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impacts government finances?**

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Farmers' Distress in India: Debt Waivers as a Policy Response and Their Implications

Sowmya Dhanaraj, Vidya Mahambare and Pragati

Abstract

Farm debt waivers which are meant to be a one-time settlement of loans have become common in India. We find that the timing of waiver announcements by state governments between 2001-02 and 2018-19 is associated with the timing of elections rather than agrarian distress reflected in droughts or farmer suicides. The waivers, unanticipated shocks to government expenditure, are associated with an increased revenue deficit, which is accommodated by a nearly 1/3rd cut in capital expenditure to control fiscal deficit within a stipulated norm. Given its path dependence, lower capital expenditure also reduces the quality of government spending in subsequent years.

Keywords: *debt waivers, agriculture policy, agriculture credit, welfare programs, electoral promises, state finances*

JEL Codes: *H53, H31, H81, Q18, Q14*

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INTRODUCTION

Indebtedness among farmers and their dependence on high-cost borrowings have long been recognised as the major problems contributing to agrarian distress in developing countries (Hoff and Stiglitz, 1990). Interventions in the credit markets such as government ownership of banks, subsidisation and selective allocation of credit, therefore, are common in these countries (Besley, 1994). India is no exception to such policy interventions and in recent years, farm debt forgiveness programs, locally known as farm debt waivers, have become a popular policy tool to alleviate farmers' financial distress.

Farmers' inability to repay farm debt has been associated with farmers' suicides (Sadanandan, 2014; Merriott, 2016). In 2019, 16,238 people working in the agriculture sector: farmers and farm labourers took their own lives, amounting to 7.4 percent of total suicides in India (Accidental Deaths and Suicides in India (ADSI, 2020). Farmers' financial distress has also been linked to nearly an eight-fold increase in farmers' protests between 2014 and 2018 (Himanshu, 2018). Given this scenario, the central and state governments of India have increasingly resorted to farm debt waiver schemes which have a long history that dates back to the 14th century (Rath, 2019). In independent India, Haryana state announced the first debt waiver in 1987 (Phadnis and Goswamy, 2019; Naryanan and Mehrotra, 2019) while the state of Karnataka has announced farm debt waivers for the highest number of times. The central government of India has announced two all India farm debt waivers, namely Agricultural and Rural Debt Relief Scheme (ARDRS), 1990 and Agricultural Debt Waiver and Debt Relief Scheme (ADWDRS), 2008. In total, fifteen such farm debt waiver programs were announced by the Indian states between 2014 and 2019.

Studies such as Raj and Edwin (2018) and Giné and Kanz (2017) among others, analyse the impact of specific farm debt waiver episodes on farmers' welfare, farm incomes and employment, and rural credit

markets, while Phadnis and Goswamy (2019) and Narayanan and Mehrotra (2019) review the growing empirical literature in this area along with the descriptive analysis of the debt waiver schemes. To the best of our knowledge, there is no study that 1) statistically explores the determinants behind the timings of debt waiver announcements and 2) studies their effects on state finances in terms of their impact on the budget deficit and its components such as capital expenditure by states. This study focusing on farm debt waiver schemes announced by state governments in India between 2001-02 and 2018-19 provides empirical evidence on both these dimensions.

Our analysis of a pooled as well as fixed effects logistic regression model using panel data of Indian states from 2001-02 to 2018-19 reveals the policymakers' likely motivation behind the debt waiver announcements. The results show that the majority of debt waiver announcements are timed within a year or two of upcoming elections and are not associated with the indicators of agrarian distress such as drought occurrences, the severity of droughts, farmers' suicides or performance of agriculture in terms of GSDP growth. The results are robust to different specifications as well as estimation methods.

Given that agricultural debt waivers are mostly unanticipated expenditures, they may have ramifications on state finances and other expenditures of the state. We employ dynamic panel models to study the effect of waiver schemes on different indicators of state finances and use generalized method of moments (GMM) estimation method to correct for the potential endogeneity issues. Our results indicate that while debt waivers are associated with increased revenue deficit, but they had no bearing on the gross fiscal deficit. This is possibly due to the requirement for the state governments under the Fiscal Responsibility and Budget Management (FRBM) Act, 2005 to maintain the gross fiscal deficit to GDP ratio to 3 percent of the state GDP. We find that the farm debt waiver schemes have been accommodated by one-third cut in the capital outlay on an average, especially a reduction in developmental spending during

the years of the waiver announcement. Our estimates have a potential under-estimation bias since the state governments spread the expenditures incurred on debt waivers over 2-3 years after the waiver announcements are made.

The rest of the paper is organised as follows. In the following section, we provide a brief description of types of waiver schemes announced by states and review the existing literature on the impact of debt waivers on the behaviour of lenders and borrowers. Following this, we discuss evidence on the determinants of the timing of debt waiver announcements, specifically the role of droughts, farmers' suicides, and the state elections and then investigate empirically the impact of the debt forgiveness schemes on state finance and productive expenditure. Finally, we discuss policy implications and limitations of the study while the last section provides the concluding observations.

DETAILS OF THE FARM DEBT WAIVER SCHEMES AND THEIR IMPACT

Farm debt waiver schemes in India differ substantially in terms of structure and target groups – 1) some schemes only waive off interest/penal interest, while others waive off the principal as well; 2) some schemes only waive off loans taken from specific group of banks while others cover all formal lending institutions; 3) some schemes waive off loans taken by small and marginal farmers while others cover all farmers (Table 1). Further, the loan waiver schemes put restrictions by capping the amount of waiver provided per farmer. The farm debt waivers as a percentage of the respective Gross State Domestic Product (GSDP) have been in the range of 0.1-1.9 percent (RBI, 2018). Despite the government's efforts to increase access to formal finance through expansion of formal institutions, reliance on non-institutional sources of credit remains high at around 40 percent (NABARD, 2018), especially among marginal and small farmers (Kumar et al 2017, RBI, 2019); however, farm debt waivers cover the formal sector debt only.

**Table 1: Features of Loan Waiver Schemes Announced
between 2001-02 and 2018-19**

State	Waiver Policy Announcement (Month and Year)	Amount of Waiver (INR Billion)	Institutions	Limit per farmer	Farmer Category	Type of debt waived
Tamil Nadu	Jul 2006	68.66	Co-operative banks/ societies	No Limit	All Farmers	All agricultural loans
Karnataka	May 2007	15.05	Co-operative banks/ societies	Waiver of short term crop loans upto INR 25,000 (at the time of loan sanction); for short term, medium term and long term loans of more than INR 25,000 interest waiver if principal paid within Mar 31, 2007	All Farmers	Short term crop loans
Central Government	Feb 2008	522.6	SCBs, Local area banks, Co-operative Credit Institutions (Urban and Rural), RRBs	No limit on waiver of Small and Marginal Farmers; Other Farmers 25 percent rebate on payment of 75 percent balance	All Farmers	Direct Agriculture Loans (short-term and investment loans)
Karnataka	Jul 2012	35	Co-operative banks/ societies	Upto INR 25,000	All Farmers	All Crop loans
Uttar Pradesh	Nov 2011	16.5	RRBs and Land Mortgage Banks	Loan value not greater than INR 50,000 at the time of sanction and borrower should have repaid atleast 10 percent of the borrowed amount before Mar 31, 2012	All Farmers	All loans having agricultural land as collateral

(Contd...Table 1)

State	Waiver Policy Announcement (Month and Year)	Amount of Waiver (INR Billion)	Institutions	Limit per farmer	Farmer Category	Type of debt waived
Andhra Pradesh	Aug 2014	240	SCBs, RRBs, Rural Co-operative Credit Institutions	Upto INR 150,000; only one loan per farmer	All Farmers	Short term crop loans including those issued against gold and those converted to Medium term (MT) loans due to calamities
Telengana	Aug 2014	170	SCBs, RRBs, Rural Co-operative Credit Institutions (including UCBs)	Upto INR 100,000; only one loan per farmer	All Farmers	Short term crop loans including those issued against gold and those converted to Medium term (MT) loans due to calamities
Tamil Nadu	May 2016	57.8	Rural Co-operative credit institutions excluding UCBs	No Limit	Small and Marginal Farmers	All agricultural loans
Uttar Pradesh	Apr 2017	363.59	SCBs, RRBs, Co-operative credit societies/banks excluding UCBs	Upto INR 100,000; all Non-Performing Asset (NPA) loans of small and marginal farmers upto INR 100,000 per farmer	Small and Marginal Farmers	Crop loans including those converted to MT loans due to calamities but excluding loans given by self help group or joint liability group

(Contd...Table 1)

State	Waiver Policy Announcement (Month and Year)	Amount of Waiver (INR Billion)	Institutions	Limit per farmer	Farmer Category	Type of debt waived
Jammu and Kashmir	Jan 2017	2.447	Kisan Credit Card (KCC)	KCC loans upto INR 100,000 given 50 percent waiver	All Farmers	Kisan Credit Card (KCC) Loans
Punjab	Oct 2017	100	Co-operative Credit institutions (including UCBS); public sector banks and private sector banks	Upto INR 200,000 for crop loans of small and marginal farmers; flat rate of INR 200,000 for other loans taken by marginal farmers	Small and Marginal Farmers	Crop Loans
Maharashtra	Jun 2017	340.22	SCBs, RRBS, Grameen Banks, DCCBs	Upto INR 150,000; incentive upto INR 25,000 for farmers who paid their loans by Jul 31, 2017	Small and Marginal Farmers	Crop Loans and term Loans
Karnataka	Jun 2017	81.67	Rural Co-operative institutions	Upto INR 50,000; only one loan per farmer	All Farmers	Crop Loans
Rajasthan	Feb 2018	80	Rural Co-operative institutions and primary land development banks	Upto INR 50,000 for small and marginal farmers; for other farmers loan waiver need to be worked out on proportionate basis linked to the prescribed land holding of small farmers (2 hectare), subject to the limit of INR 50,000	Small and Marginal Farmers; Other Farmers	Crop Loans

(Contd...Table 1)

State	Waiver Policy Announcement (Month and Year)	Amount of Waiver (INR Billion)	Institutions	Limit per farmer	Farmer Category	Type of debt waived
Rajasthan	Dec 2018	180	Central Cooperative Banks, SCBs, RRBs, Nationalised Banks	All short-term loans from CCBs; upto INR 200,000 from SCBs, RRBs, Nationalised Banks	All Farmers	Short term Loans
Karnataka	Jul 2018	340	SCBs, RRBs, Co-operative credit societies/banks excluding UCBs	Upto INR 200,000 for overdue loans from SCBs; upto INR 100,000 for overdue loans from co-operatives	All Farmers	Crop Loans
Madhya Pradesh	Dec 2018	360	SCBs, RRBs, Co-operative Banks	INR 200,000	All Farmers	Crop Loans
Chhattisgarh	Dec 2018	61	SCBs, RRBs, Co-operative Banks	INR 200,000	All Farmers	Crop Loans
Assam	Dec 2018	6	KCC loans from PSBs	25 percent of farm debt upto INR 25,000	All Farmers	KCC loans taken via public sector banks

Source: Authors' compilation.

Note: Detailed table of loan waiver along with sources is presented in Appendix (A2).

The existing literature on the impact of agricultural debt waiver programs in India focuses on its effects on the rural credit market- the repayment behaviour of borrowers, lending behaviour of banks (supply side of credit), borrowings by farmers (demand side of credit), and on how beneficiary farmers' consumption, investment and saving pattern change post debt waiver. Studies show that farm debt waivers disincentivise farmers to pay their loans on time leading to a moral hazard problem (Shylendra, 1995; Giné and Kanz, 2017; Mukherjee

et. al., 2018). Some studies also document credit rationing post farm debt waivers with banks becoming more cautious in their lending fearing non-repayment by the borrowers, resulting in lower access to credit to debt waiver beneficiaries (Kanz, 2016; Mukherjee *et. al.*, 2018), and a reallocation of credit away from districts with high debt waiver exposure (Gine and Kanz (2017). Kanz (2016) analysing the all India debt waiver of 2008 suggests that agricultural investment and productivity over two post debt waiver crop seasons declined for the beneficiaries of debt waiver. Also, Kanz (2016) and Pande (2019) suggest that farmers perceive the debt waiver as a temporary change in their income and do not increase their consumption levels post-waiver, in line with Friedman's permanent income hypothesis (1957). In terms of likely determinants of farm debt waiver announcements, Phadnis and Goswamy, (2019) suggest that the waivers are a part of the fulfilment of an electoral promise while Narayanan and Mehrotra 2019) argue that the waivers depend on the severity of drought. However, there has been no empirical investigation of factors related to the timing of debt waiver announcements as well as their impact on state finance.

WHAT EXPLAINS THE TIMING OF THE DEBT FORGIVENESS SCHEMES?

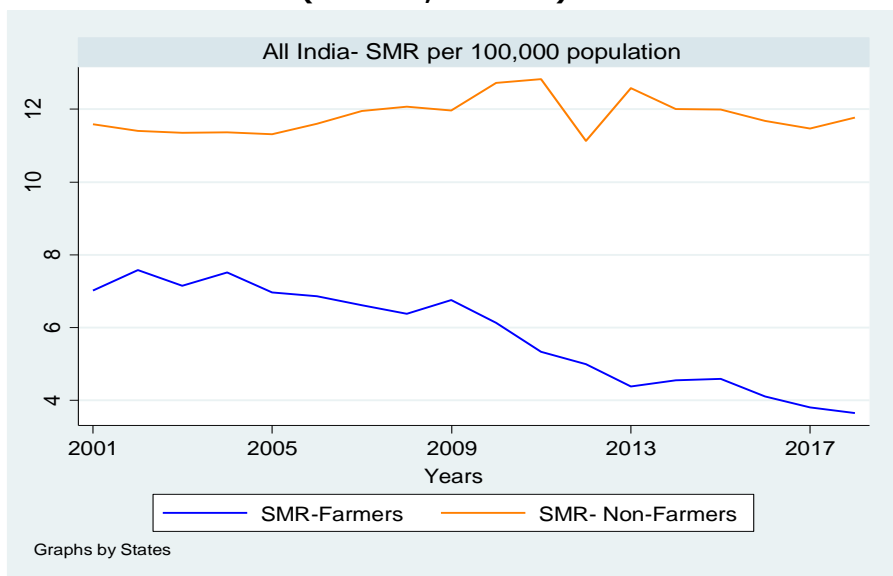
Farmers' Indebtedness and Suicides

The farm debt waivers are often justified on the ground that distress caused by an inability to repay farm debt is a major cause for farmers' suicides (Jeromi, 2007; Mitra and Shroff, 2007; Sadanandan, 2014; Merriott, 2016). In around 48 per cent of the cases farmers' suicides, bankruptcy or indebtedness, was listed as a reason in 2018 (ADSI, 2020). The suicide mortality rate (SMR)¹ of farmers, defined as deaths due to suicides per 100,000 farmers has declined by more than half from nearly 8 in 2002 to less than 4 in 2018 (Figure 1) while SMR among the rest of

¹ SMR is calculated as number of suicides per 1 lakh population of farmers in the state. The source of data for suicides and farmer populations are detailed in Appendix table A2.

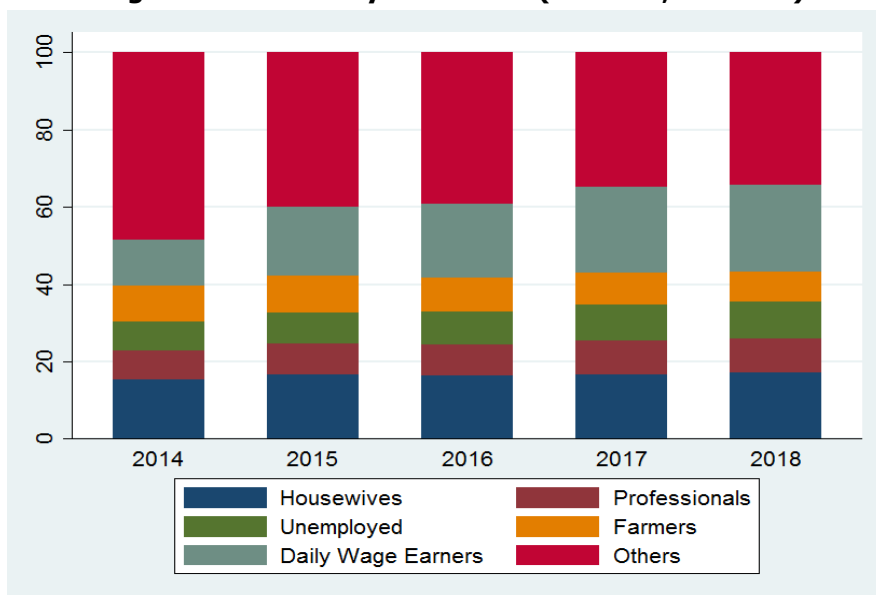
the population remains high. While farmer suicides are normally discussed as a broader category, it includes suicides of agricultural labourers who are hired as farm workers and are not entitled to any debt forgiveness schemes. While farmers' SMR has declined in recent years corresponding to the debt waiver period, SMR among the population excluding farmers has been higher than SMR of farmers since the start of the period (except for the states of Chhattisgarh Kerala, Maharashtra and Punjab for certain years). Among the occupational categories, suicides by daily wage earners and unemployed have seen the sharpest rise (Figure 2).

Figure 1: Suicide Mortality Rate of Farmers and Non-Farmers (All India, 2001-18)



Source: Authors' compilation based on NCRB data.

Figure 2: Suicides by Profession (All India, 2014-18)



Source: Authors' compilation based on NCRB data.

Note: Due to lack of uniformity in data for suicides by professions for earlier years, only data from 2014-18 are reported.

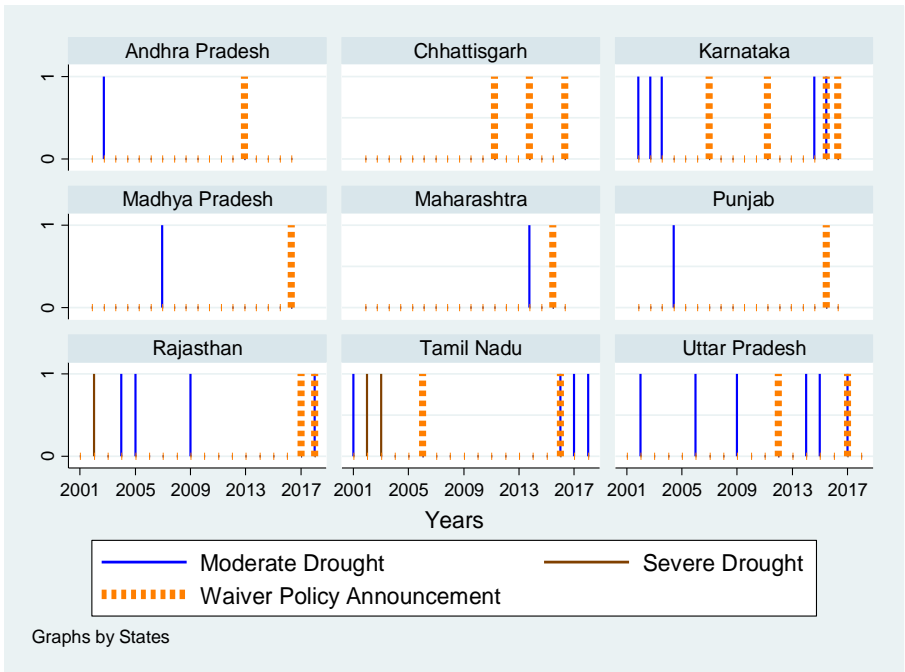
Occurrence of Droughts

Droughts in India usually extend over large spatial scales across the country and exerts a significant impact on agricultural activities (Majumdar, 2020). Pandey and Bhandari (2009) have shown that small farmers fall back into poverty during drought years while Parida *et. al.*, (2018) using more than half a century of data find that drought significantly increases farmer suicides. While some recent farm debt waivers appear to coincide with the instances of drought in the states, the relationship does not appear to be strong (Figure 3).²³

² In contrast, other climate extreme events such as cyclonic storms and floods tend to be localised and as a result, the policymakers do not tend to announce state-wide loan waiver programs. It is for the above reasons that we do not include floods and cyclones in our analysis.

³ As per the meteorological definition (GoI, 2009), a drought is officially declared in an Indian state if rainfall is 11 percent to 25 percent less than the Long Period Average (LPA) rainfall between

Figure 3: Type of Drought Experienced and Farm Debt Waiver Announcement



Source: Authors’ compilation based on various sources.

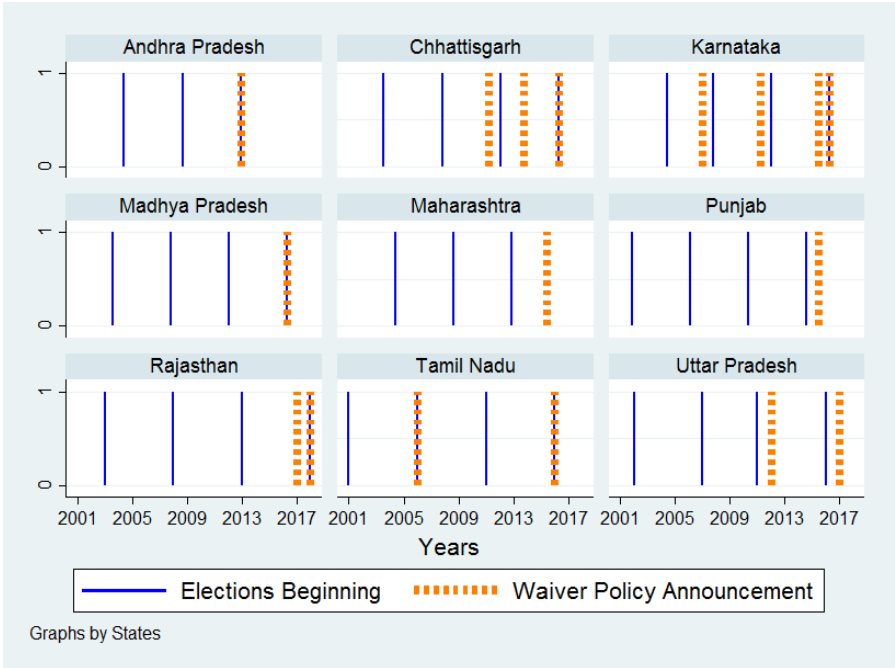
Note: Andhra Pradesh includes the erstwhile state of Telangana.

State Elections

Phadnis and Goswamy (2019) suggest that debt waivers are decisions taken by political leaders across the political parties of different ideologies and are strategically timed to coincide with the electoral calendar. In line with their findings, Figure 4 suggests that there is a proximity between elections and loan waiver announcements with most of the waivers announced in and around the elections possibly to woo the voters or fulfilment of the poll promise post the elections.

1950 and 2000. A moderate drought is defined if rainfall is between -26 to -50 percent than the LPA and a severe case if rainfall is less than -50 percent than the LPA.

Figure 4: Relationship Between Elections and Farm Debt Waiver Announcements



Source: Authors' compilation based on various sources.

Note: Andhra Pradesh includes the erstwhile state of Telangana.

To conclusively investigate the motivation behind the announcements of farm debt waivers listed in Table 1 (excluding the 2008 central government waiver), we empirically test the following hypotheses:

Hypothesis 1A: *Farm debt waiver announcements are motivated by farmers' financial distress as captured by droughts, suicide mortality rates or a fall in real agricultural GDP growth.*

Hypothesis 1B: *Farm debt waiver announcements are motivated by electoral exigencies as captured by elections scheduled in the announcement year or the upcoming year.*

Timing of Announcements of Debt Waiver Schemes: Results of Panel Logistic Regression Analysis

We use panel data for 16 major non-special category states⁴ from 2001-02 to 2018-19 to study the timing of the waivers using the pooled effects model in (1):

$$Pr(y_{it} = 1|x_{it}) = G(x_{it}^T\beta + \lambda_t) \quad (1)$$

where i represents the states and t refers to the time period, λ_t represents the time fixed effects that capture the common shocks across the states in a specific time period. The dependent variable y_{it} in the model is a binary, which takes the value of 1 if the state i has announced a farm debt waiver in the financial year t and 0 otherwise.⁵

We consider the farm loan waivers in which the principal amount of loan (in part or full) had been written off and as independent variables, we consider the factors which reflect farmers' distress in a particular year (Table 2): suicide mortality rate (SMR) of farmers, occurrences of drought, real gross state domestic product (GSDP) growth in agriculture, which is a proxy to capture real income growth of farmers, and political factors, namely the state electoral cycle. Higher SMR of farmers may reflect the worsening farm distress and hence may lead to a state announcing a debt waiver to alleviate the distress. To capture the effect of droughts on the likelihood of announcing a waiver scheme, we use a variable denoting whether the state faced a moderate or severe drought in the year t as well as whether there were two consecutive

⁴ The 'special category' states and smaller states in India receive a preferential treatment in the form of tax breaks and assistance to manage state budgets from the central government, which may influence their decisions about farm debt waivers compared to the other states. Therefore, only non-special category states have been included in the analysis. Data pertaining to the state of Andhra Pradesh includes the newly formed state of Telangana from 2014-15 to 2018-19.

⁵ There are some states that have not announced waivers during the period of analysis of the study. The rationale behind the inclusion of states other than those that have announced a farm debt waiver is to eliminate the bias caused by taking just the waiver states in our sample.

droughts (t and $t - 1$) in different models. To investigate if political parties announce debt waivers for electoral gains, we use a dummy variable for state elections, which takes value 1 if a state i goes to elections in year t , the same year as of the debt waiver announcement and 0 otherwise, and another dummy variable if state elections were scheduled in the upcoming year that indicates if the election is scheduled in the next financial year ($t + 1$) of the debt waiver announcement (Table 2).

Table 2: Variable Definitions and Sources

Variables	Definition	Sources
Loan waiver announcements	Debt waiver of state governments in which some or full principal of farm loan is waived	Mehrotra and Narayanan (2019); Budget Documents of various state government; PIB for farm loan waivers from Aug 2014 to Jan 2018 and other sources
Suicide Mortality Rate (Farmers)	Number of farmers suicides per 1,00,000 farmers including farm labourers	Number of Farmers suicides - NCRB: Accidental Deaths and Suicides in India Total Farmer Population - 'Agricultural Statistics at a Glance', Directorate of Economics and Statistics, Ministry of Agriculture and Farmers Welfare, Govt. of India (calculated by interpolating/extrapolating population figures of main and marginal cultivators between 2001-2018 from census data of 2001, 2011)

(Contd.. Table 2)

Variables	Definition	Sources
Date of elections	Scheduled state government elections	Collated from various state government's website
Excess rainfall year	(i) Excess rainfall-actual rainfall is 20 percent to 59 percent more than Normal Rainfall (ii) Large excess rainfall- actual rainfall is \geq 60 percent more than Normal Rainfall	Normal Rainfall Data (average rainfall from 1950-2000) – data.gov.in Actual Rainfall data – Water Resources Information System (WRIS)
Drought year	(i) Normal drought-actual rainfall is 11 percent to 25 percent less than Normal Rainfall (ii) Moderate drought-actual rainfall is 26 percent to 50 percent less than Normal Rainfall (iii) Severe drought-actual rainfall is less by 50 percent or more than Normal Rainfall	Normal Rainfall Data (average rainfall from 1950-2000) – data.gov.in Actual Rainfall data – Water Resources Information System (WRIS)
Growth in yield	Annual growth in total food grains yield (kg per hectare of land)	Ministry of Agriculture and Farmers' Welfare, Govt. of India
Real agricultural GSDP growth rate	Annual growth by agriculture GSDP at constant prices (the base year 2004-05 prices)	Handbook of Statistics on Indian States, RBI

Source: Authors' compilation

The results of the pooled effects logistic regression indicate that the election in the current year as well as in the upcoming year is associated with an increase in the odds of debt waiver announcements by 6 and 8 times respectively (Table 3). None of the variables that capture the distress of farmers such as drought or suicide mortality rates has any effect on waiver announcements by state governments. Overall, the results indicate that the timing of farm debt waiver announcements has more to do with political factors than the factors related to farm distress.

Table 3: Factors Affecting the Announcement of Farm Debt Waiver (Time period 2001-02 to 2018-19)

Variables	(1)		(2)	
	odds ratio	Se	odds ratio	se
Elections in the upcoming year	6.051**	(5.240)	6.070**	(5.281)
Elections in the current year	8.344**	(7.053)	8.449**	(7.055)
Suicide mortality rate	1.010	(0.024)	1.013	(0.025)
Growth of agricultural GSDP	0.988	(0.039)	0.991	(0.040)
Moderate or severe drought year	1.128	(0.851)		
Drought for two consecutive years			0.769	(0.656)
Constant	0.317	(0.228)	0.344	(0.249)
Time fixed effects	Yes		Yes	
Observations	106		106	
Number of states	16		16	

Source: Authors' compilation based on the model results.

Note: *** p<0.01, ** p<0.05, * p<0.1. Robust standard errors in parentheses

The robustness of the model was tested using other independent variables including the state's real per capita income (Col (1) in Table 4), agricultural yield (Col (2) in Table 4), and growth in yield (Col (3) in Table 4). Despite the inclusion of other explanatory variables, the coefficients on elections remain statistically significant. The results are also robust to alternative specifications that include the independent variables such as agricultural GSDP growth in real terms, drought and suicide mortality rates in their lagged form to account for the possibility of time lag in the realization of agricultural distress and announcement of farm debt waiver (Col (4) in Table 4). Further, to check that the results are not biased by unobserved time-invariant factors, we also use state fixed effects in the model (Col (5) in Table 4). The results also remain robust to the random effects logistic model (Table A1 in the Appendix).

Table 4: Robustness Checks

Variables	(1)	(2)	(3)	(4)	(5)
Elections in the upcoming year	6.406** (6.064)	4.067* (3.439)	5.144* (4.680)	6.969* (7.486)	1.795 (2.517)
Elections in the current year	8.196** (6.803)	9.072*** (7.411)	7.749*** (6.143)	9.823** (9.922)	102.149** (221.901)
Suicide mortality rate	1.003 (0.026)	1.011 (0.027)	1.013 (0.024)		1.098 (0.190)
Growth of agricultural GSDP	0.989 (0.038)	1.003 (0.032)	1.011 (0.045)		0.976 (0.043)
Moderate or severe drought year	1.067 (0.864)	1.308 (1.090)	1.322 (1.009)		2.201 (3.269)
ln(per capita real NSDP)	1.519 (1.196)				
Agricultural yield (kg/hectare)		0.999 (0.001)			
Growth in yield (percent)			0.983 (0.017)		
Suicide mortality rate (t-1)				1.020 (0.022)	
Growth of agricultural GSDP (t-1)				0.971 (0.029)	
Moderate or severe drought (t-1)				0.113* (0.134)	
Constant	0.004 (0.032)	2.358 (3.370)	0.338 (0.261)	0.393 (0.334)	
Time fixed effects	Yes	Yes	Yes	Yes	Yes
State fixed effects					Yes
Observations	106	106	106	106	119
Number of states	16	16	16	16	7

Source: Authors' compilation based on the model results

Note: *** p<0.01, ** p<0.05, * p<0.1, robust standard errors in parentheses

IMPACT OF FARM DEBT WAIVERS ON PUBLIC FINANCES

We now explore the impact of waiver announcements on state finances, specifically on the revenue deficit, fiscal deficit, capital outlay and its composition, especially developmental capital spending by the states. Agricultural debt waivers, unless they are pre-planned result in an unanticipated shock to government expenditure since debt waivers involve large transfers from the government to the lending institutions to clear up their balance sheet. This in turn raises the revenue expenditure of the states and consequently, their revenue deficits given the revenue receipts. However, this increase in revenue deficit may not be reflected in fiscal deficit given the FRBM act, enacted by the central government in the Fiscal Year (FY) 2003-04 and by most of the state governments in the FY 2005-06 that requires the states to contain the fiscal deficit to GSDP ratio at 3 percent as (Chakraborty and Dash, 2017). Further, RBI (2020) the Indian state governments tend to treat capital outlay as a residual which is prone to adjustment and have shown a tendency to cut back capital outlay by around 0.5 per cent of GDP, on average, to meet the FRBM target (RBI, 2020). We thus, expect that state governments may compensate for the unanticipated increase in revenue expenditure due to farm loan waiver programs by a cut in capital outlay to maintain the fiscal deficit under control. The effect of debt waivers on the state finances would also be, heterogeneous and depends on how the state structures the waiver implementation- the initial fiscal condition of the states, the amount of waiver and whether it is financed in a single year or over the years (Suhag and Tiwari, 2018).

The capital outlay in the state governments' budgets is bifurcated into developmental expenditure and non-developmental expenditure. The developmental capital outlay includes spending on the social sectors (education, health, family welfare, housing, water, urban development) and economic services (agriculture and allied activities, rural development, energy, irrigation and flood control, transport,

communication, etc.). If development expenditure is adversely impacted to accommodate the farm debt waivers, it would tend to harm the productive capacity of the state economy as well as the social welfare. Given this, we empirically investigate the following hypotheses:

Hypothesis 2A: *As farm debt waiver announcements are unanticipated shocks, they increase the revenue expenditure and thereby the revenue deficits of the state governments.*

Hypothesis 2B: *Farm debt waiver announcements do not increase the gross fiscal deficit of the state governments due to their commitments under FRA to contain the deficit under 3 percent.*

Hypothesis 2C: *Farm debt waiver announcements lead to a cut in capital outlay and developmental capital outlay.*

Impact of Debt Waiver Announcements on State Finances: Results of Dynamic Panel Model Estimation

We use panel data for the same 16 major non-special category states⁶ from 2001-02 to 2018-19. For hypotheses 2A and 2B, the dependent variables are revenue deficit defined as the difference in current expenditure and current revenue, and gross fiscal deficit defined as the difference between overall expenditure and the non-debt creating receipts. In the case of hypothesis 2C, the dependent variables are capital outlay and developmental capital outlay.

While it would be appropriate to use the actual amount of debt waivers as an independent variable, it is not feasible to do so due to the following reasons. First, the details of debt waivers implemented as reported in the government policy documents are not easily accessible (Phadnis and Goswamy, 2019) and the expenditure head under which

⁶ The “special category” states and smaller states in India receive a preferential treatment in the form of tax breaks and assistance to manage state budgets from the central government, which may influence their decisions about farm loan waivers compared to the other states. Therefore, only NSC states have been included in the analysis. Data pertaining to the state of Andhra Pradesh includes the newly formed state of Telangana from 2014-15 to 2018-19.

the waiver amount is accounted in the budget documents are not reported clearly and some of the waivers are not reflected in the budget speech of the state governments (e.g. Chhattisgarh 2012 waiver). Second, while we collected the information on farm debt waivers from the budget speeches of state finance ministers, government press releases, media reports and studies including Narayanan and Mehrotra (2019), Raj and Edwin (2018), the amounts quoted were not consistent across different sources for some waiver schemes (details on Appendix Table A2) Third, there were additional problems in authenticating the correct amount of waivers since for some states the actual waiver given was much more than the announced amount (e.g. Uttar Pradesh 2012 waiver) and for some states, even the announced amount of loan waiver (e.g. Madhya Pradesh 2018 waiver) was not made available. Finally, the identification of the waiver amounts is further complicated by the fact that waivers are 'staggered over three to five years, either due to phased roll-outs or by clearing bank dues over multi-year payouts' (RBI, 2019). Therefore, we consider the waiver policy announcement as a dummy independent variable in the model and provide a robustness analysis using the debt waiver amount data we collected.

We include a set of control variables such as gross transfers from the centre to the states, own tax revenue of the state, effective interest rate, log of per capita real income that directly affect state expenditures and deficits, the dummy variables for the fiscal rule taking a value of 1 for the years since the FRBM implementation, the state division⁷, and finally for the election years to control for the influence of elections on

⁷. In 2000, the Government of India, following the legislation passed by Parliament, created three new states, Chhattisgarh, Uttaranchal, and Jharkhand, reconstituting Madhya Pradesh, Uttar Pradesh, and Bihar, respectively. Thus, the dummy takes value 1 for the states of Bihar, Madhya Pradesh, and Uttar Pradesh. While these states were bifurcated before our period of analysis starts, the erstwhile state of Andhra Pradesh was bifurcated in 2014 as Telangana and Andhra Pradesh. However, for our analysis, we have combined the data for the two states since the years of bifurcation and we have introduced a 'Telangana' dummy variable that takes value 1 for the state of Andhra Pradesh since the bifurcation year. When a state gets divided the bifurcated state is constrained in terms of resources as the resource-rich part of the state goes to the newly formed state, which in turn affects the state finances

the state expenditure (Table 5). The real per capita income at the state level serves as a proxy for the level of development (Mahdavi, 2004) and also controls for the initial conditions of a state. Gross transfers from the central government and state's own tax revenues represent a major chunk of state government's revenues which in turn has a bearing on the fiscal outcomes of the state⁸. All the deficits, expenditure and revenue related measures are normalized by the GSDP at current prices.

Table 5: Impact of Farm Loan Waiver Announcements on State Finances – Variables Definition and Sources

Variable	Definition	Source
Gross Fiscal deficit	Excess of overall state expenditure over non-debt creating receipts	Handbook of Statistics on Indian States, RBI
Revenue Deficit	Excess of current (consumption) expenditure over current revenue	
Capital Outlay	All development and non-developmental (general services) capital expenditure of government	
Developmental capital outlay	Capital expenditure on social sector (education, health, etc) and economic services (agriculture, flood control, communication, etc.)	State Finances: A study of budgets, RBI
Waiver announcement	Dummy variable taking value 1 if state government announced debt waiver in which some or full principal of farm loan is waived in a particular year and 0 otherwise	Mehrotra and Narayanan (2019); Budget Documents of various state government; PIB for farm loan waivers from Aug 2014 to Jan 2018 and other sources

(Contd.. Table 5)

⁸ India has a quasi-federal structure where the constitution entitles central and state governments to collect certain type of taxes while giving them certain expenditure responsibilities. The tax capacity at the sub-national level is severely constrained; so, there is a provision for inter-governmental transfers from central to state governments. The transfers, though help poorer states by improving their expenditure capability can adversely affect their own tax efforts due to moral hazard problems (Garg *et. al.*, 2017).

Variable	Definition	Source
State elections	Dummy variable taking value 1 if the state had elections to Legislative assembly in that particular year and 0 otherwise	Collated from various state government's website
Fiscal rules dummy	Dummy variable that takes value 1 since the year each state adopted Fiscal Rule Act (FRA), 2005 and 0 otherwise	State Finances: A study of budgets 2013-14, RBI
Telangana dummy	Dummy variable that takes value 1 for the Andhra Pradesh state since the year it was into Telangana and current Andhra Pradesh state and 0 otherwise	The Andhra Pradesh Re-organisation Bill, 2014
State division dummy	Dummy variable that takes value 1 for the states which have undergone bifurcation in 2000	Collated from various state government's website
Real per capita NSDP (2004-05 prices)	Per capita economic output of states in real terms, adjusted for depreciation	Ministry of Statistics and Programme Implementation, Govt. of India
Own tax revenue	Amount of tax revenue earned through state's own resources	Handbook of Statistics on Indian States, RBI
Gross transfer payments	Amount of Shared taxes, non-plan grant-in-aid and plan schemes grant-in-aid transferred by the central government to the states	
Effective interest rate	Interest payments in current year divided by outstanding debt in the beginning of fiscal year	Total Outstanding Liabilities- Handbook of Statistics on Indian States, RBI Gross Interest Payments- Handbook of Statistics on Indian States, RBI

Source: Author's own compilations.

The model includes the lagged dependent variable as one of the regressors to take into account the persistence in deficits and capital expenditures. Also, the independent variables - gross transfers, own tax revenue, effective interest rate and per capita NSDP are potentially endogenous, i.e. they can impact the deficits and the expenditures, and can be simultaneously impacted by them. This causes the independent variables to be correlated with the error term. Thus, we use dynamic panel estimators - difference GMM and system GMM to take into account the above issues in estimation (Arellano-Bond 1991, Arellano-Bover/Blundell-Bond 1995, 1998). We note that the control variables and methodology have been chosen following the approach used by other studies on fiscal measures (see Chakraborty and Dash, 2017). To limit the number of instruments, a maximum lag length of 2 has been specified.

The results of (one-step) system GMM as well as the (one-step) difference GMM suggest that debt waivers are not associated with a change in gross fiscal deficit, but has a positive and significant association with the revenue deficit (Table 6). On average, a farm debt waiver announcement seems to raise the revenue deficit by 0.56 percent to 0.87 percent of the state GDP (estimates of system GMM). Given that the average revenue deficit of the states during the period of the analysis is around 0.5 percent of the state GDP, the results imply that the revenue deficit would more than double in the years when farm debt waivers are announced, *ceteris paribus*. The lag of the dependent variable is significant in all the models, implying that both deficits and expenditures are path-dependent. The coefficients of other independent variables are statistically significant with the expected signs and post-estimation tests are robust. The Hansen test for joint validity of instruments is weak in our model because of instrument proliferation, i.e., the number of instruments is more relative to the number of states (Roodman, 2009a) due to small 'N' compared to 'T' (time period).

Table 6: Impact of farm Debt Waiver Announcement on Gross Fiscal Deficit (GFD) and Revenue Deficit (RD), 2001-02 to 2018-19

Variable	Revenue deficit as a percent of GSDP				Fiscal deficit as a percent of GSDP			
	System GMM		Difference GMM		System GMM		Difference GMM	
	Coeff	Se	Coeff	Se	Coeff	Se	Coeff	Se
Farm debt waiver announced	0.561**	0.224	0.869*	0.477	-0.345	0.436	-0.161	0.513
Revenue deficit to GSDP (t-1)	0.374***	0.097	0.295*	0.147				
Gross fiscal deficit to GSDP (t-1)					0.492***	0.079	0.513***	0.118
Elections	0.204	0.170	0.204	0.174	0.402	0.271	0.444*	0.252
Fiscal rule dummy	-0.503	0.536	-0.332	0.447	-1.001***	0.335	-0.823**	0.304
Telangana dummy	0.805***	0.178	0.310	0.596	0.637**	0.217	0.210	0.658
State division dummy	-6.745*	3.628	0.000	0.000	-1.458	2.076	0.000	0.000
Gross transfer to GSDP	0.048	0.145	-0.087	0.166	0.022	0.188	-0.187	0.193
Tax revenue to GSDP	-0.880***	0.247	-0.401	0.432	-0.368	0.332	0.142	0.417
Effective interest rate	-0.111	0.064	-0.203	0.172	-0.129	0.130	-0.220	0.166
In (per capita real NSDP)	-1.184	1.979	7.045	8.925	-1.051	2.043	3.625	8.781
State Fixed effects	Yes		No		Yes		No	
Time Fixed effects	Yes		Yes		Yes		Yes	
Constant	0.000	0.000	-	-	18.841	25.198	-	-
Observations	271		255		271		255	
Number of states ¹	16		16		16		16	
No. of instruments	51		30		51		30	
AR(1) (Pr > z)	0.01		0.01		0.013		0.008	
AR(2) (Pr > z)	0.36		0.17		0.924		0.448	
Sargan (Prob > chi ²)	0.00		0.00		0.000		0.000	
Hansen (Prob > chi ²)	1.000		1.000		1.000		1.000	

Source: Authors' compilation based on the model results

Note: *** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parantheses

Since a debt waiver increases the revenue deficit but not the gross fiscal deficit, either capital expenditure would face a reduction or there is an improvement in the government's income. There is a significant and negative association between both overall capital expenditure and developmental capital outlay, and debt waivers, suggesting that debt waivers are associated with a reduction in these expenditures to the tune of an average 0.4-0.5 percent of the state GSDP (Table 7). This amounts to an average reduction by one-third in these expenditures given that the average overall capital outlay and development capital outlay is around 1.2-1.3 percent of GSDP. Overall, we find that although debt waivers lead to an increase in revenue deficits, Indian states appear to have complied with the FRA to contain the gross fiscal deficit to 3 percent of GSDP by reducing the development expenditure (Chakraborty and Dash, 2017) and capital outlay.

Table 7: Impact of Farm Debt Waiver Announcement on Capital Outlay and Developmental Capital Outlay, 2001-02 to 2018-19

Variable	Capital outlay to GSDP				Development capital outlay to GSDP			
	System GMM		Difference GMM		System GMM		Difference GMM	
	coeff	se	Coeff	Se	Coeff	se	Coeff	se
Farm debt waiver announced	-0.464*	0.234	-0.521**	0.240	-0.444*	0.230	-0.560*	0.275
Capital outlay to GSDP (t-1)	0.553***	0.097	0.554***	0.098
Development capital outlay to GSDP (t-1)					0.495***	0.109	0.466***	0.136
Elections	-0.076	0.075	-0.079	0.076	-0.029	0.087	-0.042	0.094
Fiscal rule dummy	0.013	0.156	-0.032	0.177	0.064	0.165	-0.004	0.247
Telangana dummy	0.063	0.074	0.180	0.158	-0.065	0.082	0.170	0.159
State division dummy	0.546	1.191	0.000	0.000	0.203	0.556	0.000	0.000
Gross transfer to GSDP	0.079*	0.042	0.113*	0.060	0.124***	0.038	0.155*	0.075
Tax revenue to GSDP	0.257*	0.125	0.164	0.177	0.213*	0.119	0.017	0.191
Effective interest rate	-0.019	0.053	-0.016	0.054	-0.059	0.037	-0.020	0.077
ln (per capita real NSDP)	-0.114	0.781	-1.774	2.767	0.221	0.728	-3.392	3.359
State fixed effects	Yes				Yes			
Time fixed effects	Yes		Yes		Yes		Yes	
Constant	0.000	0.000			-2.978	8.757		
Observations	271		255		271		255	
Number of states	16		16		16		16	
No. of instruments	51		30		51		30	
AR(1) (Pr > z)	0.002		0.005		0.005		0.008	
AR(2) (Pr > z)	0.728		0.734		0.908		0.848	
Sargan (Prob > chi2)	0.019		0.008		0.006		0.005	
Hansen (Prob > chi2)	1.000		1.000		1.000		1.000	

Source: Authors' compilation based on model results

Note: *** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parantheses

As a robustness check, we also estimate the above models using the amount of the waiver instead of the waiver dummy⁹. Since waivers are generally staggered over 3 years, we take 25 percent of the total waiver amount announced (as a percentage of GSDP) across states as the explanatory variable. Our results in terms of the effect of waivers on gross fiscal deficit, revenue deficit, capital outlay and developmental

⁹ In cases, where waiver amounts were not the same across different sources, we have used the RBI report or internal working group reports.

capital outlay are much stronger when we use the partial waiver amount. A 1 percent increase in the waiver amount to GSDP increases revenue deficit by 1.5 percent of GSDP on an average while decreasing capital outlay and within it development capital outlay by almost similar levels (1 percent) of GSDP¹⁰ (Appendix Table A3).

DISCUSSION AND POLICY IMPLICATIONS

The results of our empirical analysis using nearly two decades of panel data indicate that farm debt waivers are used as a strategy to influence the electorate for votes and (or) are implemented as a part of the fulfilment of an electoral promise (Phadnis and Goswamy, (2019) and do not seem to depend on the severity of droughts in contrast to a suggestion by Narayanan and Mehrotra (2019). We also find evidence that the farm debt waivers are associated with an increase in the revenue deficit of the government while lowering the capital outlay and development capital outlay. These results are robust for the effect of any increase in revenue expenditure of the government because of the scheduled state elections. Our estimates may understate the effect of waivers on crowding out development capital outlay, as reflected in our robustness checks.

Given that the capital outlay has the highest multiplier effect on the state's output, among all categories of expenditure (Jain and Kumar, 2013), farmer debt waiver schemes may lower public investment in key social sectors. The persistent nature of these expenditures as captured by the dynamic panel models implies that a reduction in the capital outlay due to a waiver announcement continues to result in lower capital spending in the following year compared to the counterfactual of no waivers. This might in turn affect profitability of agriculture itself as studies such as Fan *et. al.*, (2008), Bahal (2020) show that public spending in rural education, roads, welfare programs are highly

¹⁰ The system GMM also produces similar results. However, the results are not shown here for the sake of brevity.

consequential for local economic activity by increasing both agricultural productivity and demand for the agricultural product through increases in rural incomes. Overall, our results suggest that the effects of farm debt waivers are not just limited to the agriculture sector but spread across the economy by way of affecting the quality of expenditure in the economy.

To solve the agrarian debt crisis, the public policy in India can focus on three key issues- 1) exploring alternatives to farm debt waivers, 2) improving the profitability of farmers by lowering farming costs and increasing farm incomes by improving market access, research and extension services, agro-processing and cold storage facilities, the price negotiating and marketing capability of small and marginal farmers, and promoting sustainable agricultural practices 3) creating productive non-farm employment to pull small and marginal farmers out of farming which would, in turn, encourage the consolidation of small and marginal landholdings and reduce land fragmentation.

In the short run, one of the alternatives to farm debt waivers, which could help protect farmers from idiosyncratic shocks is to set up an agriculture crisis fund that would absorb the cost of the waivers and absorb negative impact on the state's finances (Narayanan and Mehrotra, 2019) or Kerala's model of a 'Farmer's Debt Relief Commission' in 2007, which provides relief to those who need a waiver, rectifies the problem of delays and exclusion of deserving farmers distressed and also lowers the adverse effect on states' finances (Nidheesh, 2018). In addition, some states and the central government also provide a cash transfer to all farmers with land ownership of up to 2 hectares (RBI, 2019).

In the medium term, policies to improve the profitability of small and marginal farms to raise farmers' income and lower farming costs need to be implemented. Nuthalapati *et. al.*, (2020) have shown that farmers receive significantly higher prices to the magnitude of 20 percent or more when they sell directly to supermarkets due to fewer

intermediaries and lower transaction costs. To improve farmers' market access by removing the intermediaries, India enacted in September 2020 three farm reform bills, the Essential Commodities (Amendment) Bill, the Farmers' Produce Trade and Commerce (Promotion and Facilitation) Bill, and the Farmers (Empowerment and Protection) Agreement of Price Assurance and Farm Services Bill, though the implementation of these reforms has been deferred. As agriculture productivity increases, without an increase in marketing and price negotiating power of small and marginal farmers in the domestic and export markets, improvement in cold storage capacity and promote agro-processing industries chances of a price crash may increase, given the relatively inelastic domestic demand (Maheshwar and Chanakwa, 2006). Further, the Government of India (2020) has announced the formation and promotion of 10,000 Farmer Producer Organisations (FPOs) by 2023-24. NABARD (2020) shows that farmer members of FPOs in the states of Punjab and Madhya Pradesh have benefitted via higher prices and reduced cost of production as well as via crop diversification.

The rising farming costs including rising urea and fertilizers' prices (Mitra and Shroff, 2007), depletion of groundwater (Taylor, 2013), rising labour costs (Srivastava, Chand and Singh (2017), low levels of irrigation (Economic Survey of India, 2018), and insurance coverage (Government of India, 2020b) play a significant part in unviability of small and marginal farms (Mishra, 2008; Chuang 2019). Lowering input cost and encouraging cropping pattern shifts to reduce inefficient water usage (Gulati and Mohan, 2018) and lowering spatial inequality would help to make farming sustainable (Rajaraman, 2005).

In the long run, job creation in non-farm sectors would be the best way forward. Despite being an unviable occupation (Manjunatha et. al, 2013), small and medium farms persist because of the lack of sufficient reallocation of labour as job creation in fast-growing sectors (Papola 2006, Kochhar et al, 2006, Erumban et al, 2019, Démurger *et. al.*, 2010; Imai et. al, 2015; Rahman and Mishra, 2020) in the face of face pre-mature deindustrialisation (Rodrik, 2016).

CONCLUSION

This paper provides empirical evidence that despite their negative impact on the productive expenditure of the government, farm debt waiver schemes have gained prominence in India as a political tool. Given the lack of accurate secondary data on the implementation of the farm debt waiver schemes, primary studies that focus on incorporating quantitative and qualitative information about the impact of the debt waivers, if any, at the ground level would further help in the evaluation of the farm debt waiver schemes in India. The overall policy focus should be on raising the profitability of small and marginal farms to permanently lower the burden of farm debt.

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Appendix A

Table A1: Factors Affecting the Announcement of Farm Debt Waiver: Random Effects Model

Variable	(1)	(2)	(3)	(4)	(5)
Elections in the upcoming year	5.802* (5.383)	6.170* (5.737)	3.825 (3.823)	5.063* (4.770)	6.190 (7.919)
Elections in the current year	10.282** (12.130)	9.852* (11.664)	10.982** (12.840)	9.162* (10.807)	34.319* (62.766)
Suicide mortality rate	1.011 (0.041)	1.004 (0.043)	1.012 (0.045)	1.015 (0.040)	
Growth of agricultural GSDP	0.984 (0.037)	0.985 (0.037)	1.001 (0.037)	1.009 (0.046)	
Moderate or severe drought year	1.001 (0.953)	0.975 (0.929)	1.146 (1.162)	1.198 (1.160)	
ln(per capital real NSDP)		1.514 (1.314)			
Agricultural yield (kg/hectare)			0.999 (0.001)		
Growth in yield (percent)				0.983 (0.019)	
Elections in the previous year					2.567 (3.506)
Suicide mortality rate (t-1)					1.041 (0.060)
Growth of agricultural GSDP (t-1)					0.978 (0.044)
Moderate or severe drought (t-1)					0.039* (0.074)
Constant	0.273 (0.250)	0.003 (0.031)	2.931 (5.243)	0.298 (0.270)	0.276 (0.395)
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	106	106	106	106	106
Number of states	16	16	16	16	16

Source: Authors' compilation based on the model results

Note: *** p<0.01, ** p<0.05, * p<0.1, exponentiated standard errors in parentheses

Table A2: Sources of Loan Waiver Announcements of State Governments

State	Waiver Policy Announcement (Month and Year)	Amount of Waiver (INR Billion)	Source 1	Source 2	Source 3
Kerala	Aug 2007	-	Kerala Budget Speech 2006-07 Revised (Page 20)	Naryanan and Mehrotra (2019)	Live Mint
Tamil Nadu	Jul 2006	68.66 ^a	Naryanan and Mehrotra (2019)		
Karnataka	May 2007	15.05	Budget Speech Karnataka (Pg 25, 26)	Economic Times	
Central Government	Feb 2008	522.6	Naryanan and Mehrotra (2019)		
Karnataka	Jul 2012	35	Naryanan and Mehrotra (2019)	Times of India	
Chhattisgarh	Aug 2012	-	Naryanan and Mehrotra (2019)	Business Standard	
Uttar Pradesh	Nov 2011 (actual roll out April, 2012)	16.5 ^b	Naryanan and Mehrotra (2019)	Phadnis and Goswamy (2019)	Chakraborty and Gupta (2017)
Andhra Pradesh	Aug 2014	240 ^c	Phadnis and Goswamy (2019)	Raj and Edwin (2018)	RBI IWG report 2019
Telangana	Aug 2014	170 ^d	Naryanan and Mehrotra (2019)	Raj and Edwin (2018)	RBI IWG report 2019
Chattisgarh	Dec 2015	1.2976 ^e	Press Information Bureau		
Tamil Nadu	May 2016	57.8 ^f	Budget Speech Tamil Nadu (Pg 23)		
Uttar Pradesh	Apr 2017	363.59	Naryanan and Mehrotra (2019)	Phadnis and Goswamy (2019), RBI IWG report 2019	Press Information Bureau
Jammu and Kashmir	Jan 2017	2.447	Naryanan and Mehrotra (2019)	Press Information Bureau	
Punjab	Oct 2017	100	Naryanan and Mehrotra (2019)	Phadnis and Goswamy (2019), RBI IWG report 2019	Press Information Bureau
Maharashtra	Jun 2017	340.22 ^g	Naryanan and Mehrotra (2019)	Phadnis and Goswamy (2019)	RBI IWG report 2019

State	Waiver Policy Announcement (Month and Year)	Amount of Waiver (INR Billion)	Source 1	Source 2	Source 3
Karnataka	Jun 2017	81.67	Naryanan and Mehrotra (2019)	Press Information Bureau	Raj and Edwin (2018)
Rajasthan	Feb 2018	80	Raj and Edwin (2018)	Budget Speech Rajasthan (Pg no. printed 16)	-
Rajasthan	Dec 2018	180 ^h	Naryanan and Mehrotra (2019)	Budget Speech Rajasthan Vote on Account 2019-20 (Pg no. printed 9, 10)	India Today
Karnataka	Jul 2018	340 ⁱ	Phadnis and Goswamy (2019)	Budget Speech Karnataka Jul 2018	The Print
Madhya Pradesh	Dec 2018	360 ^j	Naryanan and Mehrotra (2019)	Budget Speech 2019	-
Chhattisgarh	Dec 2018	61 ^k	RBI IWG report 2019	Budget Speech 2019-20 (Pg 2, 3)	India Today
Assam	Dec 2018	6	Naryanan and Mehrotra (2019)	The Economic Times	

Source: Authors' own compilation

Note:

^aRaj and Edwin (2018)- 65.263 billion

^bChakraborty and Gupta (2017b) initial budget allocated for the loan waiver program was 16.50 billion. However, the actual implementation cost the government much more. By the end of FY 2014-15, 17.2 billion was disbursed as debt relief.

^cNaryanan and Mehrotra (2019)- 430 billion. It is the total loan waiver (farmers, weavers and development of women)

^dPhadnis and Goswamy (2019)- Amount of waiver 163.74 billion

^eNaryanan and Mehrotra (2019)- loan waiver amount - 61 billion, which is the amount provided by Chhattisgarh in its loan waiver of Dec 2018

^fPIB- Amount of loan waiver 53.18 billion, RBI IWG report 2019- 52.8 billion, Naryanan and Mehrotra (2019)- 60.41 billion

^gPIB- Amount of loan waiver 305 billion, Raj and Edwin (2018)- 345 billion

^hBudget Speech Rajasthan 2019-20 mentions that waiver will be of 90 billion plus 60 billion left over by previous government (150 billion). Additionally, they have decided to waive loans up to 2 lakhs for land development bank and cooperative bank (amount of waiver not mentioned)

ⁱRBI IWG report 2019- Amount of waiver- 440 billion.

^jBudget mentions that in Ist phase 70 billion were waived (Dec 18 to Mar 19) and in the 2nd phase they intend to waive 80 billion

^kBudget Speech 2019-20 mentions decision to waive short term farmers' loan from cooperative and grameen bank for 62.30 billion made on 17 Dec 2018, now it decides to extend the scheme to all banks for an additional cost of 40 billion. (total loan waiver 102.3 billion)

Table A3: Amount of Farm Debt Waiver and State Finances: Difference GMM Estimation

Variables	GFD to GSDP	RD to GSDP	Capital outlay to GSDP	Dev. Capital outlay to GSDP
Waiver amount to GSDP	-0.177	1.523**	-0.926*	-1.006**
	(0.946)	(0.713)	(0.459)	(0.427)
GFD to GSDP (t-1)	0.516***			
	(0.119)			
RD to GSDP (t-1)		0.313**		
		(0.143)		
Capital outlay to GSDP (t-1)			0.575***	
			(0.078)	
Dev. capital outlay to GSDP (t-1)				0.489***
				(0.109)
Observations	254	254	254	254
Number of states	16	16	16	16

Source: Authors' compilation based on model results

Note: *** p<0.01, ** p<0.05, * p<0.1, Robust standard errors in parantheses

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