementary investigation quantifies the interrelationship between Indian public pension wealth and private consumption, demonstrating that a marginal decrease of 1 INR (Indian Rupee) in pension wealth corresponds to a 0.0033 INR reduction in household consumption.

1 Introduction

Over the past three decades, numerous nations have reformed their public pension systems, primarily due to the dual factors of increasing life expectancy and declining fertility rates to ensure the long-term viability of these systems. These reforms have often been characterized by a transition from the traditional "defined benefit" pension models to the more contemporary "defined contribution" schemes. While these reforms

have been pivotal in safeguarding the solvency of public pension systems, a comprehensive assessment of these reforms requires addressing several other issues which includes a nuanced understanding of their impact on public savings and consumption patterns. The expectation is that pension reforms, by reducing pension disbursements, would potentially prompt households to curtail current consumption while increasing retirement savings. However, if that is not the case, the total post-retirement resources could diminish. The canonical Life Cycle Hypothesis predicts a perfect substitution relationship between future pension benefits and present household savings. However, it is to be remembered that this prediction rests on a series of strong assumptions, including, but not limited to perfect liquidity, absence of borrowing constraints, and exclusive savings for retirement. Given the prevalence of pension benefits in the form of monthly payments which inherently is not perfect liquidity, and considering factors like borrowing constraints and other motives to save, such assumptions tend to obfuscate the true picture. Consequently, the interplay between pension provisions, consumption patterns, and savings trajectories necessitates empirical exploration.

The Government of India, responding to recommendations from the Project Old Age Social and Income Security Committee, embarked on an ambitious pension reform endeavor on January 1st, 2004. This reform sought to replace the traditional defined benefit civil service pension scheme (now referred to as the Old Pension Scheme or the OPS) with the New Pension System (NPS) – a defined contribution scheme – for government employees. This paper endeavors to quantify the response of the consumption pattern of public sector employees to the shifts in the Indian pension landscape. This analysis is facilitated by the unique facet of the reform, which differently impacted public sector employees based on their entry date into government service. Individuals who joined central government positions before January 1, 2004 continued to be governed by the pre-reform OPS, while those who entered service after December 31, 2003 were incorporated under the NPS. This legislative demarcation led to the generation of a quasi-natural experimental setup which I use for my analysis.

The literature examining the relationship between pension wealth alterations and household consumption/savings confronts specific challenges, with two major issues standing out. Firstly, the presence of unobservable heterogeneity in consumption behaviour complicates analysis. Individual preferences for leisure

and retirement, in conjunction with idiosyncratic factors, can considerably influence consumption patterns. Secondly, quantifying pension wealth presents a formidable challenge, as highlighted by Gale (1998). Addressing these challenges, this paper employs a difference-in-differences design to estimate the impact of the Indian pension reform on household consumption, utilizing the NSS Employment and Unemployment Surveys (EUS) spanning 1992 to 2012. Although the EUS lacks explicit differentiation between NPS-covered and OPS-covered public workers, leveraging institutional insights helps in tackling this limitation.I also use the NSS EUS data to estimate the degree of substitutability between public pension wealth and private consumption. The empirical literature exhibits divergent findings regarding the extent of substitution, with differing estimates ranging from high degrees (-0.5 to -1) to lower degrees (0 to -0.5). This study contributes to this discourse by empirically estimating this degree of substitution within the Indian public pension system.

Given the quasi-experimental variation engendered by the pension reform, this study addresses a crucial contemporary concern, particularly within the Indian context. The NPS, despite its fiscal merits, has faced resistance among newer generations of public sector employees due to uncertainties surrounding pension payments. While the reform's fiscal significance has been widely discussed, empirical examinations of its influence on the savings and consumption behaviors of public sector employees remain scarce. Moreover, the adoption of the NPS by numerous Indian states, followed by subsequent reversals, underscores the need for rigorous analysis in this domain. This study, to the best of our knowledge, is the first to explicitly assess the NPS's impact on household consumption of public employees in India.

The paper's organization is as follows: Section 2 provides a contextual backdrop of the Indian pension system and the reform under scrutiny. Section 3 surveys pertinent literature, while Section 4 presents descriptive statistics. Section 5 delves into the empirical strategy, followed by Section 6 which presents and discusses the results. Section 7 delves into possible extensions and concludes. References are listed in Section 8, and Section 9 encompasses the paper's tables and graphs.

2 Pension System in India: History and Background

The establishment of the Pension System in India traces its origins to the period post the Indian Independence Struggle in 1857, which prompted the British Government to initiate the provision of pensions for Indian personnel in the British Army. The Indian Pension Act of 1871 marked the inception of the pension framework, followed by the seminal Royal Commission on Civil Establishments that initiated pension payments in 1881. Subsequently, the Government of India Acts in 1919 and 1935 led to the expansion of pension policies across the public sector. This pension system continued post-independence in 1947, wherein both the Government of India (GOI) and all state governments extended pension benefits to their employees. This pension regime was predominantly a defined benefit structure, wherein employees did not contribute anything towards their pension during their active service years. Fundamentally, this design allocated the burden of pension payments to the annual revenue expenditure account of the GOI and the state governments. This pension scheme ensured a post-retirement monthly payment amounting to 50% of the final monthly salary before retirement of a public servant. Adjusted for inflation, these pension disbursements underwent increments every six months averaging at 3%.

The momentum towards pension reform gained impetus with the World Bank's 1994 Policy Research Report titled "Averting the Old Age Crisis." This report, which explained the importance of pension system restructuring, instigated the Indian Ministry of Personnel, Public Grievances, and Pensions of the Indian Government to establish an expert committee on June 25, 2001. Charged with reviewing the then present pension scheme and charting a course for a restructured pension system based on defined contributions, this committee marked a decisive step towards a reform. Concurrently, the Reserve Bank of India assembled a group to study the pension liabilities borne by state governments. The group's findings cast a spotlight on a startling revelation – collective state governments were distributing USD 5.97 billion (2001 USD) in 2001 in pension payments which were projected to escalate to USD 39.80 billion in 2010-11 (2001 USD). In terms of the aggregate state budgets, pension payments under the existing scheme were anticipated to burgeon to 33.8% of the total state expenditure in the country by 2010-11.

Responding to these findings, the Government of India initiated a paradigm shift, ushering in the National

Pension Scheme (NPS) overseen by the Pension Fund Regulatory and Development Authority (PFRDA) which operated under the purview of the finance ministry. Under this new regime, effective January 1, 2004, individuals entering central government employment after December 31, 2003, were mandatorily enrolled under the NPS. The NPS, which was a defined contribution framework, required employees to contribute 10% of their monthly income towards pension provisions which was matched by an equal government contribution. In April 2019, responding to employee protests, the Government's contribution was augmented to 14% of the employee's earnings. Upon retirement, NPS participants were eligible to withdraw up to 60% of the accumulated corpus as a lump sum, while the remaining 40% was channeled towards an annuity plan.

While the transition to the NPS ensured fiscal prudence, a significant legal statement emerged from the Supreme Court of India. The court articulated that "A retiree's pension stands as neither a benevolence nor a discretionary offering, but rather a compensation for the labor rendered by employees." The court viewed pension as an instrument of social welfare aimed at ensuring socio-economic justice for individuals whose careers were devoted to the employer with the implicit understanding of post-retirement security.

The NPS provides multiple portfolio managers, investment alternatives (active or passive), and four distinct asset classes – equity, corporate debt, government bonds, and alternative investment funds to choose from. Participants start by selecting a portfolio manager, which is followed by choosing an investment option. A pivotal distinction between the NPS and the previous Old Pension Scheme (OPS) pertains to predictability. While the OPS mandated pre-determined monthly pension disbursements, the NPS incorporates market-linked returns that introduce an element of unpredictability. Furthermore, the OPS featured the General Provident Fund (GPF), allowing government employees to channel a portion of their salaries into the fund, accompanied by tax incentives up to a stipulated contribution threshold. However, the advent of the NPS led to the termination of the GPF for NPS-covered individuals.

Post the central government's 2004 adoption of the NPS, most state governments across India embraced the NPS for their employees. Excluding West Bengal and Tamil Nadu, all states transitioned to the NPS over time. The adoption timeline of the NPS across states is depicted in Figure 1. However, the complex and uncertain nature of the NPS led to dissatisfaction among government employees which eventually culminated

in widespread protests. This dissent has translated into electoral agendas, with the restoration of the OPS becoming a focal point for political parties during state assembly elections. Notably, five states – Rajasthan, Chhattisgarh, Jharkhand, Punjab, and Himachal Pradesh – have signaled their intent to revert to the OPS, thereby introducing similar considerations among other states. Figure2 illustrates the current pension adoption patterns across Indian states. Given this backdrop, the pivotal question of the NPS's impact on public sector employees' consumption patterns, and the broader implications of pension wealth changes on household consumption is a question of paramount significance.

3 Related Literature

Since a lot of countries have modified their pension systems in the last few decades, the literature studying pensions is extremely rich. However, the outcome variable that is studied in the context of pension reforms is often household savings instead of consumption. Also, the literature often works with expected pension wealth, which can be interpreted as the present value of future benefits from the pension reforms.

Lachowska et all (2017) study the impact of Poland's 1999 pension reform on savings and expenditure. People who were over 50 at the time of the reform in Poland were exempt from the effects of this reform and permitted to continue using the pre-reform system, which had higher pension benefits as compared to individuals who at the time of the reform were 50 years of age or younger were to receive pension benefits calculated in accordance with a less generous post-reform pension formula. Therefore, the legislation significantly altered the expected public pension wealth among individuals of comparable ages, creating an environment akin to a natural experiment. The authors found that 1 Polish zloty (PLN) less of pension wealth increased household savings by 0.3 PLN. Zheng et all (2020), using a nationally representative dataset from the China Health and Retirement Longitudinal Study between 2011 and 2015, examine how pension participation and anticipated pension benefits affect the consumption of working-age people. They find that the consumption rate (total consumption to permanent income) of working-age adults covered by the employees' basic pension, a required public pension program for workers in the formal sector, is 29.9

percentage points higher than that of non-participants in any public pension program. Attanasio et all (2001) examine the connection between retirement savings and private discretionary savings using three significant pension reforms in the UK as natural experiments. According to their empirical research, the earnings-related pension tier has a detrimental effect on private savings, with substitution elasticities close to -1.0.

To assess the retirement reaction to real and imagined financial incentives, Chan et all (2003) integrate administrative and self-reported pension data and discover that when knowledge is neglected, people are five times more receptive to pension incentives than the ordinary person. Furthermore, rather than being indifferent to all incentives, uninformed people do react to their own misperceptions of the incentives.

In a 2016 study, Zhao et all (2016) use the China Health and Retirement Longitudinal Study (CHARLS) survey data from 2011 and 2013 revealing that people enrolled in public pension systems typically spend more within their respective income-quantile categories. They also find that lower-income categories for the retired population have a higher marginal propensity to consume than higher-income groups. In other words, lower-income groups are more likely than higher-income groups to spend a larger percentage of any rise in pension benefits on consumption.

Bottazzi et all (2004) use a decade of Italian pension reforms as a source of exogenous variation in projected pension wealth to quantify the impact of pension reforms on families' expectations of retirement outcomes and private wealth accumulation choices. Using the Survey of Household Income and Wealth, which happens to be a large random sample of the Italian population, the authors find that workers in Italy revised expectations in the direction suggested by the reform.

This paper advances the literature by conducting, to the best of my knowledge, the first empirical exploration into the effects of the Indian pension reforms on household consumption expenditure among the impacted public employee cohort. The prevailing discourse lacks robust empirical results to fall back on. This study serves as a contribution to the pension reform domain in particular, and the Indian public policy domain in general. Given the ongoing evolution of the Indian pension reform, empirical validation assumes paramount importance for its informed progression, a role this paper aims to fulfill.

4 Data & Descriptive Statistics

4.1 Data

The principal data source employed in this paper is the Employment and Unemployment Surveys (EUS) conducted as part of the Indian National Sample Survey (NSS). The NSS occupies a pioneering position among household sample surveys within the context of developing economies. Administered by the National Sample Survey Organization (NSSO), the apex data collection entity within India, these surveys have historically provided vital insights into the nation's socio-economic fabric. Notably, the NSSO operates under the watch of the Ministry of Statistics and Program Implementation, a department of the Government of India, since 1972. The NSSO conducts periodic sample surveys in the form of distinct rounds. Since 1973-74, the NSSO rounds have been split into two, the quinquennial (or "thick") rounds which were done at approximately five-year intervals on many households and the "thin" rounds which were conducted on a much smaller scale. Over its many rounds, the NSSO's coverage often fluctuates. But information on consumption and employment is always collected. The Employment and Unemployment Survey (EUS) conducted within the NSS, was, however, discontinued by governmental instructions post the 68th NSS round (2012) and replaced by the Periodic Labour Force Survey (PLFS). In the context of this study, data from the EUS rounds spanning the 50th (1994), 55th (2000), 61st (2005), 66th (2010), and 68th (2012) NSS rounds are stacked into a pooled cross-sectional data-set. This comprehensive data-set encompasses an array of attributes, encompassing monthly per-capita household expenditure, employment classification (public/private sector), weekly wages, educational attainment, gender, age, marital status, and duration of unemployment if applicable, alongside other information.

To understand the influence of pension wealth fluctuations on consumption, I construct a variable which I name Pension Wealth. It is to be noted that the estimation of pension wealth is confined to public sector employees due to the lack of information related to the savings scheme that private sector employees enroll themselves in. The construction of the pension wealth variable is carried out as follows. The initial step pertains to the calculation of the lifetime earnings trajectory for each household head who works in the

public sector. A pivotal parameter related to pension wealth calculation is life expectancy. While India's overall life expectancy at birth increased from 60 to 68 between 1994 and 2012, it is noteworthy that public sector personnel tend to register prolonged lifespans which can be attributed, at least in part, to the healthy work-life balance and enhanced job security characteristics of the Indian public sector. In this context, pension wealth estimation is modeled for all public workers with a life expectancy of 75 years. I account for the periodic salary increments and promotions when calculating lifetime earnings trajectory and pension payouts and proceed with the anticipated pension wealth at age 60 for the public sector personnel. The calculation of the present value of this pension wealth at age 60 is executed utilizing a conservative discount rate of 7%.

4.2 Descriptive Statistics

The summary statistics of the EUS data used in this paper are presented in Table 1. Notably, within the cohort of active labor participants, approximately 4% engage in public sector employment. The mean household size in the data stands at 6.23. Gender distribution showcases a division of 53% male and 47% female individuals within the dataset. The mean age, which is a pivotal demographic indicator, rests at 25.28 years. Highlighting educational attainment, a mere 6% of individuals possess a secondary education degree which is considered a milestone within India's 10+2 educational framework. A secondary degree is akin to having completed the 10th Grade in the US education system. The trajectory of average monthly per capita household expenditure over time is depicted in Figure 3, unraveling nuanced rural-urban sector dynamics. Scholarly investigations, as evidenced by Das and Pathak (2012) among others, have investigated the dynamics of India's increasing rural-urban disparities and contributed valuable insights on the topic.

The EUS data also provides the total weekly earnings of active labor participants. Extrapolating these earnings to a monthly scale unveils an average monthly household earning of 3257 INR during the period spanning 1994 to 2012. However, it's important to take into consideration the potential measurement inaccuracies that may crop up when calculating monthly earnings data which stems from possible errors arising when individuals, who receive monthly payments, convert their earnings inaccurately upon calculation

of their weekly wages.

5 Empirical Strategy

5.1 Consequences of the reform: identifying effects using difference-in-difference

I carry out my analysis of the 2004 Indian pension reforms by comparing the mean outcomes of the treatment and control groups by estimating a DID regression of the following form:

$$MPCE_{it} = \alpha + \lambda_t + \gamma \cdot Treatment\,Group_g + \beta \cdot Policy\,Offer_{gt} + \theta' \cdot X_{it} + \epsilon_{it} \quad (1)$$

where λ_t a set of time-fixed effects, $Treatment\,Group_g$ is a dummy variable which equals 1 for all the sub-19-year-old public sector employees who form the treatment group and 0 for all the sub-19-year-old private sector employees who constitute the control group. X_{it} denotes a set of covariates that includes sex, marital status, and education. My variable of interest in this equation is $Policy\,Offer_{gt}$, which represents a policy indicator that equals one for the sub-19-year-old government employees after the survey year 2000 in my data and zero otherwise. The reasoning for defining my treatment and control groups as described above is as follows:

Under the Indian pension reform, employees who joined the central government job after 31st December 2003 were instituted into the NPS. The central government employees of India are spread throughout the country, working in various states while being on the central government payroll. As is seen in a lot of other countries, public sector employees in India are constituted of both central and state government employees. While the EUS data covers information regarding the nature of the employer(government/private), it does not specify whether a government employee is a state or a central government employee. Another drawback of the EUS is that while it enquires about the nature of the employer, it does not enquire about the time spent in the current job. To know whether a public employee is a state or a central government employee and the year that a public employee joins the service are two important questions that are critical for the

correct specification of the treatment and control groups in my study.

Some states implemented the NPS right after the central government in 2004. The minimum age for joining a government job in India is 18 years. I use this information to identify people treated by the policy in our data in 2005 and beyond. I restrict the main analysis to working individuals who are less than 19 years of age in states that implemented the pension reform in 2004. The reason for doing so is any individual who is less than 19 years of age in 2005 and is a government employee in a state that followed the central government in adopting the pension reform in 2004 must be treated by the NPS. However, it is not possible to identify central government employees who are treated by the NPS in states that do not adopt the pension reform in 2004 in the 2005 EUS, the reason being that a government employee aged less than 19 in a state that has not adopted the NPS in 2004 may be a state government employee that would not be treated by the pension reform because of his or her state government not adopting the NPS yet. It is due to this very reason that in spite of the staggered nature of the policy implementation by the states, moving forward with the staggered DID is not an obvious choice and I adopt the canonical DID design for my study. Not dealing with a staggered design also allows proceeding without taking into consideration the decomposition issues brought forth by Goodman-Bacon(2021).

I proceed by restricting my sample to the states that implemented the pension reforms in 2004. For these states, the people aged less than 19 and in a government job in each survey year form our treatment group (treated by the pension reform) while the individuals aged less than 19 years and working in the private sector in each survey year form our control group. This empirical strategy, however, has the flip side of leading to a significant decline in the total number of treated people in our design. The 1994 and 2000 EUS form my pre-treatment period while all the latter surveys form the post-treatment periods. Given the following well-defined treatment and control groups, I proceed with the standard static DID model to investigate the causal relationship of the pension policy reform on the monthly household consumption expenditure (MPCE).

$$MPCE_{igt} = \alpha + \lambda_t + \gamma \cdot TreatmentGroup_g + \theta' \cdot X_{igt} + \sum_{T=-q}^{-1} \gamma_T \cdot PolicyOffer_{it} + \sum_{T=0}^{m} \xi_T \cdot PolicyOffer_{gt} + \epsilon_{it} \quad (2)$$

The necessary identification assumption or the parallel trends assumptions, hence, for our Difference-In-Difference model is that in the absence of the implementation of the NPS, the average difference in the MPCE of the households who have a member of the family that is less than 19 years of age and is working for the government to that of the MPCE of the households who have a member of the family that is less than 19 years of age and is working in the private sector would remain the same after controlling for covariates. In order to demonstrate that the parallel trend assumption holds, I use a dynamic event study plot that corresponds to equation (2). Similar to equation (1), equation (2) contains the same set of controls while q and m stand for the number of lags and leads of the treatment variable. Figure 4 shows the evolution of the mean MPCE of the public and private sector employees who are aged less than 19 years.

5.2 Consequences of the reform: estimating the degree of substitution between public pensions and private consumption

Although the Difference-in-Difference design in equation (1) gives us an estimate of the impact of the pension reform policy in terms of the Indian currency, it does not explicitly reveal the extent to which public pension money and private consumption are substituted. To specifically calculate the impact of changes in predicted pension wealth on consumption and to determine the degree of substitution in between them, we use an instrumental variable (IV) estimator. The model of interest now is:

$$MHE_{it} = \alpha + \lambda_t + \theta \cdot Pension\,Wealth_{it} + \beta \cdot Treated_{it} + \theta' \cdot X_{it} + \epsilon_{it} \quad (3)$$

where MHE is the monthly expenditure of household I in year t, PW is the expected pension wealth of the public service employee at the age of 60 and λ_t is a set of year-fixed effects, the variable $Treated_{it}$ is a dummy which is equal to 1 if the household head is a member of the cohort that is directly impacted by the reform and 0 otherwise, X_{it} is a vector of controls and $epsilon_{it}$ is an error term. The substitution

parameter, which measures the change in consumption in response to a change in public pension wealth is depicted by θ and is the coefficient of primary interest.

If PW and the error term are correlated, OLS estimates of Equation (3) will be biased. For instance, some people could have an unnoticed "taste for saving" that motivates them to increase their pension money and savings. If that is the case, the OLS estimator will be positively biased. Another important factor to consider is the possibility of a measurement error in pension wealth which may lead to the OLS estimator being attenuated and inaccurate.

I employ two institutional aspects of the 2004 pension reform to rectify these conceivable sources of bias. The expected level of PW had changed for certain households due to the pension reform, but not for others. Second, this change was solely based on the year a public sector employee joined the services. So I use the interaction term between (i) $Post\,Reform$, a dummy equal to 1 if the household head is observed in 2005 or later (0 otherwise), and (ii) $Treated$, the indicator of whether the household head belongs to a cohort directly affected by the reform, as already described as a valid instrumental variable for Pension Wealth, thereby leading to the first stage equation for the determination of pension wealth:

$$Pension\,Wealth_{it} = \alpha \cdot (Post\,Reform\,X\,Treated)_{it} + \lambda_t + \beta \cdot Treated_{it} + \theta' \cdot X_{it} + \epsilon_{it} \quad (4)$$

where the IV for PW is the interaction term Post-reform-Treated. This IV is unlikely to be associated with the error factor in Equation (4) because it varies solely as a result of the reform. The exclusion restriction is that the reform affected consumption only through its effect on Pension Wealth. In light of these presumptions, the estimate of θ_t represents the projected influence of pension wealth on consumption, which is determined by the variation in how the reform affects the treated and comparison groups.

6 Results

6.1

This section unveils the outcomes of the empirical analysis where I employ a static Difference-in-Differences (DID) model while supplementing the findings with event study graphs to fortify the research design's validity. Table 2 presents the findings of the static DID models. Commencing with Model 1—a baseline without covariates—it emerges that the pension reform policy induces a substantial decrease of 296 INR in household consumption for public sector employees. The result carries statistical significance at the 5% level but is accompanied by relatively high standard errors. Notably, the 95% confidence interval spans from a contraction of 40 INR to a more substantial reduction of 538 INR in monthly per capita household consumption due to the reforms. Extending the analysis to include covariates serves to augment both precision and robustness. Models 2 through 4 incorporate additional covariates without altering the fundamental outcome—a reduction of MPCE following the pension reform. This alignment across models showcases the policy's consistent impact. A model with log MPCE as the outcome variable, which is presented in Table 3, substantiates the regression results by estimating a sizable 27% decline in MPCE for the treated group due to the reform. However, akin to earlier findings, this estimate exhibits substantial standard errors which are characterized by a 95% confidence interval spanning from -18% to -64%. Figure 5, Figure 6, Figure 7, and Figure 8 illustrate the event study plots for the four static DID models introduced in Table 5. Remarkably, the inclusion of controls in the models, a measure aimed at enhancing precision, does not significantly alter the trajectory of the event study plots. This consistency reinforces the validity of the parallel trends assumption and acts as a robustness check for the DID methodology implemented.

6.2

The regression results for the IV model were used to estimate the impact on household consumption for every one-dollar change in pension wealth directed towards a 00.0033 INR increase in household consumption for every 1 INR increase in pension wealth as seen in Table 4. A 0.0033 INR increase in household consump-

tion for every 1 INR increase in pension wealth implicitly directs towards a 0.0033 INR decrease in household savings for every 1 INR increase in pension wealth. This is in line with the related literature, which usually points towards estimates ranging from 0 to -1 when estimating the impact of changes in pension wealth on savings. Table 5 depicts the results from the first stage of the IV regression. The F statistics for the first stage regression is 57.5721, which leads to a failure to accept the null hypothesis that our instrument is weak.

7 Discussion and Conclusion

In this study, I have examined the profound shifts in monthly per capita expenditure (MPCE) among Indian households impacted by India's pivotal 2004 pension reforms. The reform's introduction created a quasi-experimental setting which I use for the investigation of households' adjustments to private consumption patterns. The estimation results of the Difference-in-Differences (DID) framework in Table 2 reveal a tangible reduction in household consumption consequent to the reform which also implicitly signal a corresponding increase in private savings. The Instrumental Variable (IV) estimates, as displayed in Table 4, suggest that public pensions wield an incremental impact on private consumption, translating to approximately 0.0033 INR rise for each 1.0 INR escalation in pension wealth.

Decreased pension wealth is a possible governing dynamic that results in a decline in the Monthly Per Capita Expenditure (MPCE) among households impacted by the New Pension System (NPS). It is important to note that the NPS-covered employees' pension wealth is still a matter of prediction as the first cohort impacted by the reform is yet to retire. To assume that public sector employees under the NPS are adopting caution when forecasting their pension wealth is not too far-fetched despite the fact that market factors have the potential to drastically alter their pension wealth under the NPS.

The pension reforms have not led to any reports of early retirements among public sector employees, nor has there been a dip in the demand for public sector positions in India. This leads to the inference that public employees prefer adjustments in their consumption over labor supply changes in response to the reform. By categorizing the analysis of pension wealth's impact on consumption by age, previous studies indicate a

higher propensity for substitution within the 40 to 55-year age bracket and a lower substitution rate among younger cohorts (Attanasio and Rohwedder, 2003). Nonetheless, the observed substitution degree from the Indian pension reforms, while statistically significant and referring to a young cohort, is comparably modest in scale relative to the DID model's projections, warranting a more comprehensive investigation.

The importance of assumptions related to discount rates is inherent in the estimation of the substitution between pension wealth and private consumption. Hence, understanding discount rate values and their distribution across the population is crucial in order to provide insightful policy suggestions regarding the impact of the change on consumption dynamics. To conclude, this study sheds light on the relationship between India's 2004 pension reforms, pension wealth, and their relationship with household consumption behavior. The Indian pension reform, being an important yet relatively less studied topic warrants further exploration to understand its ramifications for public and private sector employees alike.

8 References

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9 Tables & Graphs

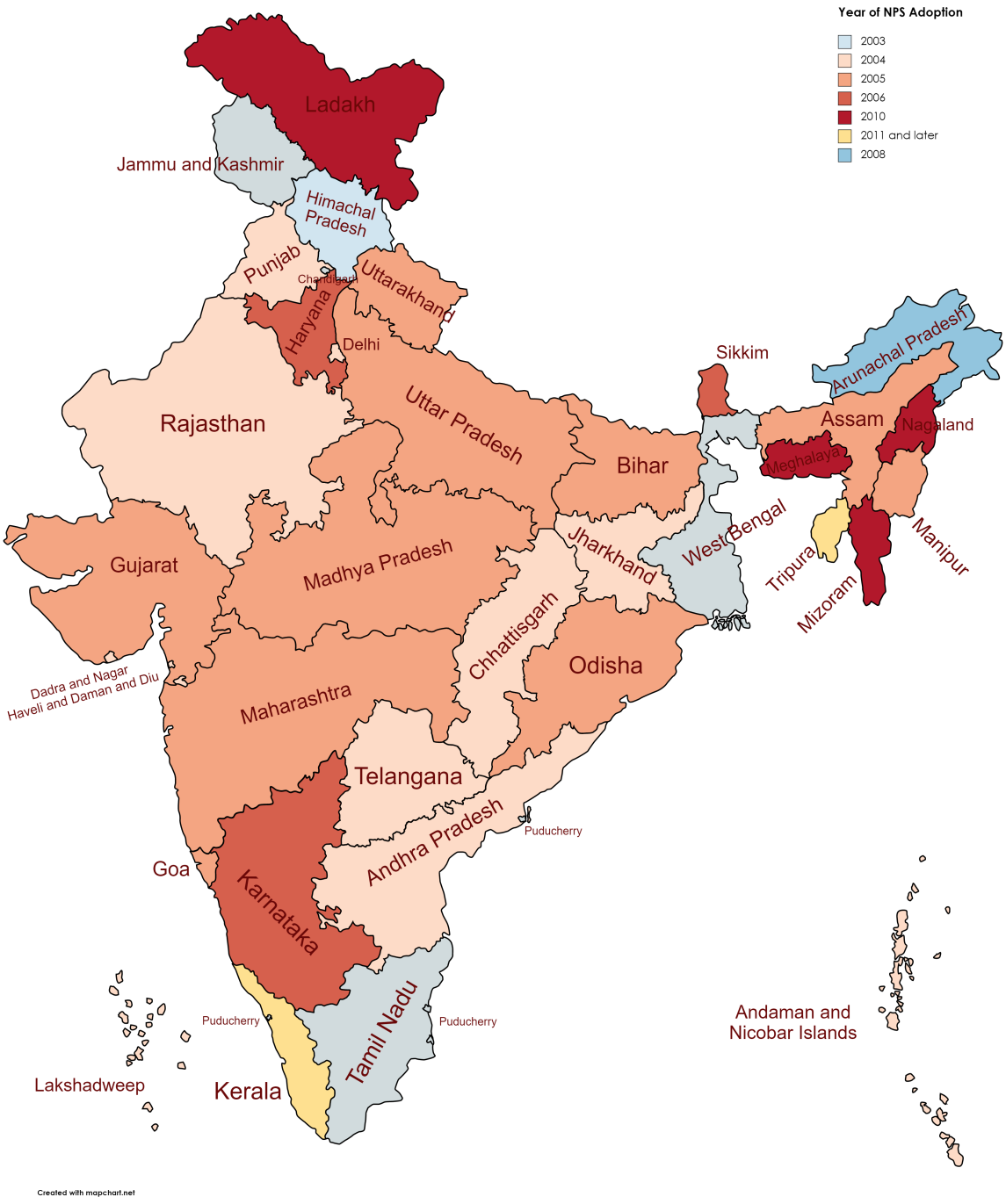

Figure 1: Timeline of NPS adoption by Indian states

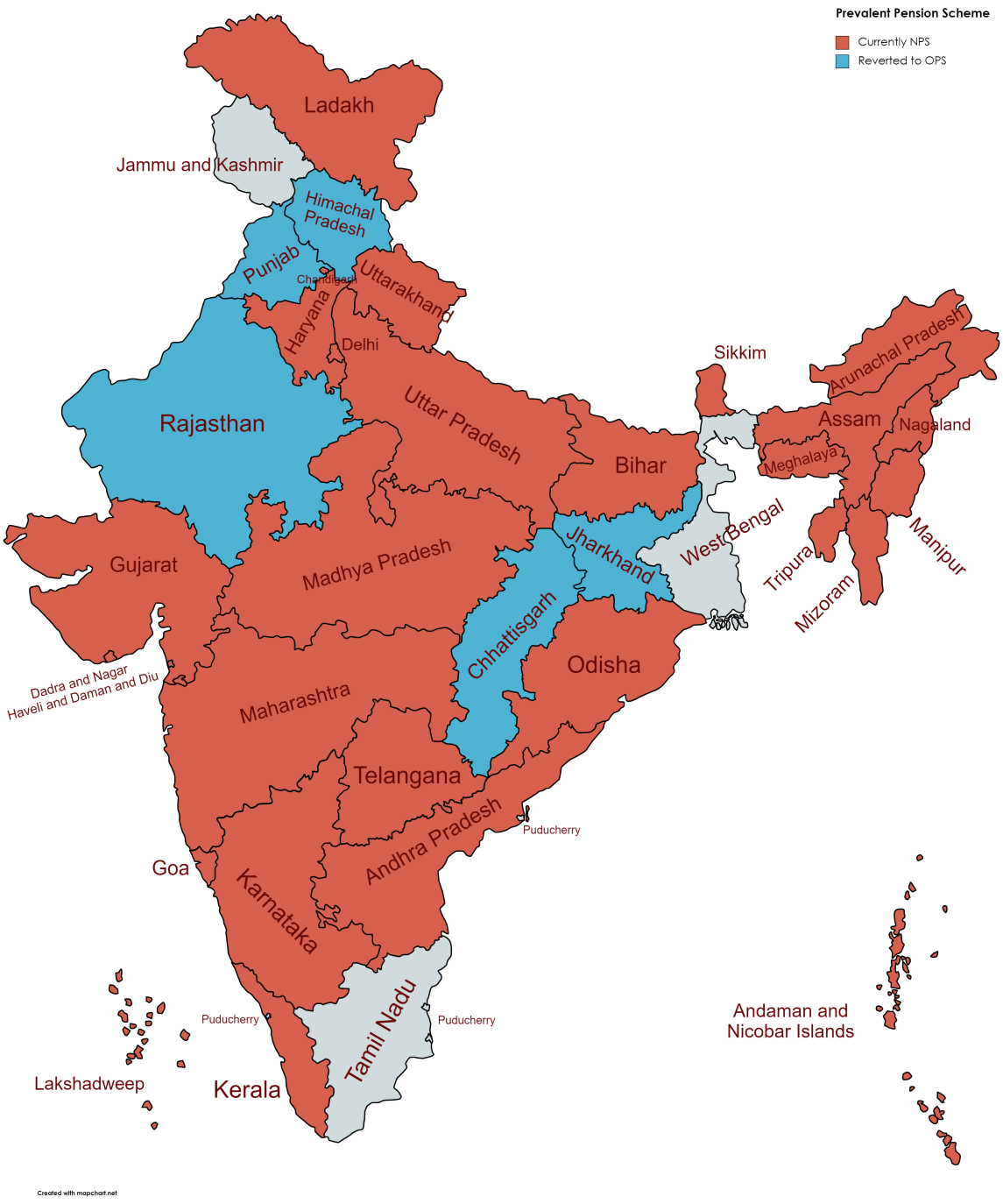

Figure 2: Prevalent Pension system

Variables	Mean	Std. Dev.
Government_Job	0.04	0.20
Household_size	6.23	3.14
Male	0.53	0.50
Age	25.28	17.64
Married	0.49	0.50
Secondary_Education	0.06	0.24
Monthly_Household_Income	3256.65	8313.52

Table 1: Summary Statistics

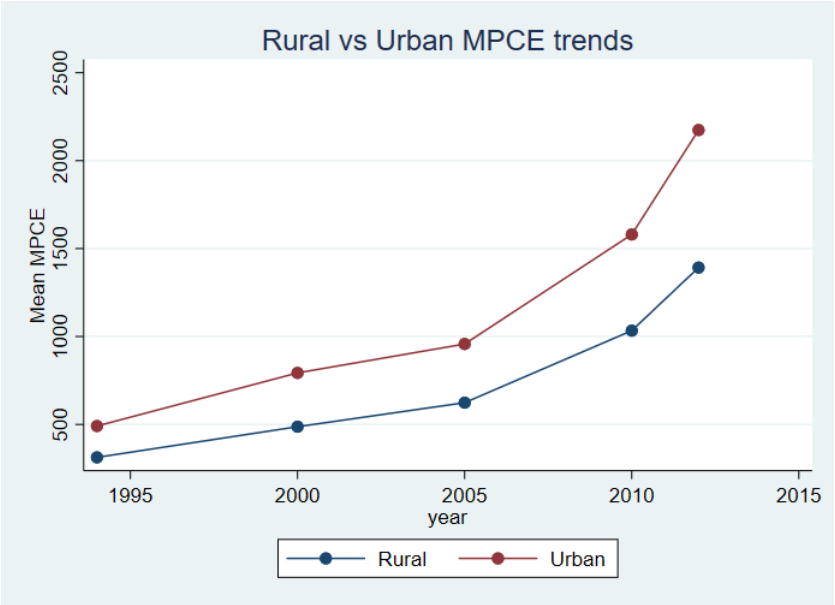

Figure 3: Mean MPCE Rural vs Urban plot

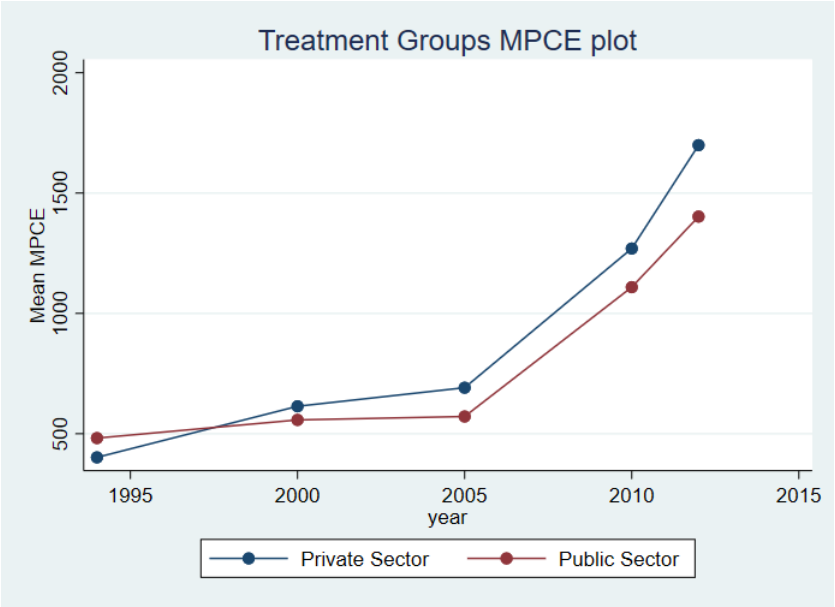

Figure 4: Mean MPCE Public vs Private sector employees with age less than 19 years plot

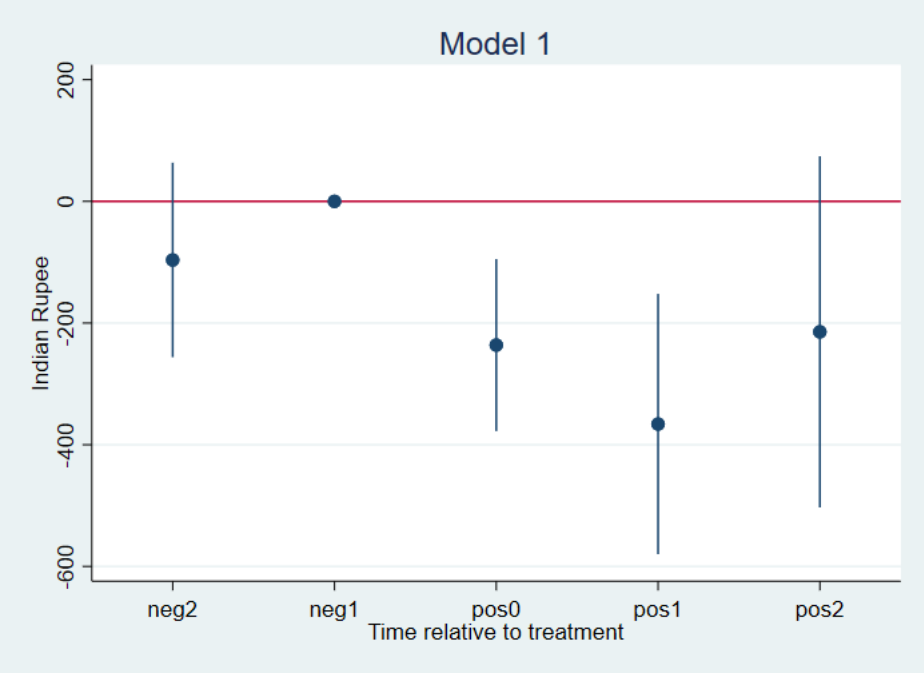

Figure 5: Event study plot with no controls

	(1)	(2)	(3)	(4)
	MPCE_household	MPCE_household	MPCE_household	MPCE_household
Treatment_Groups	168.3	152.4	152.6	153.6
	(0.115)	(0.164)	(0.164)	(0.160)
Policy_offer	-296.0*	-288.2*	-287.8*	-289.5*
	(0.017)	(0.023)	(0.024)	(0.023)
Sex		-47.37***	-46.61***	-46.42***
		(0.000)	(0.000)	(0.000)
Marital_Status			-22.40	-21.79
			(0.156)	(0.167)
Education				516.6***
				(0.000)
_cons	757.3***	827.0***	826.6***	824.8***
	(0.000)	(0.000)	(0.000)	(0.000)
Time FE	Yes	Yes	Yes	Yes
N	191270	191261	191176	191176
R^2	0.253	0.254	0.254	0.255

p-values in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: Static DID Results

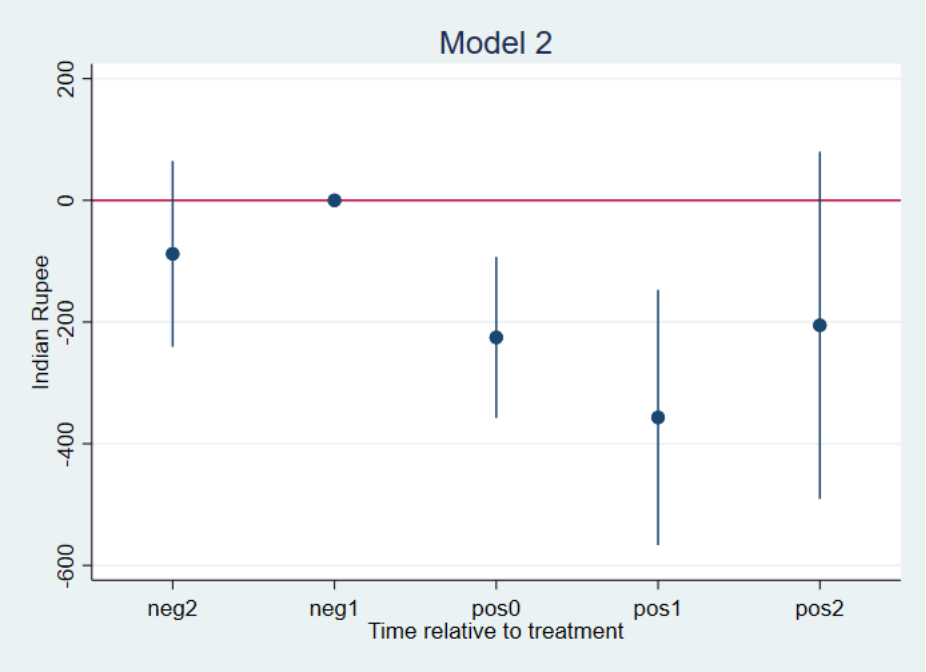

Figure 6: Event study plot when controlling for sex

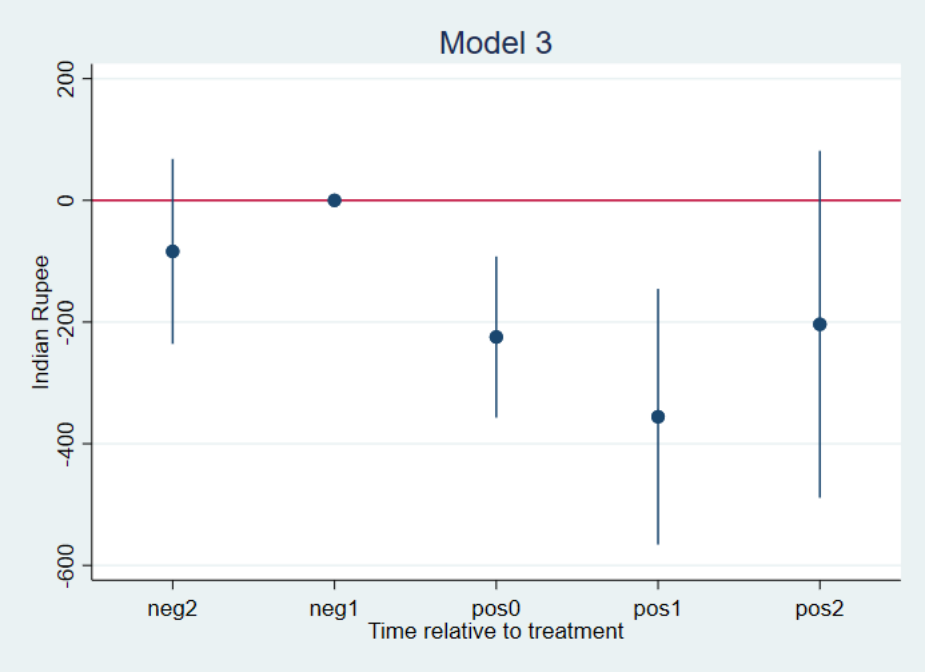

Figure 7: Event study plot when controlling for sex and marital status

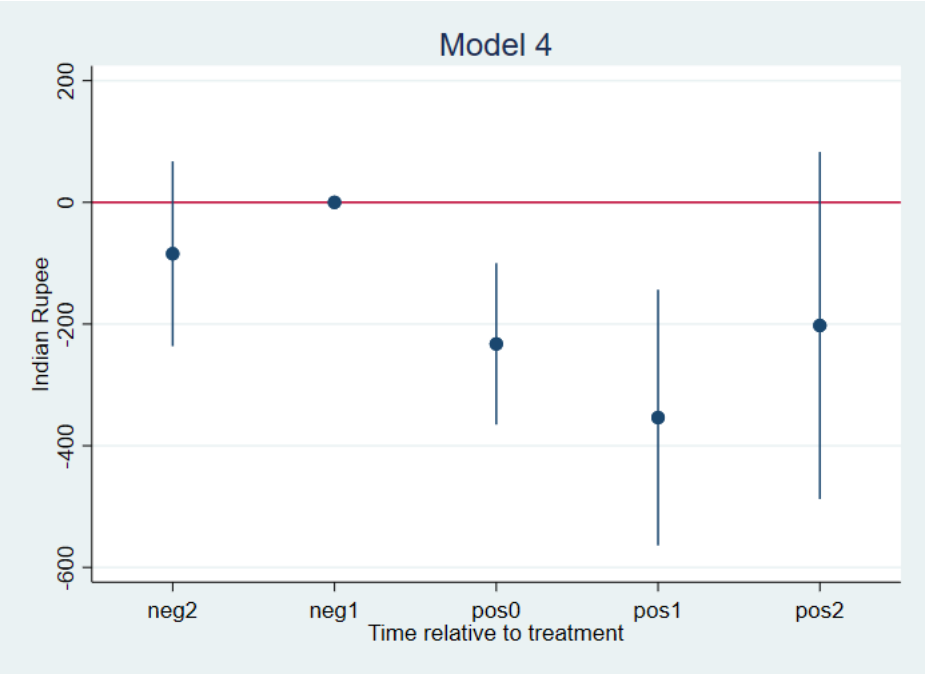

Figure 8: Event study plot when controlling for sex, marital status and education

	(1)
	log_MPCE
Treatment_Groups	0.359***
	[0.181,0.537]
Policy_offer	-0.271***
	[-0.649,-0.181]
Sex	-0.0461***
	[-0.0573,-0.0348]
Marital_status	-0.0107
	[-0.0440,0.0225]
Education	0.382***
	[0.222,0.541]
_cons	6.447***
	[6.407,6.486]
N	191186

95% confidence intervals in brackets

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Log MPCE regression results

	(1)	(2)
	total_Household_Expenditure(IV)	total_Household_Expenditure(OLS)
PW_at_60	0.00333***	0.00177***
	(29.83)	(27.22)
1994.year	0	0
	(.)	(.)
2000.year	172.3	894.8*
	(0.48)	(2.40)
2005.year	14.92	1480.1***
	(0.05)	(4.37)
2010.year	-12.56	3391.7***
	(-0.05)	(8.97)
2012.year	0	4863.6***
	(.)	(12.46)
ROC_Pension_Treatment	0	-4018.9***
	(.)	(-7.49)
_cons	1300.9***	2503.2***
	(3.92)	(9.78)
N	3242	3242

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: IV regression results

	(1)
	Pension_Wealth_at_60
year = 2000	695,815***
	(99,774)
year = 2005	1.042e+06***
	(90,968)
year = 2010	2.310e+06***
	(95,143)
year = 2012	3.243e+06***
	(90,675)
ROC_Pension_Treatment	1.847e+06***
	(304,182)
Post_Treat	-2.618e+06***
	(344,997)
Constant	561,195***
	(68,764)
Observations	3,242
R-squared	0.342

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: IV first stage results