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What's In A Definition?: A Study on Implications and Suitability of Urban Definitions in India through its Employment Guarantee Programme

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What's In A Definition?: A Study On Implications And Suitability Of Urban Definitions In India Through Its Employment Guarantee Programme

Abstract

In this paper, we discuss the political economy of the definitions of urban and rural in India. When using alternative definitions of urban, we find that India is much more urban than is officially recognized. Given that a number of development programmes in India are targeted to rural areas, it is likely that there are incentives to underestimate the extent of urbanization. Using the currently used administrative definition and alternative definitions, we investigate the efficacy of the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), a demand-driven scheme targeted to rural areas. We find that alternative definitions relate better with MGNREGS use than the currently used administrative definition does. When examining whether MGNREGS use is greater in districts where urban population and settlements are underestimated using the current definition as compared to alternative definitions to a greater extent, we do not find evidence of more use in districts that underestimate urban to a greater extent. However, there are inefficiencies in the form of higher unmet demand and lower utilization of predicted persondays of work using the administrative definition. Hence, we argue that the current administrative definition of urban does not capture the true character of places and present a case for exploring alternative criteria for defining urban in India.

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1. Introduction

Countries across the world have adopted different definitions of urban and there is no single globally accepted definition. For instance, some countries focus solely on a population parameter, while others define urban and rural based on the type of local government governing the area. Countries like the United States and United Kingdom have dynamic definitions of urban and rural, wherein different government programmes use different criteria for classifying areas depending on their scope and objectives (Chromartie and Bucholtz 2008; Scott, Gilber, and Gelan 2007), whereas others use a more rigid definition.

Distinguishing between urban and rural areas is important because places with different characteristics are best administered by different governance forms and have different public goods requirements. This is because higher densities in urban areas give rise to externalities that need to be managed and enable economies of scale in public goods provisions. Further, the cost of services breaking down is higher in urban areas due to high densities. Many development schemes, such as public health or anti-poverty schemes, are designed to target rural areas based on the assumption that those in rural areas have poorer socio-economic conditions than those of their urban counterparts. The inherent assumption of many development programmes, public goods allocations, and governance forms that distinguish between urban and rural, is that extant definitions of urban and rural perfectly capture the characteristics of places. However, if this assumption is wrong, it could result in inadequate public goods provision and misallocation of resources due to incorrect targeting, among other problems.

India relies solely on an administrative definition to determine the structure of local governments and to determine eligibility for large sums that are earmarked for urban and rural areas separately. This definition is based on the type of local government governing settlements.¹ There are two types of local governments, that is, Urban Local Bodies (ULBs) governing urban settlements, and rural local bodies, which are also known as panchayats, governing rural settlements. No set criteria exist for which settlements should be classified as urban or rural, but some states have guidelines. However, these guidelines can be arbitrary, and states use considerable discretion in

¹ We refer to independent viable units considered “villages” or “towns” by the Census as settlements.

converting settlements from rural to urban and vice versa. In this paper we make a distinction between urbanization by the administrative definition and urbanization by three alternative definitions viz. census definition, and definitions which use population thresholds of 5000 and 2500 to classify an area as urban. We argue that the true extent of urbanization in India is not captured by the administrative definition. For instance, the state of Kerala is only around 16 percent urban as per the administrative definition, but is around 99 percent urban when we apply alternative definitions. This becomes important when we want to relate growth and poverty with urbanization, since it implies that we are underestimating the effect of urbanization on growth and poverty reduction.

Ministries and departments within state and central governments that are in charge of implementing development schemes along urban-rural lines use the administrative definition. Some of the largest centrally sponsored schemes such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), National Rural Health Mission, and Pradhan Mantri Gram Sadak Yojana are targeted specifically to rural areas. However, since the determination of whether a settlement should be governed by a ULB or panchayat may be arbitrary and may not correctly reflect the character of places, significant misallocation of resources may result.

We investigate this issue through MGNREGS, the Ministry of Rural Development's largest programme, and the world's largest public works programme in terms of number of beneficiaries (Honorati, Gentilini, and Yemtsov 2015). The scheme is designed to be self-selecting so that only the genuinely poor make use of it. If the rationale of targeting rural areas is sound and the scheme's self-selection mechanisms work, we can expect more rural areas to make more use of the scheme's resources.

We identify MGNREGS outcomes and compare them with urbanization rates as per the administrative definition and the alternative definitions. By analyzing these relationships, we investigate the following questions: does the current definition relate with MGNREGS use as would be expected, and do alternative definitions relate better with MGNREGS use; is MGNREGS used more in districts in which the existing definition overestimates rural population and settlements to a greater extent; and does the manner in which MGNREGS is implemented reflect inefficiencies in applying the current definition?

We then assess the suitability of the current definition in identifying the character of settlements, and whether alternative definitions are better suited to do so. This can help to guide eligibility for other schemes that do not have such self-selection mechanisms, and to consider the suitability of the current definition for other aspects of governance such as determining governance forms and taxation.

This paper is divided into 8 sections including the introduction. Section 2 describes the implications of the choice of the urban definition for governance and resource allocation and examines how the current and alternative definitions of urban relate to state level poverty rates, per capita net domestic product, and percentage of workers in agriculture and cultivation. Section 3 presents the context for MGNREGS and relates MGNREGS use to different definitions of urban at the state level. Section 4 explains the empirical strategy of our district level study. Section 5 describes the data sources. Section 6 reports the regression results. Section 7 discusses policy implications of our findings and section 8 concludes.

2. Implications of Urban Definitions

India has two official modes for classifying urban and rural areas. The first, which we call the administrative definition, is based on whether a settlement has an urban or rural local body. The default classification of a settlement is rural and it becomes urban only if the state government converts it through requisite legal processes including notification. The ULBs governing settlements that are urban as per this definition take various forms such as Municipal Corporations, Municipal Councils, and Nagar Panchayats. We call these settlements administratively urban. All residual settlements, which are governed by panchayats, are administratively rural.

The administrative definition is used by state and central governments to channel allocations and implement various schemes along urban-rural lines. For this purpose, separate ministries and departments exist for urban and rural development at the state and central levels. Since taxes tend to be lower in rural areas as compared to urban areas, using imperfect definitions or discretion for conversion from rural to urban in a way that underestimates urbanization has significant fiscal implications and affects the capacity of governments to provide services.

The 73rd and 74th Constitutional Amendment Acts specify the powers and functions of panchayats and ULBs respectively. The 74th Amendment is applicable to administratively urban settlements, enabling their local bodies to include representatives with specific skills in municipal administration and entrusting them with functions including land-use planning, building regulations, and fire services, which are not required of panchayats. Hence, the administrative definition attributes different responsibilities and structures to urban and rural local bodies, which can have significant development and safety implications.

The second mode of classification is the census definition, which is employed by the Census of India. This includes all administratively urban settlements, which the Census refers to as Statutory Towns, together with all ‘Census Towns’ (CTs) and ‘Urban Outgrowths’ (OGs). CTs are administratively rural settlements that the census deems urban using criteria of having at least 5,000 inhabitants, at least 400 people per sq km, and at least 75% of the male main working population engaged in non-agricultural pursuits. OGs are viable units contiguous to towns and possess urban features in terms of infrastructure and amenities. Thus, the administrative definition of urban is a subset of the census definition. CTs and OGs are areas that the Census of India considers urban, but are governed as rural.

State governments hold the power to change these areas from being governed by panchayats to ULBs, but there are several reasons why conversion may be resisted. For one, there is a widely-held perception that administratively rural areas receive more government funding (see Sivaramakrishnan 2002).² Other sources of opposition include voters evading higher taxes (Deshmukh 2014; Jenkins and Anuja 2012), panchayats resisting conversion to preserve power, construction industries avoiding stricter building norms, and State Governments opposing formation of ULBs in places where different political parties enjoy local support (Samanta 2014).

² For instance, in *Sreekala K. v State of Kerala* (2010 (3) KHC 385), the conversion of panchayats to ULBs was specifically resisted on the grounds that this “will deprive large Sections of the society the benefits distributed by Village Panchayats including the benefit of the scheme, viz. ‘National Rural Employment Guarantee Scheme’ which are being implemented by the Panchayats concerned, with the funds provided by the Central Government and State Government.” Towns have also reportedly obtained rural classification with the expectation of more rural government funding, only to revert to urban status after not receiving expected funds as was seen in the case of Tamil Nadu (Tamil Nadu Government Orders 2006; Madhavan 2006). On the other hand, cities have sought to expand their municipal limits to bring a larger population in their fold to receive grants under the Jawaharlal Nehru National Urban Renewal Mission (Times of India 2015).

Table 1 shows the urban populations and urbanization rates in India for the years 1991, 2001, and 2011 by the administrative and census definitions. This includes all states and union territories (UTs) except Jammu & Kashmir as the 1991 census was not carried out there. Comparing the divergence between the urban population when using both definitions, we find that the percent of urban population as per the census definition that was administratively rural (i.e. the CT and OG population) fell from 11 per cent to 8 per cent between 1991 to 2001, but increased to 16 per cent in 2011.³ It may be noted that MGNREGS was launched in 2005, and in the following census the share of urban population governed as rural rose above 1991 levels. This raises the question of whether government schemes based on urban-rural classifications create incentives for settlements to be classified as rural.

[Insert Table 1]

The definitions that are currently in use in India are among many that countries across the world use to define urban and rural areas. As a counterfactual, we propose two alternative definitions for urbanization and calculate how urban India would be using these definitions. Both definitions use a population threshold to determine if a settlement is urban or rural. According to the first definition, a settlement is urban if it has a population greater than 5000 (5000+ population), and is rural otherwise. This definition is used by countries such as Ghana and Qatar. According to the second definition, a settlement is urban if it has a population greater than 2500 (2500+ population), and is rural otherwise.⁴ This definition is

³ This analysis assumes that the Census identifies CTs with reasonable consistency. Pradhan (2013) noted that the Census exercises considerable discretion while categorizing CTs based on the three criteria discussed above, and 1625 of the 2532 new CTs identified by the 2011 Census satisfied the criteria for inclusion in 2001. Similarly, there may be more villages that satisfy the criteria in 2011, which will only be identified as CTs in 2021. One can assume that such estimations will have similar rates of accuracy at each Census, but even if this is not the case, since the Census definition has relatively strict criteria for inclusion (Ganapati 2014), one can assume that the urban population governed as rural is large and growing since the population of administratively rural settlements has been growing (IDFC Foundation 2015), and a large settlement population is a widely accepted criterion for defining urban, as we will discuss later.

⁴ More countries, like Argentina and Ethiopia, use a 2000 cutoff rather than 2500, but we took the more conservative number that would tend to underestimate urban population.

used by Mexico and Venezuela. Table 2 shows India's urbanization rate using the administrative and alternative definitions.⁵

[Insert Table 2]

Only 26 per cent of India's population is governed by ULBs. However, India's urbanization rate is around 65 per cent if we use the 2500+ population definition. Hence, the perception that urbanization rates in India are comparatively low (See Mohan and Dasgupta 2004) may be largely because urban definitions in India significantly underestimate urbanization rates.

Studies have established a link between urbanization and socio-economic indicators (See Spence, Annez, and Buckley 2009; Khan 2000), and one way to examine the suitability of various urban definitions is to identify which definitions relate most closely with these indicators. If our measure of urbanization in India is itself wrong, linking urbanization with other variables may be tenuous. In a system that justifies special treatment to administratively rural areas because they are thought to be more deprived, an examination of the relationship between the chosen definition and development indicators is warranted. To do this, we look at the relationship of the four definitions of urbanization with the percent of population living below the poverty line (BPL population)⁶ and the per capita Net State Domestic Product (NSDP)⁷ at the state and UT level^{8,9}. For NSDP we drop Dadra & Nagar Haveli, Daman & Diu, and Lakshadweep because data for these UTs is not available.

⁵ There are, of course, other ways to conceptualize and define urbanization. For instance, according to Satterthwaite and Tacoli (2002), two essential characteristics of an urban place are significant population relying on secondary and tertiary activities for livelihoods, and high population densities. Others use parameters such as densities, built-up area, and contiguous development. For instance, see Uchida and Nelson (2010), Denis and Marius-Gnanou (2011), and Jana, Sami, & Seddon (2014). We chose accepted parameters that are used by other countries that employ a fundamental understanding of urban as a larger settlement, because of which governance and allocation requirements can be considered as different.

⁶ We make use of the poverty lines estimated by the Report of the Expert Group to Review the Methodology for Measurement of Poverty under the Chairmanship of Dr. S. Tendulkar in 2009 and the 68th round of the National Sample Survey for 2011-2012 to calculate the proportion of the population that is below poverty line. In 2014, the Report of the Expert Group to Review the Methodology for Measurement of Poverty under the Chairmanship of Dr. C. Rangarajan also estimated poverty lines for all states. However, since this Report was not formally accepted by the government, we use the poverty lines as provided by the Tendulkar Committee.

⁷ We use NSDP data provided by the Planning Commission. The per capita NSDP used is in 2004-05 prices.

⁸ This includes 28 states and 7 UTs. Telangana, which was carved out from the state of Andhra Pradesh in 2014, is not looked at separately because our data precedes the formation of Telangana.

[Insert Figure 1]

We see that the relationship between poverty rate and urbanization as depicted in Figure 1 is negative for all definitions. The relationship between poverty rate and urbanization using the administrative definition has the lowest coefficient and R-square. The relationship between poverty rate and urbanization using the census definition has the highest coefficient, and between poverty rate and urbanization using the 5000+ population definition has the highest R-square. The relationships between poverty rate and urbanization using the administrative definition, census definition, 5000+ population definition, and 2500+ population definition have coefficients of -0.08, -0.19, -0.19, and -0.17 respectively, and R2 values of 0.01, 0.14, 0.15, and 0.12 respectively.

[Insert Figure 2]

Figure 2 shows that the relationship between per capita NSDP and urbanization is positive for all definitions. The relationship between per capita NSDP and urbanization using the 2500+ population definition has the lowest coefficient and R-square, whereas the relationship when using the census definition has the highest coefficient and R-square. The relationship between per capita NSDP and urbanization using the administrative definition, census definition, 5000+ population definition, and 2500+ population definition have coefficients of 1282.8, 1422.3, 991.8, and 875.13 respectively, and R2 values of 0.302, 0.521, 0.313, and 0.229 respectively.

Oftentimes, the distinction between urban and rural areas is also linked with the nature of economic activities in these areas, that is, whether the predominant economic

⁹ We also analyzed how urbanization using different definitions correlates with poverty ratios and per capita NSDP after dropping observations for UTs. We find that our results continue to hold, and urbanization using the administrative definition has the lowest coefficient with poverty rates and urbanization using the 2500+ population definition has the lowest coefficient with per capita NSDP.

activity is agriculture or not.¹⁰ We therefore examine the relationship between the percentage of the workforce engaged in agriculture and cultivation and urbanization using the different definitions at the state and UT level.¹¹

[Insert Figure 3]

We see from Figure 3 that the relationship between the share of working population engaged in agriculture and cultivation and urbanization rates using the different definitions is negative throughout. The administrative definition has the lowest coefficient and R-square. The census definition has the highest coefficient and R-square. The relationship between the share of working population engaged in agriculture and cultivation and urbanization using the administrative definition, census definition, 5000+ population definition, and 2500+ population definition have coefficients of - 0.52, - 0.85, - 0.73, and - 0.69 respectively, and R2 values of 0.18, 0.73, 0.64, and 0.53 respectively.

Governments may prefer targeting schemes or channeling allocations specifically to rural areas on two accounts. First, rural areas fare worse economically since they do not experience agglomeration economies, and agriculture, which predominantly takes place in rural areas, is subject to constant or diminishing returns (Bardhan 1973; Krugman 1991). Second, governments may want schemes to reach the most deprived populations, who tend to live in rural areas and are worse off in terms of socio-economic outcomes.¹² The above analysis shows that the administrative definition used by the government to provide earmarked rural allocations does not have the strongest relationship with socio-economic indicators or with the share of working population engaged in agriculture and cultivation. The census definition and 5000+ definitions appear more suitable. This makes a case for using alternative definitions, particularly for purposes that treat rural areas separately because of their more deprived or agrarian nature.

¹⁰ The equation of rural with agriculture is used commonly in policy discourse, for instance see Lok Sabha Discussions (2005).

¹¹ We use the 2011 census data to calculate the proportion of working population engaged in agriculture and cultivation.

¹² According to Khan (2000, p.6), "...the conditions of the rural poor are far worse than those of the urban poor in terms of personal consumption levels, and access to education, healthcare, potable water and sanitation, housing, transport, and communications."

In the remainder of the paper, we examine the suitability of the currently used administrative definition to target rural schemes through a study of MGNREGS.

3. MGNREGS in Context: Policy Design

The Mahatma Gandhi National Rural Employment Guarantee Act was passed in 2005 to enhance “livelihood security” of households in rural areas by providing at least 100 days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work. It is a social safety net in the form of a right to work, which also creates durable assets such as roads and irrigation works in villages through the shelf of work for which beneficiaries are employed. Between April 2006 and December 2014, the government provided employment to 392 million households and spent Rs. 1830132 million on wages to beneficiaries under this scheme (Mahatma Gandhi National Rural Employment Guarantee Act- Report to the People 2014, p.9; 2015, p.9). During this seven year period, the average of the annual share of total MGNREGS expenditure to GDP was 0.4 percent.¹³

In terms of policy design, two features of MGNREGS are worth noting. The first is that it uses a place-based criterion wherein households in places that are administratively rural are eligible for the scheme.¹⁴ Second, since the wages paid are low and beneficiaries are required to do manual work, there are in-built self-selection mechanisms so that only the most deprived will demand employment under the scheme. However, studies have shown that because of information asymmetries (Shankar, Gaiha, and Jha 2011), corruption (Shankar, Gaiha, and Jha 2010), and lack of administrative capacity (Bonner et. al. 2012), the most deprived people may not get access to MGNREGS. It has also been argued that the poorest areas do not necessarily get the most MGNREGS allocations¹⁵, and past studies have

¹³ GDP measured in Market Prices as released by the Reserve Bank of India's 2013-14 Handbook of Statistics on Indian Economy.

¹⁴ However, both before and after the launch of the scheme, there have been calls to extend the programme to urban areas.

¹⁵ Accountability Initiative's analysis found that in 2010-11, poorer states such as Uttar Pradesh, Bihar, West Bengal, and Madhya Pradesh, which together account for 59 per cent of the country's rural BPL population, generated only 34 percent of employment through MGNREGA. On the other hand, Andhra Pradesh and Tamil Nadu, which house eight percent of the BPL population, accounted for 23 percent of the total employment generated that year. See Kapur and Chowdhury (2012).

found that self-selection works to varying extents across time (Sheahan, Liu, and Barrett 2014) and places (Jha et al. 2013, Dutta et al. 2012).

In terms of the implementation process, a significant number of functions are undertaken by lower levels of government. The District Programme Coordinator prepares a labour budget before each financial year with details of anticipated demand for the scheme and the plan to absorb this demand by providing adequate works. This is submitted to the district panchayat¹⁶, and forms the basis for planning works and budgeting allocations. If eligible households demand work under the scheme but the government is unable to provide it within 15 days, a prescribed unemployment allowance is payable to them.

To the best of our knowledge, existing research does not analyze allocations under MGNREGS to see whether more rural districts - which could be expected to be more deprived than less rural districts - see greater utilization of the scheme. Existing research also does not question whether the currently used administrative definition, which classifies urban and rural based on the local governance structures of settlements, is appropriate. If rural areas are more deprived than urban areas, and if the administrative definition of urban and rural correctly identifies rural areas, more rural districts would see higher MGNREGS use in terms of expenditure and persondays generated if the scheme's self selection mechanisms broadly worked. To examine how MGNREGS use relates to the administrative definition, we analyze the relationship of total expenditure and persondays of work generated under MGNREGS with urbanization rates using the administrative definition at the state and UT level. We also analyze the relationship of these MGNREGS use indicators with urbanization rates using the Census, 5000+, and 2500+ definitions.

[Insert Figure 4]

Figure 4 depicts the relationship between total MGNREGS expenditure per eligible person, where eligible persons refer to the total rural population using the administrative definition, and urbanization rates using the four urban definitions.

¹⁶ The 73rd Constitutional Amendment mandates panchayats, or local units of self governance, to be formed at the village, intermediate, and district levels.

Contrary to expectations, the relationship is positive for the administrative definition, indicating that more urban states receive more MGNREGS expenditure. The sign reverses for the other definitions. R-square is lowest with the administrative definition. Among the alternative definitions, the coefficient is lowest with the census definition. The coefficient and R-square are highest with the 5000+ population definition. The relationship between total MGNREGS expenditure per eligible person and urbanization using the administrative definition, census definition, 5000+ population definition, and 2500+ population definition have coefficients of 0.75, -8.57, -9.11, and -8.93 respectively, and R2 values of 0, 0.03, 0.04, and 0.03 respectively.

[Insert Figure 5]

Figure 5 depicts the relationship between total persondays generated per eligible person under MGNREGS and urbanization rates using the four definitions. Again the relationship between persondays generated and urbanization using the administrative definition is positive but is negative when using other definitions. The coefficient and R-square are lowest when using the administrative definition, and highest when using 5000+ population definition. The relationship between total MGNREGS persondays generated per eligible person and urbanization using the administrative definition, census definition, 5000+ population definition, and 2500+ population definition have coefficients of 0.01, -0.04, -0.05, and -0.05 respectively, and R2 values of 0, 0.03, 0.03, and 0.03 respectively.

We find that, at the state and UT level, indicators measuring MGNREGS use relate poorly with urbanization using the administrative definition, though the relationship is weak in all cases. This prompts us to examine how different definitions for urbanization relate with MGNREGS indicators at the district level. If we find that alternative definitions relate better with MGNREGS outcomes as compared to the administrative definition, we have a case for rethinking the use of this definition. We could also make this case if we find that MGNREGS is used more in districts in which the administrative definition overestimates rural population and settlements, as this may indicate that urban settlements that remain governed by panchayats are accessing a disproportionately large portion of the scheme's resources.

4. Empirical Strategy

To analyze the relationship between MGNREGS outcomes and urbanization rates, we use 12 independent variables to measure urbanization characteristics and 6 dependent variables to measure MGNREGS outcomes.

We use two approaches to measure urbanization characteristics.

The first approach is a straightforward application of urban definitions. It considers U_i , which represents the proportion of population in district i that lives in settlements categorized as urban. Hence:

$$U_i = \frac{\text{Urban Population}_i}{\text{Total Population}_i}$$

in district i .

We apply four definitions of urban to categorize settlements, to see whether the relationship between urbanization and MGNREGS outcomes changes when we use the administrative definition as compared to alternative definitions, that is the census definition, the 5000+ population definition, and the 2500+ population definition.

The second approach employs a new way to interpret urbanization rates. It considers $R(\text{infl})_i$, which represents the rural inflation in district i , where rural inflation is the extent to which the administrative definition overestimates rural rates as compared to alternative definitions. Since there is a widely-held perception that urban settlements remain administered as rural for access to rural government funds, this approach will enable us to assess whether districts in which rural rates are overestimated more by the administrative definition receive more MGNREGS resources, if we assume that alternative definitions are more accurate. In other words, this indicates whether the extent to which urbanization is underestimated in districts by the administrative definition is related with the use of MGNREGS resources, and whether this use is in accordance with their actual urban nature, assuming that alternative definitions are more accurate than the administrative definition.

We use two methods to calculate $R(\text{infl})_i$ viz a viz the administrative definition. The first method is the population measure of rural inflation, $R(\text{infl})_i_pop$, for which we

calculate the difference between the proportion of urban population when using an alternative definition and the administrative definition. That is:

$$R(\text{infl})_i_{\text{pop}} = \frac{\text{Urban Population by Alternative Definition}_i - \text{Urban Population by Administrative Definition}_i}{\text{Total Population}_i}$$

in district i.

However, there is a chance that the actual extent of rural inflation may not be captured using this method if a similar number of people move from urban to rural settlements and from rural to urban settlements when changing from the administrative to alternative definitions. Moreover, the proportion of rural settlements may influence perceptions of the extent of a district's rural nature as much as the proportion of rural population, and the status of settlements is the primary eligibility criterion of MGNREGS. To account for this, we also use a second method to calculate rural inflation, which is the settlement measure of rural inflation, $R(\text{infl})_i_{\text{settl}}$, which has two variables.

The first variable is the number of settlements that are urban by an alternative definition but rural by the administrative definition as a proportion of the total number of settlements. Hence, assuming that the alternative definitions are more accurate than the administrative definition, this variable, $R(\text{infl})_i_{\text{settl_eligible}}$, represents the proportion of settlements that are eligible for the rural scheme because they are inaccurately categorized as rural by the administrative definition. That is:

$$R(\text{infl})_i_{\text{settl_eligible}} = \frac{\text{Number of Settlements Categorized as Urban by Alternative Definition but Rural by Administrative Definition}_i}{\text{Number of settlements}_i}$$

The second variable is the number of settlements that are rural by an alternative definition but urban by the administrative definition as a proportion of the total number of settlements. Hence, assuming that the alternative definitions are more accurate than the administrative definition, this variable, $R(\text{infl})_i_{\text{settl_denied}}$, represents the proportion of

settlements that are denied access to the rural scheme because they are inaccurately categorized as urban by the administrative definition¹⁷. That is:

$$R_{(infl)_i_settl_denied} = \frac{\text{Number of Settlements Categorized as Rural by Alternative Definition but Urban by Administrative Definition}_i}{\text{Number of settlements}_i}$$

Since a settlement cannot be urban by the administrative definition but rural by the census definition, the settlement measure of rural inflation using the census definition does not include this variable. The settlement measure of rural inflation has two variables for the 5000+ and 2500+ population definition of urban viz. $R_{(infl)_i_settl_eligible}$ and $R_{(infl)_i_settl_denied}$.

Among MGNREGS outcome variables, three directly measure MGNREGS use. These are total expenditure per eligible person, expenditure on unskilled wages per eligible person - which reflect monetary values, and total persondays generated per eligible person - which reflects real values. Unskilled wages is the amount paid to MGNREGS beneficiaries, representing the transfer to the people the scheme is intended to benefit. Persondays generated is the number of days of work created by the scheme for beneficiaries.

The other three MGNREGS outcome variables measure efficiency in the implementation of MGNREGS. The first is persondays generated as a proportion of persondays projected in the labour budget, which is submitted by every district to estimate MGNREGS demand. This variable reflects the utilization of predicted persondays. The second is number of days for which unemployment allowance was payable as a proportion of persondays generated, which reflects unmet demand. The third is funds utilized as a proportion of total available funds, which reflects funds utilization. Values of these efficiency variables are missing for some districts in the MGNREGS Management Information System, so these districts are dropped from individual regression rounds. For utilization of predicted persondays we drop districts in Arunachal Pradesh, Dadra & Nagar Haveli, Daman & Diu, Puducherry, and Chandigarh. For unmet demand we drop districts in

¹⁷ While this variable technically captures urban inflation, we include it in our rural inflation measure to account for settlements that move both from rural to urban and from urban to rural when changing between the administrative and alternative definitions. We call this a variable of rural inflation for simplicity, and consider it as a potential offset to rural inflation that is accounted for in the same regression round.

Andhra Pradesh, Daman & Diu, and Upper Siang district of Arunachal Pradesh. For funds utilization we drop districts in Andhra Pradesh, Daman & Diu, and Chandigarh.

Each MGNREGS outcome variable is regressed on each urbanization indicator. We run 5 rounds of each of these regressions adding control variables in each round. The first round of regressions has no control variables. In the second round we add state fixed effects; in the third round we add state dummy variables for UTs and BIMARU, southern, and hill states; in the fourth round we add district development variables, and in the final round we add political economy variables. Appendix A describes the dependent and independent variables that we have used. Hence, the regressions we run are:

1. With urbanization measured by proportion of urban population:

$$Y_i = c + \alpha U_i + \beta F + \gamma S + \delta D_i + \varepsilon P + e$$

2. With urbanization measured by rural inflation:

$$Y_i = c + \alpha R(\text{infl})_i + \beta F + \gamma S + \delta D_i + \varepsilon P + e$$

- a) Using the population measure of rural inflation:

$$Y_i = c + \alpha R(\text{infl})_{i_pop} + \beta F + \gamma S + \delta D_i + \varepsilon P + e$$

- b) Using the settlement measure of rural inflation:

$$Y_i = c + \alpha R(\text{infl})_{i_settl_eligible} + \theta R(\text{infl})_{i_settl_denied} + \beta F + \gamma S + \delta D_i + \varepsilon P + e$$

where Y is an indicator of MGNREGS outcomes and i indexes districts. The urbanization indicators used are U_i , $R(\text{infl})_{i_pop}$, $R(\text{infl})_{i_settl_eligible}$ and $R(\text{infl})_{i_settl_denied}$. U_i is estimated for all 4 definitions, $R(\text{infl})_{i_pop}$ is estimated for the 3 alternative definitions, $R(\text{infl})_{i_settl_eligible}$ is measured for the three alternative definitions, and $R(\text{infl})_{i_settl_denied}$ is measured for the 5000+ and 2500+ population definitions. F is the control variable for state fixed effects, S is the vector of state dummy variables for UTs and BIMARU, southern, and hill states¹⁸, D is the vector of control variables for district development indicators, P is the vector of control variables for political economy characteristics, and e is the error term.

¹⁸ UT dummies are added to account for the difference in their administrative structure. The central government exercises a greater degree of control over UTs. Several studies use BIMARU (Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh) dummies to account for the socio-economic backwardness of these states (see Gahai et al. 2010). Southern states are often juxtaposed with Northern states because of factors including differing cultures and socio-economic conditions (see Paul and Sridhar 2015). Hill states have unique geographic conditions that affect their economic development (see Planning Commission 2013).

This is a cross sectional model since population data is available only for a single year since the scheme was launched. We use natural logs of the values plus one ($\ln(x + 1)$) to account for zero values of certain variables. Natural logs have not been used for dummy variables and in cases where variables have negative values for some districts¹⁹. We look at districts as the unit of analysis for the following reasons: it is the lowest unit at which MGNREGS Management Information System's data matches census data, so that MGNREGS outcomes can be compared with population, literacy, and other characteristics measurable by census data; it is also an appropriate unit through which to study MGNREGS because the Act provides for a significant amount of organization and administration - including the preparation of labour budgets based on which allocations are made - to be done at the district level, and so outcomes can be significantly impacted by district level management.

5. Data

Our two main sources of data are the Census of India 2011 and reports published online by the MGNREGS Management Information System for the year 2012-13. For the monthly per capita expenditure and poverty ratios, we used data from the 68th round of the National Sample Survey for 2011-2012. We use expenditure data calculated by the mixed reference period, wherein information on expenditure for the last 365 days is collected. Data on the dummy variable for state assembly elections was collected from the Election Commission of India. District luminosity²⁰ has been calculated using data available on the website of the National Centers for Environmental Information, National Oceanic and Atmospheric Administration. We use the data on average lights for the year 2012 collected by satellite F18 of the Defense Meteorological Satellite Program. We used district shapefiles from DIVA-GIS.²¹ Our analysis is restricted to those districts in which MGNREGS has been implemented, which are 624 districts as per the 2011 Census, because data such as population and literacy rates are only available separately for these districts. Where new districts were formed after the 2011 census, we take the simple average of the MGNREGS

¹⁹ These are the three population measures of rural inflation, that is $R(infl)_i_pop$.

²⁰ Night-time luminosity has been used to study levels of development and urbanization, among other things. Bhandari and Roychowdhary (2011) find that district level night light data significantly explains district GDP in India.

²¹ Developed by Dr. Robert Hijmans, University of California, Davis.

and National Sample Survey data for the new districts and the original districts from which they were created. Siliguri Mahakuma Parishad is a subdivision within Darjeeling district, but the MGNREGS Management Information System records information for it as though it is a separate district. We took simple averages of MGNREGS values for Siliguri and Darjeeling to obtain final values for Darjeeling district.

6. Regression Results

We report our regression results in three sections. First, we regress MGNREGS use variables with proportion urban population variables, then we regress MGNREGS use variables with rural inflation variables, and finally we regress MGNREGS efficiency variables with proportion urban population and rural inflation variables.

We employ White's test to test for heteroskedasticity. We find that heteroskedasticity is prevalent and as a result we make use of robust standard errors. The tables for regression results are in the appendices.

i. MGNREGS use and proportion of urban population

If the rationale of targeting rural areas is sound and the scheme's self-selection mechanisms work, we would expect more urban districts to see less MGNREGS use. Table 3 shows the relationship between MGNREGS and proportion urban population by all four definitions. The complete results showing the relationship between MGNREGS use and proportion urban population together with all control variables are provided in Appendix B. Among the three variables measuring MGNREGS use, persondays generated relates positively and significantly with the proportion urban population by administrative definition. No MGNREGS use variable relates significantly with the census definition. Persondays generated and the expenditure on unskilled wages relate negatively and significantly with the 5000+ and 2500+ population definitions, with the coefficient increasing for the 2500+ population definition. Total expenditure also relates negatively and significantly with the 2500+ population definition.

[Insert Table 3]

ii. MGNREGS use and rural inflation

If the perception that urban areas remain classified as rural in order to benefit from rural development schemes is true, and the scheme's self-selection mechanisms do not work, we would expect to see higher MGNREGS use in districts that have higher rural inflation. However, we find that all three MGNREGS use variables relate negatively and significantly with the population measure of rural inflation and with the first variable of the settlement measure of rural inflation, which calculates the proportion of settlements inaccurately categorized as rural by the administrative definition. Table 4 shows the relationship between MGNREGS use and rural inflation. The complete results showing the relationship between MGNREGS use and rural inflation together with all control variables are provided in Appendix C. The coefficient increases between rural inflation when using the census definition and rural inflation when using the 5000+ population definition for all MGNREGS use variables. It decreases for rural inflation when using the 2500+ population definition. MGNREGS use does not relate significantly with the second variable of the settlement measure of rural inflation, which calculates the proportion of settlements inaccurately categorized as urban by the administrative definition.

[Insert Table 4]

iii. MGNREGS efficiency and urbanization

Table 5 shows the relationship between measures of MGNREGS efficiency and urbanization measures. The complete results showing the relationship between efficiency of MGNREGS and urbanization together with all control variables are provided in Appendix D. We find that utilization of predicted persondays relates negatively and significantly with the administrative definition, and positively and significantly with the population measure of rural inflation when using the census definition. Unmet demand relates positively and significantly with the proportion of urban population by the administrative and census definitions. Funds utilization relates negatively and significantly with the first component of the settlement measure of rural inflation when using the 5000+ and 2500+ population definitions.

[Insert Table 5]

7. Policy implications

Looking at the results in tandem, we do not find evidence that districts with higher rural inflation make greater use of MGNREGS, suggesting that the self-selection mechanisms of the scheme may be working. Even if this is the case, the current system confers arbitrary advantages and disadvantages by basing eligibility on state government discretion in categorizing rural areas. Since MGNREGS use variables relate better with the proportion of urban population using the 5000+ and 2500+ population definitions than with the administrative definition, and the administrative definition shows the opposite of the expected relationship wherein more administratively rural districts tend to make less use of MGNREGS, it may not be appropriate to use the administrative definition of rural. This may be even more pertinent for other rural allocations and policies that do not have self-selection mechanisms to ensure that the most deprived people benefit.

The positive relationship between the proportion of urban population using the administrative definition and MGNREGS use may also be attributed to other factors. For instance, district administrative staff of more administratively urban districts may be more adept at appropriating government resources, or information asymmetries may be less in more urban districts leading residents to demand more government resources. However, we believe that it is more plausible that the relationship indicates that the administrative urban definition is a poor indicator of the character of the district. This is supported by the fact that we do not find evidence of districts with higher inflated rural rates making more use of the scheme, and that development indicators do not relate best with the administrative definition when compared to alternative definitions.

MGNREGS is used less efficiently in districts that are more urban by the administrative definition, where efficiency is measured by utilization of predicted persondays and unmet demand. It is interesting to note that more administratively urban districts tend to experience less demand than is predicted, and though work is meant to be planned based on predicted demand, these districts tend to be less able to provide work for those who demand it. Such districts tend to pay more unemployment allowance, essentially giving away “free money” to those who demand work but are not given work

under the scheme. This may occur if more administratively urban districts are making larger projections of demand to receive more allocations, are more focused on concerns other than creating a shelf of work that is able to absorb their projected demand, or are poorer at predicting and meeting demand in rural settlements. In any case, it reflects inefficiency of using the current definition to administer the scheme.

When considering the efficiency of MGNREGS implementation as measured by fund utilization, we find that districts with higher rural inflation have lower fund utilization when using the settlement measure of rural inflation for the 5000+ and 2500+ population definitions. In other words, districts that have a higher proportion of settlements that would become ineligible for MGNREGS if we used the 5000+ and 2500+ population definitions tend to use less of the allocated funds. This may make the change to other eligibility criteria more politically feasible.

Assuming alternative definitions are more suited to identify rural areas, using alternative definitions to determine eligibility for MGNREGS will have the following implications for allocations: i) the wages paid to eligible persons will increase, or ii) the total expenditure will reduce resulting in savings for the government. To gauge indicative impacts, we consider that when using alternative definitions, the total number of eligible persons decreases from 892 million to 833 million in case of the census definition, 639 million in case of the 5000+ definition, and 425 million in case of the 2500+ definition. Hence, while the expenditure on unskilled wages per eligible person in 2012-13 was Rs. 304 using the administrative definition, this amount would increase to Rs. 325 using the census definition, Rs. 424 using the 5000+ population definition, and Rs. 639 using the 2500+ population definition, which is over double the current availability. Alternatively, if the unskilled wage expenditure per eligible person is held constant at Rs. 304, the total unskilled wage expenditure will reduce from Rs. 271,535 million to Rs. 253,968 million using the census definition, Rs. 194,498 million using the 5000+ definition, and Rs. 129,216 million using the 2500+ definition, which is a reduction of over 50%.

We recognize the difficulty in formulating urban and rural definitions that are perfectly suited for all scenarios and the political difficulties of changing definitions. Hence, India may begin by altering definitions used to determine eligibility for particular programmes, an approach used in countries like the US and UK, where different concepts

of rural are used by different government programmes depending on their objectives (See Hewitt 1992; Isserman 2005; Isserman 2007; Scott, Gilber, and Gelan 2007; West et. al. 2010).

8. Conclusion

In this paper, we examine the efficacy of the present definition of urban and rural in India for local governance and targeting development schemes through the study of MGNREGS. We calculate the proportion of urban population at the state and district level using the currently used administrative definition, census definition, 5000+ population definition, and 2500+ population definition. We then compare the relationship between urbanization rates using the four definitions and development outcomes at the state and UT level. We find that the census and 5000+ population definitions relate better than the administrative definition does with poverty rates, per capita NSDP, and percent of workers in agriculture and cultivation. If differential treatment for rural areas is justified because of their more deprived or agrarian nature, alternative definitions reflect these characteristics better. We then study how the definitions relate with MGNREGS use. When applying the administrative definition, more urban states have higher MGNREGS expenditure and persondays of work created per eligible person, whereas all three alternative definitions show the opposite relationship, as would be expected if the scheme's rationale of targeting rural areas was sound and the scheme targeted beneficiaries efficiently.

We then undertake a district level analysis to understand the relationship between urbanization and MGNREGS. We identify variables to measure: a) MGNREGS use and efficiency, b) urbanization rates as per the four definitions, and c) extent of rural inflation, that is, how much the administrative definition overestimates rural rates if we assume alternative definitions are more accurate. We control for state fixed effects, state dummy variables, district development indicators, and political economy characteristics.

When examining MGNREGS use, we find that more administratively urban districts have more persondays of work generated, whereas districts that are more urban by the 5000+ and 2500+ population definitions have fewer persondays of work generated and lower expenditure on wages paid to beneficiaries. We argue that this demonstrates

that the 5000+ and 2500+ population definitions reflect MGNREGS use better than the administrative definition does, and therefore there is a case for rethinking the use of the administrative definition to determine allocations. However, we do not find any evidence that MGNREGS is used more in districts in which the administrative definition overestimates rural population and settlements to a greater extent.

When examining MGNREGS efficiency, we find that more administratively urban districts have less utilization of predicted persondays but more unmet demand, which suggests that MGNREGS is functioning inefficiently through the administrative definition. Districts in which the administrative definition inflates the proportion of rural settlements more when using the 5000+ and 2500+ population definitions have lower fund utilization rates, suggesting that allocations using the administrative definition are not optimally used, and that a move away from this criteria may be more politically feasible.

Our findings suggest that the current definition used for identifying urban and rural areas and channeling funds for development schemes may not be qualified for the role. There is merit in identifying alternative criteria for determining urban and rural that are better at capturing the character of places. However, changing the way urban and rural are defined may be politically difficult if those who would be potential losers are powerful enough to oppose any deviation in the status quo. In the meanwhile, it may be better for policymakers to rely on criteria that can be measured objectively.

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TABLES & FIGURES

Table 1: Trends in India's urban population								
Year	Urban population (in millions)		Difference between census and administrative definition (CT and OG population) (in millions)	Total population (in millions)	Urbanization rate (in percent)		CT and OG population /total population (in percent)	CT and OG population /urban population by census definition (in percent)
	Administrative definition	Census definition			Administrative definition	Census definition		
1991	191	215	24	838	22.9	25.7	2.87	11.14
2001	260	283	23	1028	25.6	27.8	2.27	8.16
2011	315	373	58	1210	26.3	31.21	4.87	15.6

Source: Census of India 1991, 2001, 2011
 Figures are for all India except Jammu and Kashmir for 1991, 2001, and 2011 since the 1991 census was not carried out in Jammu and Kashmir

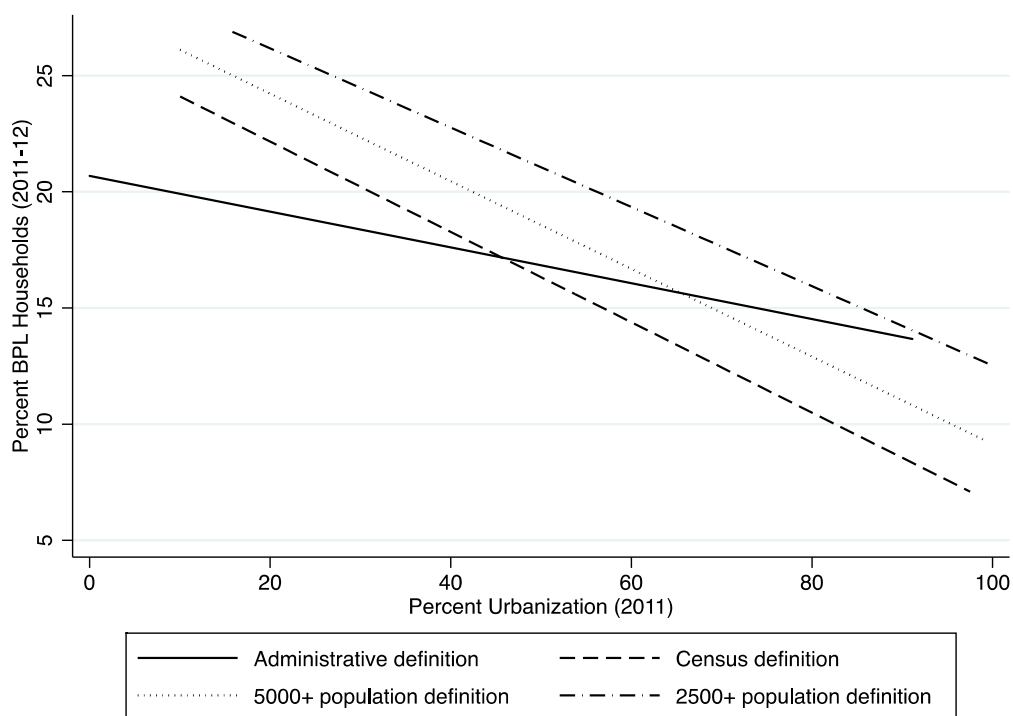
Table 2: Share of India's urban population to total population using different definitions				
	Administrative Definition	Census Definition	5000+ Pop Definition	2500+ Pop Definition
Urbanization rate	26%	31%	47%	65%

Table 3. Relationship between urbanisation and MGNREGS use			
	Total cumulative expenditure (per eligible person)	Expenditure on unskilled wages (per eligible person)	Persondays generated (per eligible person)
Proportion urban population by administrative definition <i>{lnprop_administrativeurbpop}</i>	0.00184 (0.00263) [R2=0.849]	0.00123 (0.00185) [R2=0.848]	0.460** (0.217) [R2=0.833]
Proportion urban population by census definition <i>{lnprop_censusurbpop}</i>	8.15E-05 (0.00306) [R2=0.849]	-0.00026 (0.00215) [R2=0.848]	0.274 (0.247) [R2=0.832]
Proportion urban population by 5000+ definition <i>{lnprop_5000urbpop}</i>	-0.00363 (0.00244) [R2=0.850]	-0.00305* (0.00178) [R2=0.849]	-0.301* (0.173) [R2=0.832]
Proportion urban population by 2500+ definition <i>{lnprop_2500urbpop}</i>	-0.00425* (0.00231) [R2=0.851]	-0.00350** (0.00169) [R2=0.850]	-0.440*** (0.158) [R2=0.833]
Notes: *** p<0.01, ** p<0.05, * p<0.1 Robust standard errors in () parentheses. For data sources see Appendix A. Regression results available in Appendix B.			

Table 4. Relationship between Rural inflation and MGNREGS use			
	Total cumulative expenditure (per eligible person)	Expenditure on unskilled wages (per eligible person)	Persondays generated (per eligible person)
Difference between proportion urban population by census definition and administrative definition <i>{diffce_prop_census_admin}</i>	-0.00451** (0.00217) [R2=0.850]	-0.00378** (0.00169) [R2=0.849]	-0.558*** (0.197) [R2=0.832]
Difference between proportion urban population by 5000+ definition and administrative definition <i>{diffce_prop_5000_admin}</i>	-0.00525*** (0.00146) [R2=0.852]	-0.00422*** (0.00106) [R2=0.851]	-0.638*** (0.141) [R2=0.836]
Difference between proportion urban population by 2500+ definition and administrative definition <i>{diffce_prop_2500_admin}</i>	-0.00381*** (0.0012) [R2=0.852]	-0.00303*** (0.000898) [R2=0.851]	-0.480*** (0.102) [R2=0.837]
Proportion of total settlements that are urban by census definition but rural by administrative definition <i>{ln_no_wrong_categ_if_censno}</i>	-0.00879** (0.00345) [R2=0.850]	-0.00764** (0.00302) [R2=0.849]	-0.992*** (0.383) [R2=0.832]
Proportion of total settlements that are urban by 5000+ definition but rural by administrative definition ^(a) <i>{ln_5000wronglyeligibleaspropsett}</i>	-0.0109*** (0.00241)	-0.00871*** (0.00176)	-1.244*** (0.237)
Proportion of total settlements that are rural by 5000+ definition but urban by administrative definition ^(b) <i>{ln_5000wronglydeniedaspropsettle}</i>	0.103 (0.216) [R2=0.852]	0.0728 (0.142) [R2=0.852]	-7.541 (7.5) [R2=0.837]
Proportion of total settlements that are urban by 2500+ definition but rural by administrative definition ^(c) <i>{ln_2500wronglyeligibleaspropsett}</i>	-0.00558*** (0.00149)	-0.00427*** (0.00113)	-0.655*** (0.143)
Proportion of total settlements that are rural by 2500+ definition but urban by administrative definition ^(d) <i>{ln_2500wronglydeniedaspropsettle}</i>	0.117 (0.209) [R2=0.852]	0.0544 (0.151) [R2=0.851]	-8.743 (15.05) [R2=0.836]
Notes: *** p<0.01, ** p<0.05, * p<0.1 Robust standard errors in () parentheses Variables a and b were used as independent variables in the same regression Variables c and d were used as independent variables in the same regression For data sources see Appendix A. Regression results available in Appendices C1, C2 and C3.			

Table 5. Relationship between urbanization and MGNREGS efficiency			
	Unmet demand ^(e)	Utilization of predicted persondays ^(f)	Funds utilization ^(g)
Proportion urban population by administrative definition <i>{lnprop_administrativeurbpop}</i>	0.252** (0.127) [R2=0.427]	-0.178* (0.0942) [R2=0.310]	0.0453 (0.107) [R2=0.442]
Proportion urban population by census definition <i>{lnprop_censusurbpop}</i>	0.306* (0.16) [R2=0.430]	-0.121 (0.108) [R2=0.308]	0.0593 (0.116) [R2=0.442]
Proportion urban population by 5000+ definition <i>{lnprop_5000urbpop}</i>	0.000682 (0.115) [R2=0.417]	-0.124 (0.11) [R2=0.309]	-0.011 (0.0734) [R2=0.442]
Proportion urban population by 2500+ definition <i>{lnprop_2500urbpop}</i>	-0.0241 (0.0853) [R2=0.418]	-0.0598 (0.0904) [R2=0.308]	0.0257 (0.0631) [R2=0.442]
Difference between proportion urban population by census definition and administrative definition <i>{diffce_prop_census_admin}</i>	0.0355 (0.123) [R2=0.417]	0.192* (0.103) [R2=0.309]	0.0233 (0.111) [R2=0.442]
Difference between proportion urban population by 5000+ definition and administrative definition <i>{diffce_prop_5000_admin}</i>	-0.144 (0.116) [R2=0.424]	-0.00418 (0.103) [R2=0.307]	-0.0506 (0.0599) [R2=0.443]
Difference between proportion urban population by 2500+ definition and administrative definition <i>{diffce_prop_2500_admin}</i>	-0.0843 (0.0567) [R2=0.421]	0.0287 (0.0625) [R2=0.307]	-0.00901 (0.0489) [R2=0.442]
Proportion of total settlements that are urban by census definition but rural by administrative definition <i>{ln_no_wrong_categ_if_censno}</i>	-0.102 (0.155) [R2=0.418]	-0.0119 (0.176) [R2=0.307]	-0.0761 (0.116) [R2=0.442]
Proportion of total settlements that are urban by 5000+ definition but rural by administrative definition ^(a) <i>{ln_5000wronglyeligibleaspropset}</i>	-0.0437 (0.0495)	-0.0626 (0.207)	-0.250** (0.107)
Proportion of total settlements that are rural by 5000+ definition but urban by administrative definition ^(b) <i>{ln_5000wronglydeniedaspropsettle}</i>	6.591 (5.724) [R2=0.424]	-0.598 (2.037) [R2=0.307]	-1.068 (1.875) [R2=0.445]
Proportion of total settlements that are urban by 2500+ definition but rural by administrative definition ^(c) <i>{ln_2500wronglyeligibleaspropset}</i>	0.0178 (0.0342)	0.0198 (0.104)	-0.112* (0.0658)
Proportion of total settlements that are rural by 2500+ definition but urban by administrative definition ^(d) <i>{ln_2500wronglydeniedaspropsettle}</i>	20.55 (21.08) [R2=0.439]	-0.307 (2.977) [R2=0.307]	-4.006 (4.16) [R2=0.444]
Notes: *** p<0.01, ** p<0.05, * p<0.1 Robust standard errors in ()parentheses Variables (a) and (b) were used as independent variables in the same regression. Variables (c) and (d) were used as independent variables in the same regression. (e): excluding districts in Andhra Pradesh and Daman & Diu and Upper Siang district of Arunachal Pradesh. (f): excluding districts in Arunachal Pradesh, Dadra & Nagar Haveli, Daman & Diu, Puducherry and Chandigarh .(g): excluding districts in Andhra Pradesh, Daman & Diu and Chandigarh For data sources see Appendix A. Regression results available in Appendices D1, D2, D3 and D4.			

Figure 1. Relationship between Poverty Rate and Urbanization in Indian States and UTs



BPL- Below Poverty Line using the Tendulkar methodology

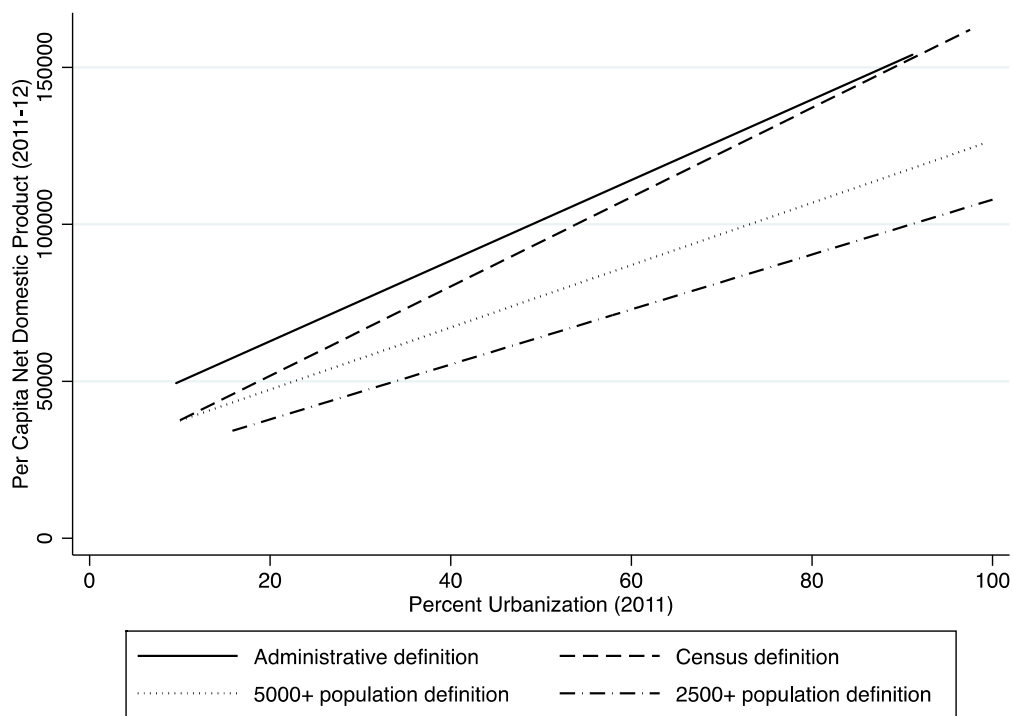
Administrative definition of urban- settlements governed by an urban local body

Census definition of urban- settlements governed by an urban local body and other settlements deemed urban by the Census

5000+ population definition of urban- settlements with over 5000 people

2500+ population definition of urban- settlements with over 2500 people

Figure 2. Relationship between Per Capita NSDP and Urbanization in Indian States and UTs



Administrative definition of urban- settlements governed by an urban local body

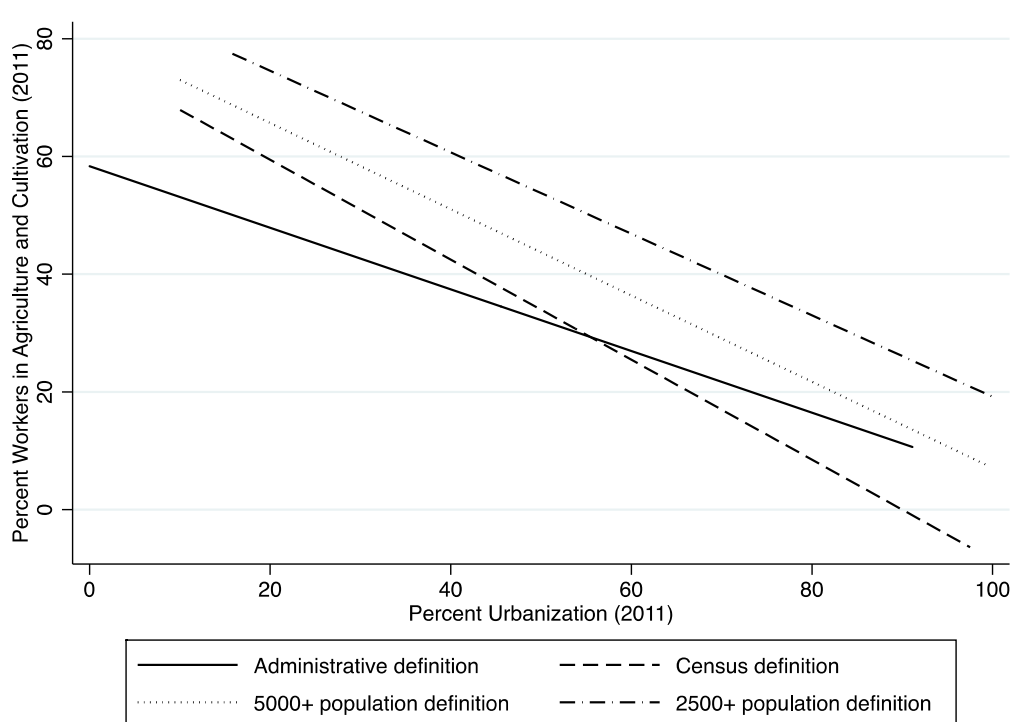
Census definition of urban- settlements governed by an urban local body and other settlements deemed urban by the Census

5000+ population definition of urban- settlements with over 5000 people

2500+ population definition of urban- settlements with over 2500 people

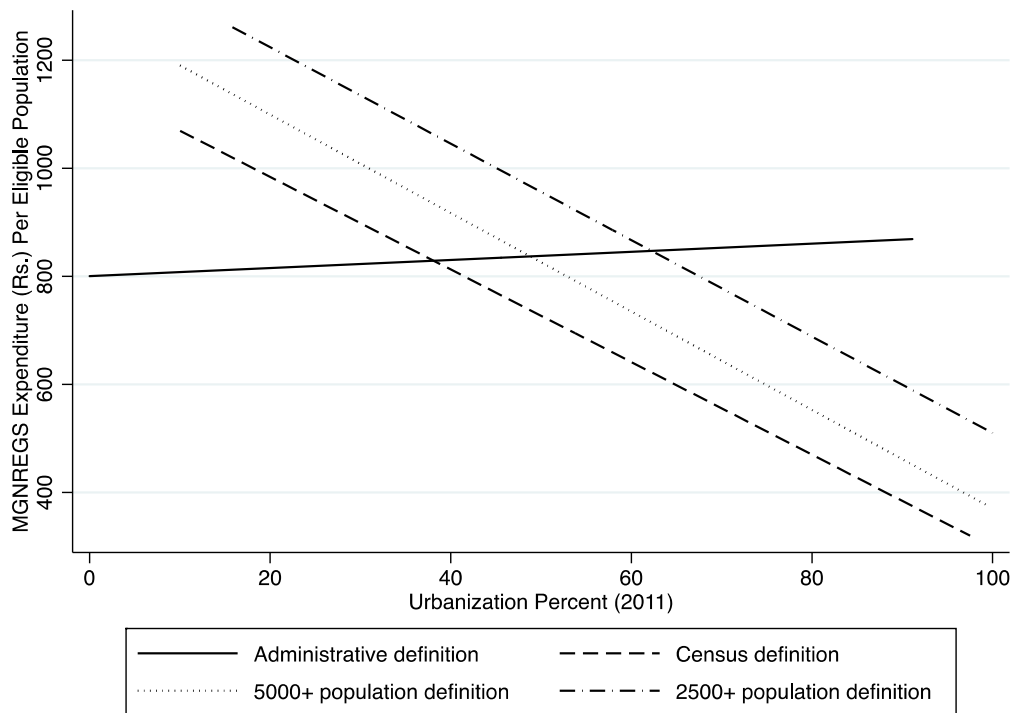
This graph excludes Dadra & Nagar Haveli, Daman & Diu, and Lakshadweep

Figure 3. Relationship between Workers in Agriculture and Cultivation and Urbanization in Indian States and UTs



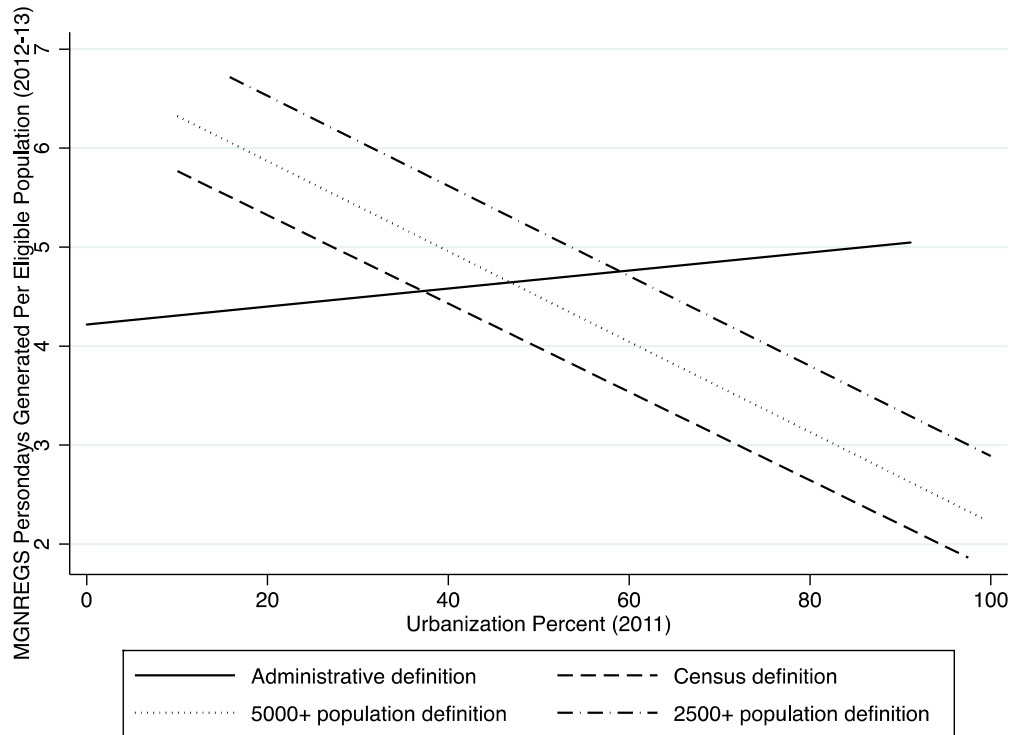
Administrative definition of urban- settlements governed by an urban local body
 Census definition of urban- settlements governed by an urban local body and other settlements deemed urban by the Census
 5000+ population definition of urban- settlements with over 5000 people
 2500+ population definition of urban- settlements with over 2500 people

Figure 4. Relationship between MGNREGS Expenditure and Urbanization in Indian States and UTs



Per Eligible Population- urban population when using the administrative definition
 Administrative definition of urban- settlements governed by an urban local body
 Census definition of urban- settlements governed by an urban local body and other settlements deemed urban by the Census
 5000+ population definition of urban- settlements with over 5000 people
 2500+ population definition of urban- settlements with over 2500 people

Figure 5. Relationship between MGNREGS Persondays Generated and Urbanization in Indian States and UTs



Per Eligible Population- urban population when using the administrative definition
 NREGS Persondays- number of days of work created under the scheme for beneficiaries

Administrative definition of urban- settlements governed by an urban local body
 Census definition of urban- settlements governed by an urban local body and other settlements deemed urban by the Census
 5000+ population definition of urban- settlements with over 5000 people
 2500+ population definition of urban- settlements with over 2500 people

Appendices

Appendix A. Description of Variables		
Variables	Description	Source
MGNREGS outcomes		
Inperadminrcap_totalcumexp*	Total MGNREGS expenditure	MGNREGS MIS Report 2012-13
Inperadminrcap_cumexp_unskilledw*	MGNREGS expenditure on unskilled wages per eligible population	MGNREGS MIS Report 2012-13
Inperadminrcap_persondaysgenerat*	Persondays generated under MGNREGS per eligible population	MGNREGS MIS Report 2012-13
In_unempt_allowpersondays*	Proportion of days for which unemployment allowance was payable to persondays generated	MGNREGS MIS Report 2012-13
Inprop_utilizn_lbpersondays*	Proportion of persondays generated to persondays projected in labour budget	MGNREGS MIS Report 2012-13
Inprop_utilizn_fundsavail*	Proportion of utilized funds to total available funds	MGNREGS MIS Report 2012-13
Urbanization Indicators		
Inprop_administrativeurbpop*	Proportion urban population as per administrative definition (that is, population living in settlements governed by ULBs)	Census of India 2011
Inprop_censusurbpop*	Proportion urban population as per census definition	Census of India 2011
Inprop_5000urbpop*	Proportion urban population using 5000+ population criterion as urban definition	Census of India 2011
Inprop_2500urbpop*	Proportion urban population using 2500+ population criterion as urban definition	Census of India 2011
diffce_prop_census_admin	Difference between proportion urban population by census definition and administrative definition	Census of India 2011
diffce_prop_5000_admin	Difference between proportion urban population by 5000+ population definition and administrative definition	Census of India 2011
diffce_prop_2500_admin	Difference between proportion urban population by 2500+ population definition and administrative definition	Census of India 2011
In_no_wrong_categ_if_censno*	Proportion of settlements categorized as urban by the census definition but not the administrative definition, to total settlements	Census of India 2011
In_5000wronglydeniedaspropsettle*	Proportion of settlements categorized as rural by the 5000+ population definition but not the administrative definition, to total settlements	Census of India 2011
In_5000wronglyeligibleaspropsett*	Proportion of settlements categorized as urban by the 5000+ population definition but not the administrative definition, to total settlements	Census of India 2011
In_2500wronglydeniedaspropsettle*	Proportion of settlements categorized as rural by the 2500+ population definition but not the administrative definition, to total settlements	Census of India 2011
In_2500wronglyeligibleaspropsett*	Proportion of settlements categorized as urban by the 2500+ population definition but not the administrative definition, to total settlements	Census of India 2011
State Dummy Variables		

bimaru	Dummy variable taking value 1 for 4 backward states in North India viz. Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh and 0 otherwise	
southernstate	Dummy variable taking value 1 for Southern states viz. Karnataka, Kerala, Tamil Nadu, and Andhra Pradesh and 0 otherwise	
ut	Dummy variable taking value 1 for Union Territories and 0 otherwise	
hillstates	Dummy variable taking value 1 for the North Eastern states, Jammu and Kashmir, Himachal Pradesh, and Uttarakhand and 0 otherwise	
District Development Indicators		
ln_literateprop*	Proportion of literate population to total population aged 7 years and above	Census of India 2011
ln_distmpc_mrp*	Average district monthly per capita expenditure using Mixed Reference Period	NSS 68th Round (2011-2012) Report
ln_propBPL*	Proportion of total population living below the poverty line by Tendulkar levels	NSS 68th Round (2011-2012) Report
ln_hhwithelecwaterprop*	Proportion of households with access to electricity, water source and latrine within premises	Census of India 2011
ln_luminosity_mean*	Mean luminosity	National Oceanic and Atmospheric Administration 2012
ln_labpartrateprop*	Proportion of main and marginal workers to total population	Census of India 2011
ln_propagrocultworkers*	Proportion of cultivators and agricultural labourers to total workers	Census of India 2011
ln_popdensity*	Persons per square kilometer	Census of India 2011
ln_proppopnonworkersseekingavail*	Proportion of non workers seeking or available for work to total population	Census of India 2011
ln_prophhwithnoassets*	Proportion of households with no assets specified by the Census	Census of India 2011
ln_prophhwithbankfac*	Proportion households with access to banking facilities	Census of India 2011
ln_propscstpop*	Proportion population belonging to SC/ST categories	Census of India 2011
Political Economy Characteristics		
electiondummy12131314	Dummy variable taking value 1 if there was an assembly election in the state during 2012-13 or 2013-14 and 0 otherwise	Election Commission of India
Congressruled	Dummy variable taking value 1 if state is ruled by a Congress Chief Minister between April 2012 and March 2013 for at least 6 months and 0 otherwise	
changeddistrict2011censumarch20	Dummy variable taking value 1 if the district underwent a change between 2011 and March 2012 and 0 otherwise	
Notes: Per eligible population refers to the total population of the district living in areas administered as rural.		
*Values in natural logs of (x +1)		

Appendix B. Relationship between MGNREGS Use and Proportion Urban Population

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Inperadminrcap_totalcumexp				Inperadminrcap_cumexp_unskilledw				Inperadminrcap_persondaysgenerat			
Inprop_administrativeurbpop	0.00184 (0.00263)				0.00123 (0.00185)				0.460** (0.217)			
Inprop_censusurbpop		8.15e-05 (0.00306)				-0.000260 (0.00215)				0.274 (0.247)		
Inprop_5000urbpop			-0.00363 (0.00244)				-0.00305* (0.00178)				-0.301* (0.173)	
Inprop_2500urbpop				-0.00425* (0.00231)				-0.00350** (0.00169)				-0.440*** (0.158)
Constant	-0.0156 (0.0135)	-0.0164 (0.0136)	-0.0171 (0.0137)	-0.0162 (0.0136)	-0.0124 (0.00969)	-0.0129 (0.00970)	-0.0135 (0.00979)	-0.0128 (0.00975)	-0.484 (1.522)	-0.663 (1.526)	-0.750 (1.527)	-0.673 (1.533)
Observations	624	624	624	624	624	624	624	624	624	624	624	624
R-squared	0.849	0.849	0.850	0.851	0.848	0.848	0.849	0.850	0.833	0.832	0.832	0.833

Note: The dependent variable in regressions 1-4 is the total MGREGS expenditure per eligible population (Inperadminrcap_totalcumexp). Dependent variable in regressions 5-8 is MGNREGS expenditure on unskilled wages per eligible population (Inperadminrcap_cumexp_unskilledw). Dependent variable in regressions 9-12 is persondays generated under MGNREGS per eligible population (Inperadminrcap_persondaysgenerat). All regressions control for state dummy variables, district development indicators and political economy characteristics (as explained in appendix A). They also control for state fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix C1. Relationship between Total Cumulative Expenditure and Rural Inflation

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Inperadminrcap_totalcumexp					
diffce_prop_census_admin	-0.00451** (0.00217)					
diffce_prop_5000_admin		-0.00525*** (0.00146)				
diffce_prop_2500_admin			-0.00381*** (0.00120)			
ln_no_wrong_categ_if_censno				-0.00879** (0.00345)		
ln_5000wronglydeniedaspropsettle					0.103 (-0.216)	
ln_2500wronglydeniedaspropsettle						0.117 (0.209)
ln_5000wronglyeligibleaspropsett					-0.0109*** (-0.00241)	
ln_2500wronglyeligibleaspropsett						-0.00558*** (0.00149)
Constant	(0.00118) -0.0144 (0.0135)	(0.00117) -0.0146 (0.0136)	(0.00117) -0.0138 (0.0135)	(0.00118) -0.0142 (0.0135)	(-0.00116) -0.0172 (-0.0136)	(0.00116) -0.0164 (0.0135)
Observations	624	624	624	624	624	624
R-squared	0.850	0.852	0.852	0.850	0.852	0.852

Note: The dependent variable in regressions 1-6 is the total MGREGS expenditure per eligible population (Inperadminrcap_totalcumexp). All regressions control for state dummy variables, district development indicators and political economy characteristics (as explained in appendix A). They also control for state fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix C2. Relationship between Cumulative Expenditures on Unskilled Wages and Rural Inflation

	(7)	(8)	(9)	(10)	(11)	(12)
VARIABLES	lnperadminrcap_cumexp_unskilledw					
diffce_prop_census_admin	-0.00378** (0.00169)					
diffce_prop_5000_admin		-0.00422*** (0.00106)				
diffce_prop_2500_admin			-0.00303*** (0.000898)			
ln_no_wrong_catg_if_censno				-0.00764** (0.00302)		
ln_5000wronglydeniedaspropsettle					0.0728 (0.142)	
ln_2500wronglydeniedaspropsettle						0.0544 (0.151)
ln_5000wronglyeligibleaspropsett					-0.00871*** (0.00176)	
ln_2500wronglyeligibleaspropsett						-0.00427*** (0.00113)
Constant	-0.0112 (0.00950)	-0.0115 (0.00967)	-0.0108 (0.00960)	-0.0110 (0.00947)	-0.0135 (0.00955)	-0.0129 (0.00961)
Observations	624	624	624	624	624	624
R-squared	0.849	0.851	0.851	0.849	0.852	0.851

Note: The dependent variable in regressions 7-12 is the MGNREGS expenditure on unskilled wages per eligible population (lnperadminrcap_cumexp_unskilledw). All regressions control for state dummy variables, district development indicators and political economy characteristics (as explained in appendix A). They also control for state fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix C3. Relationship between Persondays Generated and Rural Inflation

VARIABLES	(13)	(14)	(15)	(16)	(17)	(18)
	Inperadminrcap_persondavsgenerat					
diffce_prop_census_admin	-0.558*** (0.197)					
diffce_prop_5000_admin		-0.638*** (0.141)				
diffce_prop_2500_admin			-0.480*** (0.102)			
ln_no_wrong_categ_if_censno				-0.992*** (0.383)		
ln_5000wronglydeniedaspropsettle					-7.541 (7.500)	
ln_2500wronglydeniedaspropsettle						-8.743 (15.05)
n_5000wronglyeligibleaspropsett					-1.244*** (0.237)	
ln_2500wronglyeligibleaspropsett						-0.655*** (0.143)
Constant	-0.436 (1.516)	-0.471 (1.540)	-0.356 (1.531)	-0.436 (1.524)	-0.669 (1.485)	-0.670 (1.491)
Observations	624	624	624	624	624	624
R-squared	0.832	0.836	0.837	0.832	0.837	0.836

Note: The dependent variable in regressions 13-18 is the persondays generated under MGNREGS per eligible population (Inperadminrcap_persondavsgenerat). All regressions control for state dummy variables, district development indicators and political economy characteristics (as explained in appendix A). They also control for state fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix D1. Relationship between Efficiency of MGNREGS and Proportion Urban Population

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ln_unempt_allowpersondays				lnprop_utilizn_lbpersondays				lnprop_utilizn_fundsavail			
lnprop_administrativeurbpop	0.252** (0.127)				-0.178* (0.0942)				0.0453 (0.107)			
lnprop_censusurbpop		0.306* (0.160)				-0.121 (0.108)				0.0593 (0.116)		
lnprop_5000urbpop			0.000682 (0.115)				-0.124 (0.110)					-0.0110 (0.0734)
lnprop_2500urbpop				-0.0241 (0.0853)				-0.0598 (0.0904)				0.0257 (0.0631)
Constant	0.343 (1.204)	0.239 (1.188)	0.232 (1.192)	0.234 (1.212)	0.188 (0.684)	0.266 (0.685)	0.260 (0.684)	0.280 (0.686)	0.224 (0.640)	0.216 (0.642)	0.200 (0.637)	0.205 (0.641)
Observations	599	599	599	599	602	602	602	602	599	599	599	599
R-squared	0.427	0.430	0.417	0.418	0.310	0.308	0.309	0.308	0.442	0.442	0.442	0.442

Note: The dependent variable in regressions 1-4 is proportion of days for which unemployment allowance was payable to persondays generated (ln_unempt_allowpersondays). Dependent variable in regressions 5-8 is proportion of persondays generated to persondays projected in labour budget (lnprop_utilizn_lbpersondays). Dependent variable in regressions 9-12 is proportion of utilized funds to total available funds (lnprop_utilizn_fundsavail). All regressions control for state dummy variables, district development indicators and political economy characteristics (as explained in appendix A). They also control for state fixed effects. For ln_unempt_allowpersondays we drop districts in Andhra Pradesh, Daman & Diu, and Upper Siang district of Arunachal Pradesh. For lnprop_utilizn_lbpersondays we drop districts in Arunachal Pradesh, Dadra & Nagar Haveli, Daman & Diu, Puducherry, and Chandigarh. For lnprop_utilizn_fundsavail we drop districts in Andhra Pradesh, Daman & Diu, and Chandigarh. This is because of missing values. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix D2. Relationship between Unmet Demand and Rural Inflation

VARIABLES	13	14	15	16	17	18
	ln unempt allowpersondays					
diffce_prop_census_admin	0.0355 (0.123)					
diffce_prop_5000_admin		-0.144 (0.116)				
diffce_prop_2500_admin			-0.0843 (0.0567)			
ln_no_wrong_catg_if_censno				-0.102 (0.155)		
ln_5000wronglydeniedaspropsettle					6.591 (5.724)	
ln_2500wronglydeniedaspropsettle						20.55 (21.08)
ln_5000wronglyeligibleaspropsett					-0.0437 (0.0495)	
ln_2500wronglyeligibleaspropsett						0.0178 (0.0342)
Constant	(0.0113) 0.212 (1.253)	(0.0112) 0.299 (1.237)	(0.0119) 0.301 (1.235)	(0.0112) 0.262 (1.236)	(0.0111) 0.197 (1.165)	(0.0107) 0.224 (1.145)
Observations	599	599	599	599	599	599
R-squared	0.417	0.424	0.421	0.418	0.424	0.439

Note: The dependent variable in regressions 13-18 is the proportion of days for which unemployment allowance was payable to persondays generated (ln_unempt_allowpersondays). All regressions control for state dummy variables, district development indicators and political economy characteristics (as explained in appendix A). They also control for state fixed effects. For ln_unempt_allowpersonday we drop districts in Andhra Pradesh, Daman & Diu, and Upper Siang district of Arunachal Pradesh. This is because of missing values. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix D3. Relationship between Utilization of Predicted Persondays Generated and Rural Inflation

VARIABLES	(19)	(20)	(21)	(22)	(23)	(24)
	Inprop_utilizn_lbpersondays					
diffce_prop_census_admin	0.192*					
	(0.103)					
diffce_prop_5000_admin		-0.00418				
		(0.103)				
diffce_prop_2500_admin			0.0287			
			(0.0625)			
ln_no_wrong_categ_if_censno				-0.0119		
				(0.176)		
ln_5000wronglydeniedaspropsettle					-0.598	
					(2.037)	
ln_2500wronglydeniedaspropsettle						-0.307
						(2.977)
ln_5000wronglyeligibleaspropsett					-0.0626	
					(0.207)	
ln_2500wronglyeligibleaspropsett						0.0198
						(0.104)
Constant	0.160	0.270	0.242	0.272	0.263	0.268
	(0.692)	(0.690)	(0.691)	(0.692)	(0.684)	(0.685)
Observations	602	602	602	602	602	602
R-squared	0.309	0.307	0.307	0.307	0.307	0.307

Note: The dependent variable in regressions 19-24 is the proportion of persondays generated to persondays projected in labour budget (Inprop_utilizn_lbpersondays). All regressions control for state dummy variables, district development indicators and political economy characteristics (as explained in appendix A). They also control for state fixed effects. For Inprop_utilizn_lbpersondays we drop districts in Arunachal Pradesh, Dadra & Nagar Haveli, Daman & Diu, Puducherry, and Chandigarh. This is because of missing values. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.

Appendix D4. Relationship between Funds Utilization and Rural Inflation

	(25)	(26)	(27)	(28)	(29)	(30)
VARIABLES	Inprop_utilizn_fundsavail					
diffce_prop_census_admin	0.0233 (0.111)					
diffce_prop_5000_admin		-0.0506 (0.0599)				
diffce_prop_2500_admin			-0.00901 (0.0489)			
ln_no_wrong_categ_if_censno				-0.0761 (0.116)		
ln_5000wronglydeniedaspropsettle					-1.068 (1.875)	
ln_2500wronglydeniedaspropsettle						-4.006 (4.160)
ln_5000wronglyeligibleaspropsettle					-0.250** (0.107)	
ln_2500wronglyeligibleaspropsettle						-0.112* (0.0658)
Constant	0.196 (0.643)	0.215 (0.645)	0.208 (0.643)	0.217 (0.643)	0.188 (0.639)	0.190 (0.638)
Observations	599	599	599	599	599	599
R-squared	0.442	0.443	0.442	0.442	0.445	0.444

Note: The dependent variable in regressions 25-30 is the proportion of utilized funds to total available funds (Inprop_utilizn_lpersondays) All regressions control for state dummy variables, district development indicators and political economy characteristics (as explained in appendix A). They also control for state fixed effects. For Inprop_utilizn_fundsavail we drop districts in Andhra Pradesh, Daman & Diu, and Chandigarh because of missing values. The variable for UT is dropped due to multicollinearity. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.