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Need, Merit, and Politics in Multilateral Aid Allocation: A District-Level Analysis of World Bank Projects in India*

Peter Nunnenkamp, Hannes Öhler and Maximiliano Sosa Andrés

Abstract:
The targeting of foreign aid within recipient countries is largely unexplored territory. We help close this gap in empirical research on aid allocation by employing Poisson estimations on the determinants of the World Bank's choice of project locations at the district level in India. The evidence of needs-based location choices is very weak, even though World Bank activities tend to concentrate in relatively remote districts. Spatial lags prove to be significant and positive pointing to regional clustering. Institutional conditions matter insofar as project locations cluster in districts belonging to states with greater openness to trade. We do not find any evidence that location choices are affected by political patronage at the state or district level. However, the World Bank prefers districts where foreign direct investors may benefit from projects related to infrastructure.

Keywords: aid allocation, World Bank, Indian districts, political constituency.

JEL classification: F35, F53

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In 1990 more than nine out of ten of the world's poorest … lived in poor countries. Now, three quarters live in middle-income states such as China, India and Brazil. This is a problem for the World Bank because it mostly still lends to poor countries, not poor people.

The Economist, April 21st, 2012

1. Introduction

Donors have often been criticized for insufficient targeting of foreign aid. In particular, donor selectivity in terms of favouring needy and deserving recipients appears to be weak according to earlier studies such as Alesina and Dollar (2000) and Alesina and Weder (2002).[1] The typical defence line of donors is that essentially all empirical studies assess aid allocation across countries. The highly aggregate level of recipient countries may disguise that poverty affects large segments of the population within countries whose average income level is well above subsistence levels. Furthermore, the quality of governance may differ within countries so that some local administrations may put aid to productive use, whereas other local administrations do not merit aid.

The geography of foreign aid within recipient countries is largely unexplored territory.[2] Donors typically do not reveal the precise location of their aid projects. However, AidData in collaboration with the World Bank provides a project- and location-specific

[1] Several recent studies stress the differences between donors. While some donors allocate aid altruistically according to recipients' need and merit, other donors behave egoistically and use aid as a means to promote their own commercial and political interest (e.g., Berthélemy 2006; Dollar and Levin 2006; Thiele et al. 2007; Claessens et al. 2009). Fleck and Kilby (2010) find that the United States placed less emphasis on need for core aid recipients during the War on Terror.

[2] Zhang (2004) provides an exception by assessing the allocation of World Bank projects across Chinese provinces. Specifically, Zhang presents OLS regression results based on about 30 provincial observations for the amount of World Bank loans and five possible determinants, including the population and per-capita income of provinces.

database covering on-going projects in various recipient countries.[3] We combine the project-related information offered by AidData with the exceptionally rich data reflecting economic, institutional and political conditions available for 620 districts in 28 Indian states and seven Union territories.[4] The case of India is particularly relevant to assess the within-country allocation of aid. The vast country is characterized by striking regional disparities which should have affected the location of aid projects. India is currently classified as a lower-middle income country by the World Bank and has traditionally been among the major recipients of foreign aid. As a so-called blend country, India is eligible for highly concessional funding by the International Development Agency (IDA) as well as for IBRD loans.[5] In 2006-2010, IDA directed almost 14 per cent of its overall aid commitments to India, the highest share among all recipient countries. Conversely, IDA ranked second (behind Japan) among India's donors of official development assistance (ODA), contributing 30 per cent to ODA commitments from all sources in 2006-2010. IBRD loans to India, which are subsumed under other official flows (rather than ODA), amounted to US$12 billion during the same period, making the country the third largest IBRD borrower behind Mexico and Brazil.[6]

By analysing the location of World Bank projects within India we extend the aid allocation literature in several ways. First of all, we account for need and merit at the regional level to overcome the limitations of cross-country studies. Wide income gaps prevail within India. Average per-capita income in Bihar was just one fifth of average per-capita income in Maharashtra in 2005/06 and the following years. At the same time, average per-capita income in the three richest districts of Maharashtra was about three times as high as average per-capita income in the three poorest districts of the same state. Likewise, there are striking

[3] The link to the database is as follows: http://open.aiddata.org/content/index/geocoding (accessed: February 2012).
[4] There are data gaps in several respects, however. Consequently, we miss districts in most Union territories and some small states; see below for details. Note also that we do not cover some 30 districts that were created only recently.
[5] See: http://data.worldbank.org/about/country-classifications (accessed: February 2012).
[6] For details, see: http://stats.oecd.org/index.aspx?DataSetCode=CRS1 (accessed: February 2012).

regional differences with regard to governance and stability. Kerala experienced close to 200 riots per million inhabitants in 2006, compared to essentially zero in Punjab.[7] The frequency of riots within Karnataka varied by a factor of four between the districts of Dakshin (South) Kannada and Uttara (North) Kannada. Hence, our first objective is to assess whether the World Bank adhered to its own insights – according to which aid tends to be more effective in poor environments with better governance (World Bank 1998) – when distributing its projects within India.

Another contribution is that we take spatial considerations into account. We assess whether World Bank projects tend to cluster regionally, either through previous projects encouraging further projects in the same district or through spatial effects, i.e., neighbouring project locations affecting one another. Spatial effects may be expected particularly if poverty and governance conditions are similar in neighbouring districts. At the same time, regional bodies within India may compete for World Bank projects.

We also aim at evaluating the impact of political factors at the state and district level on the location of World Bank projects. Arguably, the distribution of World Bank assistance within India "has been strongly conditioned by states' political clout with the central government, owing to their ruling parties' ties to the central coalition" (Kirk 2005: 287). On the other hand, the World Bank may have circumvented the meddling of the federal government by its "strategy of 'focus states' lending in India, targeting state-level governments for wide-ranging policy reforms meant to promote economic growth and poverty reduction" (ibid). Political factors may bias the distribution of projects not only at the state level. Furthermore, Chief Ministers of states may direct projects primarily towards their own constituencies and home districts. For instance, the Chief Minister of Uttar Pradesh in 2007-

[7] See the dataset on crime in India of the Center for Systemic Peace available at: http://www.systemicpeace.org/inscr/inscr.htm (accessed: February 2012). More recent data on riots are not available from this source.

2012, Kumari Mayawati, distanced herself from her predecessor by declaring: "I am not Mr. Mulayam Singh Yadav, who had diverted all the funds to develop his home area only."[8]

In addition to political interference in India, we assess at least tentatively whether the allocation of projects is affected by commercial interests of the World Bank's major shareholders. This could be the case if projects were mainly directed to locations preferred by foreign investors and traders. Several studies suggest that multilateral institutions are vulnerable to pressure of major shareholders. Dreher et al. (2009b: 742) find that loans from the International Monetary Fund are "a mechanism by which the major shareholders of the Fund can win favour with voting members of the [United Nations] Security Council." Likewise, World Bank projects have been directed by major shareholders and funnelled to politically important developing countries (Dreher et al. 2009a). According to Fleck and Kilby (2006), the United States influences World Bank lending in pursuit of US commercial (and strategic) interests.[9] Pressure of shareholders may also affect the within-country allocation of World Bank projects, notably when specific regions are of particular commercial interest.

To preview our major results, the evidence of needs-based location choices across Indian districts by the World Bank is very weak, even though projects tend to concentrate in relatively remote districts. Institutional conditions matter insofar as project locations cluster in districts belonging to states with greater openness to trade. We do not find any evidence that location choices are affected by political patronage at the state or district level. However, the World Bank prefers districts where foreign direct investors may benefit from projects related to infrastructure.

2. Method and data

[8] See: http://bspindia.org/kumari-mayawati.php (accessed: February 2012).
[9] Kilby (2009) finds that US pressure has undermined the World Bank's conditionality in structural adjustment programs with countries that are politically friendly with the United States.

The geocoded database of World Bank projects by AidData on which we draw for the subsequent analysis lists 86 projects in India that were approved in 2006 or later and were still in operation in September 2011. Taken together these projects involve World Bank commitments in India in the order of US$ 21 billion during the period 2006-2011. Some projects are small and limited to few locations within a single Indian state. For instance, the World Bank committed US$ 13.6 million in 2009 for a project in energy and mining that was located in two districts of Karnataka. At the other extreme, one project in transportation involves overall commitments of US$ 1.5 billion, spreading over some 200 locations in seven states. Appendix A shows the sectoral breakdown of overall World Bank commitments. The focus is clearly on infrastructure, notably transportation and energy (including mining), while social services such as education and health play a minor role.

The database does not provide the regional breakdown of the overall amount of project-related World Bank commitments. However, the entries in the database typically specify the districts in which (part of) a project is located.[10] Appendix B shows how these entries are distributed across Indian states. Not surprisingly, the larger states typically rank high in terms of the absolute number of project locations in 2006-2011. By contrast, some small Union territories (Lakshadweep, Andaman and Nicobar, Daman and Diu) stand out when comparing project locations per million of inhabitants. Importantly, the simple correlation between project locations per million of inhabitants and the average per-capita income at the state level is essentially zero (not shown), casting into doubt that the location of World Bank projects is strongly poverty-related.

Against this backdrop, we opt for Poisson Pseudo Maximum Likelihood (PPML) estimations to assess the determinants of the number of World Bank's project locations at the

[10] The database has 1638 entries for projects approved since 2006. No specific districts are given for 258 of these entries. For most of these 258 entries, relating to 31 projects, the location given in the database refers to the so-called first order administrative division (ADM1, i.e., the state in India), but the location within the ADM1 is unknown. In some cases, the location is an entire state or lies between populated areas, along rivers or borders, etc. We also omit a single project location in Delhi.

district level. Poisson regression models are generally appropriate when the dependent variable takes non-negative values and is skewed.[11] The expected number of project locations is given by:

$$E\left(y_i \mid x_i\right) = e^{x_i'\beta}$$

As described below our independent variables include both district- and state-level variables. To avoid underestimating the standard errors of state-level variables we cluster them by state.

In the basic Poisson model, the dependent variable is defined as the number of project locations within one particular Indian district for all World Bank projects approved during the period 2006-2011. The sample of World Bank projects tends to be tilted increasingly towards longer-term projects the further one goes back in time by including projects approved in earlier years. This is why we focus on recent years, i.e., projects approved in 2006-2011.[12] The cross-section approach appears appropriate to avoid an excess of zeros. Nevertheless, we perform two sets of panel data analyses in subsequent steps in order to test for the robustness of our results. First, we slice the project data by the year of approval. The dependent variable is then defined as the number of project locations for World Bank projects approved in year *t* (*t* = 2006, …, 2011). Second, we consider the number of project-specific locations within a district; i.e., we replace the time dimension by the finer project dimension. Note that the number of zero observations increases substantially when defining the dependent variable along the project dimension.

In both the cross section analysis and the panel data analysis we perform two sets of estimations. The first set includes district- and state-level determinants of location choices.[13] The second set includes district-level determinants with state fixed effects to fully control for unobserved heterogeneity at the state level. District-level indicators of need and merit are as

[11] Note also that the PPML estimator allows for over- and under-dispersion, i.e., the conditional variance of the dependent variable does not have to be equal to the conditional mean (see e.g., Santos Silva and Tenreyro 2006).
[12] All the same, we perform a robustness test below by considering all World Bank projects approved since 2001.
[13] See Appendix C for a detailed definition of all variables and data sources; Appendix D provides summary statistics.

follows. GDP per-capita at the district level in 2005/06 represents our indicator of need. This information is available from the Planning Commission for 24 states.[14] Merit is typically captured by the quality of institutions and governance in aid allocation studies (e.g. Berthélemy 2006; Dollar and Levine 2006). While information on institutional conditions is limited for relatively small regional units such as Indian districts, we consider the frequency of riots and social unrest (per 100,000 inhabitants) as a proxy for the quality of institutions at the district level. This information is drawn from Marshall and Marshall (2008).

To account for possible political patronage at the district level, we identified the political constituencies of the Chief Ministers of state governments. Political patronage at the district level would imply that the chances of districts receiving World Bank projects are higher when the Chief Minister has her constituency there. Hence, we set a dummy variable equal to one for districts where the Chief Minister had her constituency.[15]

We also account for the number of FDI projects in Indian districts, approved in the post-reform period 1991-2005. One would expect World Bank projects to locate in districts with (more) FDI projects if aid activities of the World Bank in India serve the commercial interests of its major shareholders, notably by improving local infrastructure that, in turn, supports the profitability of FDI.[16] In addition, we control for several factors at the district level. First of all, larger districts (in terms of population) are expected to attract a larger number of project locations. Second, we assess whether World Bank projects are concentrated in remote districts. This could provide an indirect indication of needs-based aid allocation, assuming that districts further away from economic centres are characterized by more serious

[14] See: http://planningcommission.nic.in/plans/stateplan/index.php?state=ssphdbody.htm (accessed February 2012). This source does not cover six Union territories, Gujarat, and some small states such as Goa, Nagaland, and Tripura. Therefore, we also experimented with an alternative indicator of need drawn from the Indian Census by interpolating data of 2001 and 2011 on district-level literacy rates. However, literacy proved to be irrelevant throughout at conventional levels of significance so that we do not report detailed results. The poor results for literacy rates are probably because social services such as education and health play a minor role in the World Bank's project portfolio in India (see Appendix A).

[15] More precisely, the variable may vary between zero and one to account for the possibility that the Chief Minister has her constituency in the district for only part of the period of observation (with the proportion on months used as weights).

[16] See Zhang 2004 for a similar reasoning on World Bank activity in China.

bottlenecks to economic and social development. Alternatively, the World Bank may be reluctant to engage in remote areas where the visibility of projects is more limited. Planting its flag in less remote and, thus, easier locations may also be tempting for the World Bank in order to impress its shareholders with successful project implementation. Remoteness is measured as the minimum travel time, based on a cost distance analysis, from a district to any of the ten most important economic centres in the country.[17] Third, we include a dummy variable set equal to one for districts affected by the Asian tsunami in December 2004.[18] We assume that the impact of the tsunami in western and southern districts of India on the location of World Bank projects is minimized by restricting the analysis to projects approved since 2006. Nonetheless, we control for tsunami effects as the approval of related projects could have been delayed. Fourth, we control for the number of projects that a specific district received in previous years (2001-2005).[19] A positive coefficient of this variable may point to clustering of World Bank projects at the district level.

In extended specifications, we account for the spatial lag of the dependent variable. Rather than considering only neighbours with a common border, we also account for project locations in districts without a common border. Technically speaking, we apply a row-standardized inverse distance matrix based on distances between Indian districts as our weighting matrix.[20] However, Poisson estimations augmented by spatial lags may be biased due to the endogeneity of spatial lags which tend to be determined simultaneously with project locations in the district under consideration. Therefore, we also present spatial autoregressive models with spatial autoregressive disturbances (SARAR models) estimated by general spatial two-stage least squares (GS2SLS) proposed by Kelejian and Prucha (1998):

[17] Delhi, Mumbai, Ahmedabad, Bangalore, Chennai, Hyderabad, Kolkata, Patna, Bhubaneswar and Guwahati. We thank Henry Edward Jewell and Hyoung Gun Wang of the World Bank's Finance, Economics and Urban Department who developed this measure, as well as Uwe Deichmann who helped us access these data.

[18] The relevant information is taken from maps revealing the affected districts; see: http://www.mapsofindia.com/maps/tsunami-in-india/tsunami-affected-area-india.html.

[19] These projects, too, were still active as of September 2011.

[20] We use the average distance between districts in neighbouring states as the cut-off distance, i.e., we neglect districts which are further than 489 kilometres away from the district under consideration and set the respective weights to zero.

$$y = \gamma Wy + X\beta + u$$

$$u = \rho Wu + \varepsilon$$

where Wy is known as the spatial lag with W being the row-standardized inverse distance matrix, X the exogenous regressors, u an disturbance term which may depend on a weighted average of other disturbances and ε an independent but heteroskedastically distributed error term. The method uses WX and W^2X as instruments.[21]

While the list of variables at the state level covers similar aspects, we expect deeper insights in two major respects. Compared to the district level, better information is available at the state level with respect to institutional and economic policy conditions. We consider the degree of economic freedom across states, based on an aggregated score rating the size of government, legal structure and property rights, access to sound money, freedom to trade internationally and labour and business regulations.[22] Economic policy conditions are also captured by openness to trade at the state level.[23] This measure relates to the World Bank's view on aid effectiveness, according to which openness to trade represents an essential element of good policy conditions for aid to be effective (e.g., Burnside and Dollar 2000).

Finally, as concerns possible political patronage at the state level, we introduce two dummy variables. The first variable is set equal to one for districts located in states where the Chief Minister belongs to the same political party as the Prime Minister at the federal level. Similarly, the second variable takes a value of one if the Chief Minister belongs to a party in coalition at the federal level. In this way, we account for the possibility that the chances of districts receiving World Bank projects may increase when the same party is in power at the

[21] We use Drukker et al.'s (2011) spreg command in Stata for the estimations. See the same paper for more details on the method. Note that the model cannot account for the count nature of our dependent variable and for standard errors to be clustered by state.
[22] The score is based on the Fraser Institute's *Economic Freedom of the World* ranking. See Debroy et.al. (2011).
[23] More precisely, we use export data for so-called export-oriented units; for details, see: http://www.eouindia.gov.in/fact_figure09.htm#005.

state and federal levels. As noted before, the political clout of state authorities at the federal level has been suspected to matter for World Bank decisions (Kirk 2005).[24]

3. Results

Cross section results

The Poisson estimations reported in Table 1 employ the number of project locations at the district level as the dependent variable. We consider all World Bank projects that were approved since 2006 and still in operation by September 2011. Recall from above that one particular project may spread over several locations within a district, for instance, in the case of large projects covering roads and other infrastructure in several smaller administrative units. As independent variables we enter both district- and state-level factors that could have an impact on location choices for the World Bank projects.[25] The basic specifications in columns I and II include population as well as indicators of need (*log per capita GDP, tsunami*) and merit (*riots*) at the district level, institutional conditions (*trade openness* or *economic freedom*) at the state level, and our proxies for possible political patronage at the level of districts (*Chief Minister constituency*) and states (*same party* and *coalition*). In columns III-VI of Table 1, we extend the list of independent variables at both the district and state level.

The baseline estimations suggest that location choices were not affected by need and merit at the district level. The only exception is the significantly positive tsunami dummy in column II, indicating a higher number of project locations in districts affected by the tsunami in December 2004. However, the tsunami dummy is no longer significant in the subsequent

[24] Constitutional controls over state borrowing position the centre as the legal borrower that is ultimately responsible for repaying the World Bank's dollar-denominated loans. Consequently, the World Bank needs the federal government's "explicit cooperation" (Kirk 2005: 289) for its state-focused lending. Similar to the Chief Minister's constituency at the district level, we use a weighting scheme based on the proportion of months during the period of observation for the two indicators of political patronage at the state level. Accordingly, these two indicators may also vary between zero and one.

[25] As discussed in more detail below, we replace state-level determinants by state-fixed effects in the next step of our analysis.

estimations. Population is the only variable at the district level that proves to be consistently significant, at the one per cent level, implying that larger districts are typically characterized by more project locations.

The insignificance of the frequency of riots at the district level does not necessarily mean that merit does not play any role for the location of World Bank projects. Rather, column II provides some evidence that World Bank projects tend to locate in districts belonging to Indian states with a better institutional and economic environment. The number of locations significantly increases, at the ten per cent level, for districts in states with greater openness to trade. Economic freedom turns out to be insignificant, however.[26] At the same time, we do not find any evidence suggesting that the location of World Bank projects is affected by political patronage. The insignificant coefficients of our proxies for political affinity of state governments with the federal government in Delhi speak against patronage in favour of political allies at the state level. It rather appears that the World Bank succeeded in limiting meddling by the federal government and dealt with state governments directly, e.g., in the context of its strategy of 'focus states' lending (Kirk 2005). Likewise, districts did not benefit, in terms of more project locations, from the Chief Minister having her political constituency there. This surprising finding may be attributed to the fact that the dependent variable covers six years of project approvals, a period during which Chief Ministers changed several times in some Indian states. It is also possible, however, that political patronage plays a minor role at the district level as various large World Bank projects spread across several districts almost by construction.

The results reported so far are fairly robust when extending the specification. The most notable exception refers to GDP per capita at the district level. While the coefficient of GDP per capita continues to be statistically insignificant in columns III-V, it turns out to be

[26] Recall that indicators of economic freedom and openness to trade are not available at the district level.

significantly negative, at the ten per cent level, in the fully specified model in column VI. We return to the question of the needs-based allocation of World Bank projects further below.

The extensions in columns III-V mainly concern aspects of remoteness and agglomeration at the district level. The remoteness of districts, measured by (logged) minimum travel time from districts to the closest economic centre in India, may reflect greater regional need for World Bank projects (see Section 2). It could thus be taken as an indication of needs-based aid allocation if the number of project locations rises with distance. On the other hand, one may suspect that World Bank projects locate mainly where foreign direct investors have an interest in improved infrastructure, i.e., where the number of FDI projects is high. In that case location choices might be driven by the demands of foreign investors, rather than regional needs. The remoteness of districts always fails to pass conventional levels of significance, whereas the number of FDI projects proves to be significant and positive in the fully specified model in column VI. This indicates that World Bank support, in terms of the number of project locations, responds favourably to existing clusters of FDI projects.[27]

The fully specified model accounts for GDP per capita, population and the frequency of riots and unrest at both the district and state level, in addition to previous extensions. The results reported in column VI indicate that the location of World Bank projects is influenced by conditions at both levels, though not necessarily by the same factors and in the same direction.[28] For instance, projects tend to cluster in larger districts, but districts are typically penalized if they are located in larger states. This indicates a "small state bias" similar to the small country bias found in the cross-country aid allocation literature (e.g., Berthélemy and Tichit 2004). Need as reflected in GDP per capita does not play any role for location choices at the state level, while we find some weak evidence of a needs-based allocation at the district level. By contrast, it appears that merit shapes location choices at the state level: greater

[27] We also add the number of project locations in districts that relate to earlier World Bank projects (approved in 2001-2005). However, this variable proves to be insignificant. See also the discussion on Table 3 below.
[28] As before, however, political patronage does not affect location choices at either the district level or the state level.

openness to trade and a lower frequency of riots at the state level are associated with a larger number of project locations. However, the frequency of riots enters insignificant at the district level. It appears reasonable that merit is assessed at the state level, rather than the district level, considering that state authorities tend to have a larger say on institutional conditions.[29]

We modify our estimation approach in Table 2 by focussing on the determinants at the district level and controlling for heterogeneity across states through fixed effects. State fixed effects control for unobserved heterogeneity beyond the state-level variables in Table 1. The modification reveals a significant impact of the distance between districts and major economic centres. This indicates that the World Bank favours relatively remote districts with presumably greater need. On the other hand, GDP per capita proves to be insignificant in all four specifications with state fixed effects, providing no evidence for a needs-based allocation based on this criterion. Other results are hardly affected. Most importantly, there is still no significant evidence for political patronage at the district level. Existing FDI clusters continue to have a significantly positive impact on location choices (except in column II).

Compared to Tables 1 and 2, we extend our period of observation in Table 3 by including all World Bank projects approved since 2001.[30] In this way we assess whether previous results are affected by changes in the sample of World Bank projects that were still in operation in September 2011. Looking further back and including projects with earlier approval dates implies that the sample increasingly consists of projects of longer duration.[31] All the same, most of our results are hardly affected by the inclusion of projects with approval dates in 2001-2005.

It is only in one respect that the results reported in Table 3 differ considerably from those in Tables 1 and 2. The tsunami dummy is now statistically significant at the ten per cent

[29] Kochhar *et al.* (2006) argue that state-level policies and institutions increasingly mattered in the aftermath of the reform program of the early 1990s.
[30] Redefining the dependent variable in this way implies that clustering at the district level, proxied in Tables 1 and 2 by the number of project locations approved in 2001-2005, can no longer be observed.
[31] The results may also be affected if our independent variables have less predictive power for earlier location choices. This is unlikely to be the case for variables that do not vary, or just slightly, over time.

level or higher in all estimations with both district- and state-level variables included (columns I-V). The same applies for the estimations with state fixed effects (columns VI-VIII). The stronger evidence for location choices being influenced by the tsunami is not surprising. It indicates that the World Bank reacted promptly by approving projects and locating them where emergency relief was most urgently required.

Apart from emergency relief, the evidence for a needs-based allocation of World Bank support continues to be weak in Table 3. Again, lower GDP per capita at the district level is associated with more project locations only in the fully specified model with both district- and state-level variables (column V). In the estimations with state fixed effects, it is only the significantly positive coefficient of (logged) distance that may provide some indirect evidence for a needs-based allocation. Compared to Table 1, the role of institutional and policy conditions at the state level proves to be stronger for the larger sample of World Bank projects. Typically, openness to trade enters highly significant and positive, suggesting that districts in states with better conditions are preferred project locations. Table 3 corroborates that World Bank projects tend to concentrate in districts with clusters of FDI, while political patronage does not appear to matter.

In the final step of our cross section analysis, we account for the spatial lag of the dependent variable.[32] As noted before, large World Bank projects, notably in the field of physical infrastructure, often cover various locations. We expect that a district's chances to attract (parts of) projects improve with the number of project locations in neighbouring districts. In columns I, III and V of Table 4, we simply augment the corresponding Poisson estimations in Tables 1 and 2 by spatial lags as defined above. In addition, we present SARAR models estimated by GS2SLS in columns II, IV and VI in order to account for the endogeneity of spatial lags.

[32] In contrast to Table 3, we return to the sample of World Bank projects approved in 2006-2011.

Spatial lags turn out to be significantly positive as expected, at the ten per cent level or higher, with just one exception in column I. All the same, most previous findings carry over to Table 4. In particular, the variables at the district level closely resemble the corresponding results in Tables 1 and 2. An exception is the frequency of riots which enters negative and significant at the five per cent level in the SARAR model in column II. It should also be noted that all three SARAR models reveal significant effects of previous location choices in 2001-2005 on the number of project locations approved since 2006, at the five per cent level or higher. Hence, it appears that districts have better chances to benefit from subsequent project approvals if they already attracted (parts of) earlier projects. As concerns the variables at the state level, openness to trade is no longer significant when accounting for the endogeneity of the spatial lag in the SARAR models in column II and IV.[33] Nevertheless, we still find evidence that institutional conditions matter at the state level. Economic freedom in column II and the frequency of riots at the state level in column IV (and III) show significant effects.

Estimations with panel data

In the cross section estimations reported so far, we considered the sum of project locations in a particular district for all World Bank projects approved since 2006 (or, alternatively, since 2001). This aggregate perspective appears to be most appropriate for keeping zero observations within reasonable limits. Nevertheless, Santos Silva and Tenreyro (2011) show that the PPML estimator also performs well in the presence of a very large proportion of zeros in the sample.[34]

We slice the project data in two alternative ways in the following. In the first approach, our dependent variable is defined as the number of locations for World Bank projects approved in each single year, rather than during the period 2006-2011 as a whole. In

[33] Moreover, the dummy variable *Coalition* enters significantly negative in column II, which is not particularly intuitive.

[34] The zero-inflated Poisson model, on the other hand, is not appropriate in this context as we do not have two distinct processes generating the zeros and non-zeros.

the second approach, our dependent variable is defined as the number of locations for each single project. In both approaches, we also refine some of the independent variables. In the first approach, we would ideally employ annual data throughout. This is not possible, however, as information is often missing for recent years. Hence, we maintain the assumption underlying the cross section models that location choices throughout the period of observation depend on initial conditions in 2005/06 in terms of GDP per capita (at the district level), the frequency of riots and the number of FDI projects. By contrast, we use time variant information for other variables, including population, the political variables *Chief Minister constituency*, *same party* and *coalition*, and the indicators for the institutional and policy environment at the state level.[35] In the second approach, we further refine the definition of the political variables, i.e., they refer to the Chief Ministers in power at the exact approval date of the respective project.

Table 5 presents the results of the first panel approach with annual observations of the dependent variable.[36] We report estimations with and without spatial lags. Columns II, IV and VI clearly indicate the importance of spatial lags for location choices.[37] However, the inclusion of spatial lags has typically limited effects on our variables of major interest. Table 5 corroborates several of our previous findings. First, the number of project locations increases with the size (in terms of population) of districts, while districts in larger states are again penalized. Second, the number of project locations is higher in districts hosting more FDI projects. This finding supports the view that the World Bank responds favourably to demands, e.g., for better infrastructure, by foreign investors and local authorities. All the same, the estimations with fixed state effects attest that the World Bank is more strongly engaged in remote districts.

[35] See Appendix C for those variables that had to be interpolated.
[36] Compared to previous tables, we reduce the number of specification and focus on the fully specified estimations for the sake of brevity.
[37] Note that SARAR models cannot be applied in this context as the used command spreg is not suitable for panel data. This implies that we do not account for the endogeneity of spatial lags here and in Table 6 below.

Third, we again find no evidence for political patronage at either the state or the district level. Fourth, Table 5 also corroborates that our proxy of merit at the district level, *riots*, has no significant impact on the location of World Bank projects. In contrast to the cross section analysis, however, the panel data estimations no longer provide any evidence that merit matters at the state level.

Fifth, the panel data estimations for the fully specified models with district- and state-level variables (columns III and IV) suggest that districts with lower GDP per capita receive a larger number of project locations. Nonetheless, the evidence for a needs-based allocation of World Bank support continues to be weak when defining the dependent variable on an annual basis. Note that GDP per capita at the state level now enters significantly positive, at the one per cent level, when added to the variables at the state level in columns III and IV. This indicates that districts are penalized if they are located in poor Indian states.

Finally, Table 6 presents the results for the second approach with project-related observations of the dependent variable. Once again, we present estimations with and without spatial lags. Note that all estimations in Table 6 include project fixed effects to account for unobserved project heterogeneity.[38] Nevertheless, the results are similar to those in Table 5. A major difference is that the spatial lag proves to be insignificant in the estimation with state fixed effects. It appears that location choices in neighbouring districts with respect to the same project do not affect the number of locations in the district under consideration once state fixed effects have been taken into account.[39]

4. Summary and conclusion

Aid allocation studies typically stop short of assessing the targeting of foreign aid according to the need and merit within recipient countries. Recent efforts by AidData, in collaboration with the World Bank, help explore the geography of on-going World Bank projects. We

[38] For the last column, we had to run the GLM poisson command in Stata, which relies on the iterated re-weighted least squares algorithm, in order to achieve convergence of the likelihood function.
[39] Furthermore, *Chief Minister constituency* proves to be significantly negative in two out of three estimations with spatial lags. This result is clearly surprising and counterintuitive.

combine the location-specific information for projects in India with the exceptionally rich data reflecting economic, institutional and political conditions in Indian states and districts to assess the allocation of aid within one of the major recipient countries of World Bank support.

We perform Poisson estimations across Indian districts, supplemented by panel data specifications. We also augment the models by spatial lags and account for their endogeneity by using spatial econometric techniques (SARAR models estimated by GS2SLS). Our major results can be summarized as follows. First of all, the evidence of needs-based location choices across Indian districts by the World Bank is very weak, even though activities tend to concentrate in relatively remote districts. Second, spatial lags prove to be significant and positive, indicating that the chances of districts to participate in aid projects improve when the World Bank is active in neighbouring districts. Third, institutional conditions matter insofar as project locations cluster in districts belonging to states with greater openness to trade and fewer riots. However, there is no longer any evidence for a merit-based aid allocation in the panel data analyses. Fourth, we do not find any evidence that location choices are affected by political patronage at the state or district level. On the other hand, the World Bank prefers districts where foreign direct investors may benefit from projects related to infrastructure.

These findings could be relevant for the authorities in the recipient country as well as the World Bank. As concerns the former, the importance of spatial lags suggests that remote areas are well advised to join forces when trying to attract aid projects. Local authorities at lower administrative levels may realize that their own influence is limited when it comes to merit-based aid allocation. This could necessitate cooperation with higher levels of the political administration to improve the institutional environment and governance that donors may require to engage locally. However, the present case study is clearly insufficient to conclude that cooperation along these lines between different administrative levels would be more effective in attracting foreign aid projects than political patronage along party lines and by favouring political constituencies.

As concerns the World Bank, the initial quote from *The Economist* suggests that it will become increasingly important to target poor people. Location choices within recipient countries could be an essential element in this regard. However, we find little evidence that the World Bank favours locations with greater need for aid. This invites the conclusion that the World Bank should adhere to its own insights more strictly than the Indian case suggests it does. In particular, it appears that local needs for aid have to be assessed more systematically in order to render World Bank aid more effective in fighting poverty at the local level. In this context, the Indian case is encouraging as it appears possible for the World Bank to deal directly with state governments and, thereby, avoid political patronage and meddling by the central government.

Finally, the implications of our analysis extend beyond the World Bank as a leading multilateral donor. Bilateral donors face the same challenge of targeting aid not only to poor countries with appropriate governance for aid to be effective, but also to locations within recipient countries where the need for aid is most obvious and local conditions are conducive to a productive use of external support. Progress in mapping the geography of aid projects within recipient countries could provide an important step towards meeting this challenge. It would allow for comparisons between bilateral and multilateral donors in future research. Deeper insights into the allocation of aid may be gained in particular if location-specific information on aid projects as well as the economic, institutional and political covariates covered an increasing number of donors and recipient countries.

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Table 1 - PPML estimations, number of locations at the district level for all projects approved in 2006-2011, district- and state-level determinants

	I	II	III	IV	V	VI
Log per capita GDP	0.151	0.258	0.0887	0.0788	0.110	-0.613*
	(0.485)	(0.455)	(0.507)	(0.515)	(0.525)	(0.313)
Log population	0.491***	0.446***	0.455***	0.476***	0.489***	0.948***
	(0.148)	(0.118)	(0.146)	(0.156)	(0.141)	(0.124)
Riots	-0.00822	-0.0262	-0.0153	-0.0149	-0.0140	-0.000118
	(0.0295)	(0.0274)	(0.0288)	(0.0294)	(0.0286)	(0.00996)
Tsunami	0.392	0.582*	0.396	0.412	0.297	0.386
	(0.320)	(0.326)	(0.334)	(0.330)	(0.400)	(0.348)
Chief Minister constituency	0.190	0.177	0.169	0.116	0.113	-0.0604
	(0.246)	(0.249)	(0.255)	(0.228)	(0.219)	(0.165)
FDI projects			0.000141	0.000154	0.000168	0.000450***
			(0.000233)	(0.000209)	(0.000208)	(0.000120)
Log distance				0.0111	0.0115	0.131
				(0.0718)	(0.0731)	(0.0823)
Project locations 2001-2005					0.131	0.0173
					(0.0807)	(0.0560)
Same party	-0.245	-0.309	-0.233	-0.235	-0.251	-0.0924
	(0.474)	(0.427)	(0.469)	(0.467)	(0.467)	(0.485)
Coalition	-0.392	-0.457	-0.592	-0.646	-0.724	-0.261
	(0.791)	(0.776)	(0.818)	(0.837)	(0.840)	(0.564)
Economic freedom	3.256		2.937	2.991	2.909	1.429
	(2.473)		(2.428)	(2.496)	(2.450)	(1.603)
Trade openness		6.107*	5.034*	5.409*	3.994	8.201***
		(3.200)	(2.879)	(2.809)	(3.058)	(3.043)
Log per capita GDP (state)						0.632
						(0.491)
Log population (state)						-0.805***
						(0.210)
Riots (state)						-0.0749**
						(0.0341)
Constant	-8.734**	-7.916*	-7.515	-7.892	-8.371	-0.587
	(4.297)	(4.269)	(4.779)	(5.308)	(5.401)	(7.451)
Observations	472	509	472	468	468	468
State Fixed Effects	N0	N0	N0	N0	NO	NO
Pseudo R-squared	0.100	0.123	0.110	0.112	0.117	0.215

Robust standard errors clustered by state in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2 - PPML estimations, number of locations at the district level for all projects approved in 2006-2011, district-level determinants and state fixed effects

	I	II	III	V
Log per capita GDP	-0.288	-0.323	-0.299	-0.285
	(0.307)	(0.298)	(0.273)	(0.290)
Log population	0.770***	0.747***	0.818***	0.810***
	(0.106)	(0.0969)	(0.0998)	(0.0989)
Riots	-0.0142	-0.0148	-0.00526	-0.00547
	(0.0114)	(0.0113)	(0.0106)	(0.0106)
Tsunami	0.201	0.188	0.158	0.0955
	(0.258)	(0.269)	(0.189)	(0.245)
Chief Minister constituency	-0.0459	-0.111	-0.00602	-0.000583
	(0.173)	(0.200)	(0.152)	(0.148)
FDI projects		0.000194	0.000423***	0.000436***
		(0.000145)	(0.000111)	(0.000109)
Log distance			0.209***	0.209***
			(0.0529)	(0.0505)
Project locations 2001-2005				0.0588
				(0.0416)
Constant	-8.116***	-7.407***	-11.31***	-11.31***
	(2.679)	(2.669)	(2.468)	(2.506)
Observations	509	509	499	499
State Fixed Effects	YES	YES	YES	YES
Pseudo R-squared	0.343	0.344	0.345	0.346

Robust standard errors clustered by state in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3 - PPML estimations, number of locations at the district level for all projects approved in 2001-2011

	I	II	III	IV	V	VI	VII	VIII
Log per capita GDP	0.121	0.190	0.0432	0.0364	-0.568**	-0.302	-0.328	-0.301
	(0.427)	(0.404)	(0.443)	(0.453)	(0.266)	(0.262)	(0.255)	(0.233)
Log population	0.390***	0.383***	0.347**	0.365**	0.846***	0.700***	0.681***	0.751***
	(0.143)	(0.119)	(0.146)	(0.157)	(0.120)	(0.107)	(0.102)	(0.106)
Riots	-0.00696	-0.0247	-0.0165	-0.0160	-0.00240	-0.0157	-0.0161	-0.00743
	(0.0281)	(0.0256)	(0.0267)	(0.0274)	(0.0105)	(0.0108)	(0.0107)	(0.0107)
Tsunami	0.490*	0.655**	0.497*	0.508*	0.482**	0.314*	0.303*	0.273**
	(0.260)	(0.273)	(0.268)	(0.263)	(0.241)	(0.177)	(0.184)	(0.107)
Chief Minister constituency	0.157	0.136	0.145	0.111	-0.0352	-0.0536	-0.109	0.0169
	(0.231)	(0.234)	(0.243)	(0.217)	(0.154)	(0.169)	(0.199)	(0.143)
FDI projects			0.000128	0.000163	0.000450***		0.000149	0.000411***
			(0.000213)	(0.000187)	(0.000124)		(0.000147)	(0.000107)
Log distance				0.0269	0.168**			0.226***
				(0.0634)	(0.0786)			(0.0657)
Same party	-0.160	-0.225	-0.136	-0.130	0.147			
	(0.441)	(0.390)	(0.429)	(0.426)	(0.392)			
Coalition	-0.156	-0.302	-0.423	-0.451	0.0486			
	(0.745)	(0.701)	(0.751)	(0.763)	(0.460)			
Economic freedom	2.888		2.456	2.470	0.825			
	(2.417)		(2.343)	(2.402)	(1.504)			
Trade openness		7.620***	6.853***	7.147***	11.30***			
		(2.910)	(2.575)	(2.541)	(2.617)			
Log per capita GDP (state)					0.356			
					(0.423)			
Log population (state)					-0.878***			
					(0.177)			
Riots (state)					-0.0781**			
					(0.0329)			
Constant	-6.800*	-6.335*	-5.320	-5.868	4.185	-6.883***	-6.344***	-10.47***
	(3.783)	(3.770)	(4.186)	(4.664)	(6.364)	(2.396)	(2.403)	(2.359)
Observations	472	509	472	468	468	509	509	499
State Fixed Effects	N0	N0	N0	N0	N0	YES	YES	YES
Pseudo R-squared	0.0996	0.136	0.119	0.120	0.225	0.327	0.328	0.329

Robust standard errors clustered by state in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 - PPML and SARAR by GS2SLS estimations with spatial lags (based on inverse distances), number of locations at the district level for all projects approved in 2006-2011

	I	II	III	IV	V	VI
	poisson	SARAR	poisson	SARAR	poisson	SARAR
Spatial lag (Wy)	0.167	3.451***	0.196*	2.906***	0.202***	1.560**
	(0.143)	(0.679)	(0.101)	(0.713)	(0.0297)	(0.759)
Log per capita GDP	0.0890	-0.330	-0.645**	-0.900*	-0.327	-0.544
	(0.525)	(0.507)	(0.324)	(0.531)	(0.294)	(0.535)
Log population	0.482***	1.417***	0.924***	1.949***	0.790***	1.897***
	(0.147)	(0.225)	(0.118)	(0.251)	(0.0928)	(0.235)
Riots	-0.0155	-0.0581**	0.00147	-0.00599	-0.00327	-0.0123
	(0.0277)	(0.0237)	(0.00995)	(0.0300)	(0.0102)	(0.0249)
Tsunami	0.334	-0.300	0.427	0.109	0.102	0.512
	(0.408)	(0.810)	(0.375)	(0.793)	(0.255)	(0.731)
Chief Minister constituency	0.136	-0.329	-0.0321	-0.443	-0.00802	-0.0457
	(0.218)	(0.739)	(0.167)	(0.692)	(0.153)	(0.486)
FDI projects	0.000178	0.00197*	0.000465***	0.00223**	0.000450***	0.00222**
	(0.000211)	(0.00107)	(0.000117)	(0.000985)	(0.000113)	(0.000980)
Log distance	0.0181	0.363	0.138*	0.447**	0.211***	0.573***
	(0.0714)	(0.221)	(0.0802)	(0.212)	(0.0505)	(0.197)
Project locations 2001-2005	0.131	0.695***	0.0227	0.448**	0.0629	0.385**
	(0.0818)	(0.175)	(0.0608)	(0.184)	(0.0393)	(0.195)
Same party	-0.220	-0.185	-0.131	0.408		
	(0.470)	(0.450)	(0.466)	(0.624)		
Coalition	-0.824	-1.404**	-0.407	-0.383		
	(0.818)	(0.689)	(0.556)	(0.878)		
Economic freedom	3.229	4.114*	1.582	0.159		
	(2.449)	(2.200)	(1.551)	(2.377)		
Trade openness	5.099*	-5.521	8.874***	4.837		
	(2.870)	(6.413)	(2.835)	(6.409)		
Log per capita GDP (state)			0.754	-0.272		
			(0.470)	(0.781)		
Log population (state)			-0.757***	-1.549***		
			(0.206)	(0.319)		
Riots (state)			-0.0812***	-0.209***		
			(0.0308)	(0.0681)		
Constant	-8.371	-29.23***	-2.224	1.463	-10.68***	-26.16
	(5.509)	(7.723)	(7.280)	1.463	(2.619)	(0)
Wu		1.771***		1.882		0.895
		(0.594)		(1.502)		(1.549)
Observations	458	458	458	458	488	488
State Fixed Effects	NO	NO	NO	NO	YES	YES

Robust standard errors in parentheses; clustered by state in uneven columns

*** p<0.01, ** p<0.05, * p<0.1

Table 5 - PPML estimations, number of locations at the district level for all projects by year from 2006 to 2011

	I	II	III	IV	V	VI
Spatial lag (Wy)		3.039***		3.059***		3.532**
		(0.671)		(0.694)		(1.414)
Log per capita GDP	-0.0465	-0.103	-0.630**	-0.617**	-0.289	-0.323
	(0.423)	(0.376)	(0.293)	(0.279)	(0.288)	(0.268)
Log population	0.422**	0.378**	0.728***	0.595***	0.781***	0.756***
	(0.173)	(0.172)	(0.136)	(0.128)	(0.109)	(0.112)
Riots	0.00939	-0.00287	-0.00850	0.00561	-0.00446	0.00826
	(0.0259)	(0.0249)	(0.0114)	(0.0104)	(0.0107)	(0.0120)
Tsunami	0.0851	0.166	0.102	0.204	0.0843	0.207
	(0.430)	(0.333)	(0.434)	(0.364)	(0.252)	(0.231)
Chief Minister constituency	0.205	-0.0484	0.0357	-0.124	0.0541	-0.0739
	(0.216)	(0.245)	(0.197)	(0.227)	(0.158)	(0.212)
FDI projects	0.000214	0.000270	0.000359**	0.000351***	0.000308*	0.000322**
	(0.000224)	(0.000185)	(0.000179)	(0.000128)	(0.000185)	(0.000146)
Log distance	0.0495	0.103	0.0802	0.115	0.212***	0.274***
	(0.0841)	(0.0832)	(0.0816)	(0.0816)	(0.0612)	(0.0617)
Project locations 2001-2005	0.166*	0.176**	0.164*	0.158*	0.0713*	0.0801*
	(0.0957)	(0.0890)	(0.0890)	(0.0906)	(0.0425)	(0.0480)
Same party	0.0923	0.157	-0.124	-0.112		
	(0.262)	(0.228)	(0.289)	(0.247)		
Coalition	0.184	-0.259	0.0882	-0.370		
	(0.431)	(0.398)	(0.396)	(0.379)		
Economic freedom	2.973	2.075	1.970	0.568		
	(2.178)	(1.947)	(1.701)	(1.665)		
Trade openness	-2.690	0.196	-8.994	-4.826		
	(5.854)	(4.740)	(7.115)	(6.098)		
Log per capita GDP (state)			1.125***	1.190***		
			(0.339)	(0.359)		
Log population (state)			-0.323***	-0.199*		
			(0.104)	(0.112)		
Riots (state)			-0.0117	-0.0518		
			(0.0426)	(0.0369)		
Constant	-8.904*	-8.172*	-13.56***	-14.58***	-13.20***	-13.18***
	(4.785)	(4.401)	(4.590)	(4.339)	(2.783)	(2.869)
Observations	2,688	2,634	2,688	2,634	2,853	2,793
State Fixed Effects	NO	NO	NO	NO	YES	YES
Time Fixed Effects	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0.138	0.199	0.165	0.220	0.226	0.276

Robust standard errors clustered by state in parentheses
*** p<0.01, ** p<0.05, * p<0.1

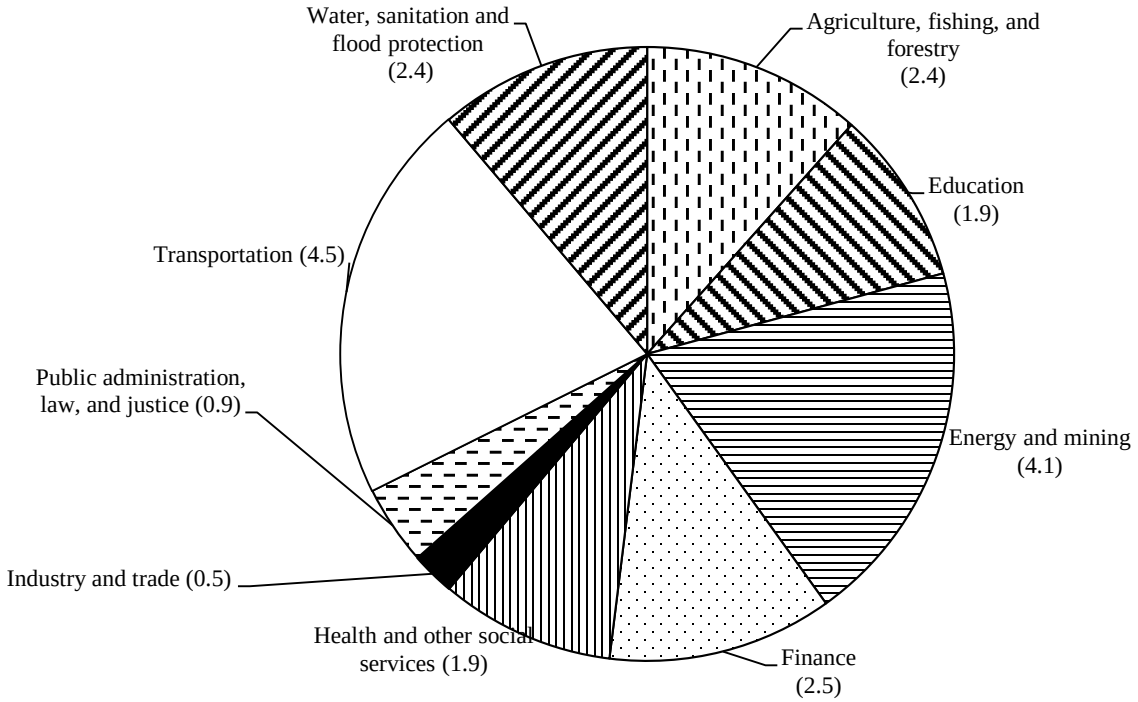
Table 6 - PPML estimations, number of project-specific locations at the district level (for each project approved in 2006-2011)

	I	II	III	IV	V	VI
Spatial lag (Wy)		0.985***		0.981***		1.543
		(0.161)		(0.152)		(1.223)
Log per capita GDP	-0.0685	-0.163	-0.624**	-0.692***	-0.282	-0.389
	(0.419)	(0.362)	(0.286)	(0.260)	(0.291)	(0.245)
Log population	0.448**	0.398**	0.748***	0.556***	0.794***	0.807***
	(0.174)	(0.186)	(0.133)	(0.134)	(0.106)	(0.157)
Riots	0.0115	-0.000193	-0.00831	0.00455	-0.00477	0.00414
	(0.0249)	(0.0247)	(0.0116)	(0.0114)	(0.0104)	(0.0333)
Tsunami	0.106	0.301	0.116	0.333	0.0816	0.336
	(0.431)	(0.307)	(0.435)	(0.358)	(0.252)	(0.241)
Chief Minister constituency	0.258	-2.563**	0.125	-2.364**	0.125	-1.046
	(0.217)	(1.288)	(0.204)	(1.131)	(0.160)	(1.025)
FDI projects	0.000381**	0.000517***	0.000519***	0.000567***	0.000468***	0.000526***
	(0.000191)	(0.000195)	(0.000137)	(0.000118)	(0.000114)	(0.000118)
Log distance	0.0504	0.0356	0.0836	0.0153	0.223***	0.220**
	(0.0867)	(0.0939)	(0.0825)	(0.0849)	(0.0535)	(0.0869)
Project locations 2001-2005	0.191**	0.184**	0.184**	0.162*	0.0604	0.0849*
	(0.0838)	(0.0902)	(0.0851)	(0.0951)	(0.0412)	(0.0475)
Same party	0.0270	0.229	-0.175	-0.0835		
	(0.280)	(0.274)	(0.321)	(0.302)		
Coalition	-0.198	-0.389	-0.234	-0.489**		
	(0.287)	(0.247)	(0.255)	(0.237)		
Economic freedom	3.589*	2.531	2.635	0.802		
	(2.104)	(1.832)	(1.706)	(1.535)		
Trade openness	-1.043	2.434	-7.081	-2.817		
	(5.948)	(5.827)	(7.454)	(7.280)		
Log per capita GDP (state)			1.054***	1.344***		
			(0.347)	(0.417)		
Log population (state)			-0.313***	-0.123		
			(0.103)	(0.118)		
Riots (state)			-0.00439	-0.0466		
			(0.0417)	(0.0363)		
Constant	-9.061*	-7.636*	-13.28***	-15.38***	-13.25***	-12.95***
	(4.859)	(4.251)	(5.079)	(4.804)	(2.586)	(4.306)
Observations	25,409	24,875	25,409	24,875	27,084	26,495
State Fixed Effects	NO	NO	NO	NO	YES	YES
Project Fixed Effects	YES	YES	YES	YES	YES	YES
Pseudo R-squared	0.155	0.231	0.168	0.242	0.205	

Robust standard error clustered by states in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Appendix A: Sector-specific World Bank commitments in India, 2006-2011 (US$ billion)



Source: AidData (http://open.aiddata.org/content/index/geocoding)

Appendix B: Distribution of World Bank projects across Indian states, 2006-2011

State/ Union territory	Project locations in a particular state, 2006-2011	
	Absolute number	Per million of inhabitants
Tamil Nadu	205	3.15
Andhra Pradesh	135	1.67
Punjab	135	5.18
Bihar	120	**1.32**
Maharashtra	117	1.12
Karnataka	111	1.97
Orissa	105	**2.7**
Jharkhand	78	**2.66**
Rajasthan	78	**1.25**
Madhya Pradesh	77	**1.16**
Uttar Pradesh	67	**0.37**
Uttarakhand	52	5.64
Himachal Pradesh	50	7.74
West Bengal	49	**0.57**
Haryana	43	1.84
Gujarat	39	0.71
Chhattisgarh	32	**1.42**
Meghalaya	19	**7.69**
Kerala	14	0.42
Andaman and Nicobar	5	11.9
Jammu and Kashmir	4	**0.37**
Arunchal Pradesh	2	1.71
Daman and Diu	2	9.09
Delhi	2	0.12
Goa	1	0.67
Lakshadweep	1	14.29
Mizoram	1	**1.05**
Pondicherry	1	0.91
Assam	0	**0**
Chandigarh	0	0
Dadra and Nagar Haveli	0	0
Manipur	0	**0**
Nagaland	0	0
Sikkim	0	0
Tripura	0	**0**

Note: Ranked according to absolute numbers in the first column; bold figures in last column for states and Union territories whose average per-capita income in 2005/06 was below the average for all-India; data on per-capita income are missing for Daman and Diu, Dadra and Nagar Haveli, and Lakshadweep.

Source: AidData (http://open.aiddata.org/content/index/geocoding); Planning Commission (http://planningcommission.nic.in/data/datatable/index.php?data=datatab).

Appendix C: Definition of variables and data sources

Variable	Definition	Source
Project locations 2006-2011	Total number of locations of World Bank aid projects at district level, approved in 2006-2011 and still active as of September 2011	AidData http://open.aiddata.org/content/index/geocoding
Log per capita GDP	Log of Gross Domestic Product per capita at district level	Planning Commission – Government of India http://planningcommission.nic.in/plans/stateplan/index.php?state=ssphdbody.htm
Log population	Log of total population at district level (interpolated in the panel data analyses)	India Census (2001 and 2011). http://www.censusindia.gov.in/2011-provresults/census2011_PPT_paper1.html
Riots	Number or riots at district level by 100,000 inhabitants	Marshall and Marshall (2008)
Tsunami	Dummy variable, set equal to one if district was affected by the 2004 tsunami	http://www.mapsofindia.com/maps/tsunami-in-india/tsunami-affected-area-india.html.
Chief Minister constituency	Dummy variable set equal to one if the Chief Minister of the state had her constituency in district i at period t, weighted by months	Own collection based on internet search
FDI projects	Total number of foreign direct investment projects at district level in the 1991-2005 period	Unpublished data from the Indian Ministry of Commerce and Industry
Log distance	Log of minimum travel time based on a cost distance analysis of a district to any of the ten most important economic centres in the country	Jewell, Edward and Hyoung Gun Wang - World Bank's Finance, Economics and Urban Department.
Project locations 2001-2005	Total number of locations of World Bank aid projects at district level, approved in 2001-2005 and still active as of September 2011	AidData
Same party	Variable set equal to one if the same party is ruling at the state and federal level at period t, and 0 otherwise, weighted by months	Own collection based on internet search
Coalition	Variable set equal to one if the party ruling at the state level is in coalition at the federal level at period t, and 0 otherwise, weighted by months	Own collection based on internet search
Economic freedom	Score varying from zero to ten rating the size of government, legal structure and property rights, access to sound money, freedom to trade internationally and labor and business regulations at state level (interpolated in the panel data analyses)	Debroy et. al. (2011)
Trade openness	Total exports at state level divided by Gross Domestic Product (interpolated in the panel data analyses)	Export Promotion Council for EOUs and SEZs http://www.eouindia.gov.in/fact_figure09.htm#005
Log per capita GDP (state)	Log of Gross Domestic Product per capita at state level (interpolated in the panel data analyses)	Reserve Bank of India http://www.rbi.org.in/scripts/AnnualPublications.aspx?head=Handbook%20of%20Statistics%20on%20Indian%20Economy
Log population (state)	Log of total population at state level	Reserve Bank of India
Riots (state)	Number of riots at state level by 100,000 inhabitants	Marshall and Marshall (2008)

Note: All links accessed in May 2012.

Appendix D: Descriptive Statistics

Variable	Observations (districts)	Observations (states)	Mean	Std. Dev.	Minimum	Maximum
Project locations 2006-2011	620	N/A	2.2	2.9	0	19
Log per capita GDP	521	N/A	9.9	0.6	6.2	12.2
Log population	584	N/A	14.1	1.0	10.4	16.1
Riots	580	N/A	4.9	5.1	0.0	30.9
Tsunami	620	N/A	0.1	0.2	0	1
Chief Minister constituency	613	N/A	0.0	0.2	0	1
FDI projects	620	N/A	26.5	173.3	0	2984
Log distance	586	N/A	12.9	0.7	7.1	14.1
Project locations 2001-2005	620	N/A	0.3	0.7	0	5
Same party	613	29	0.3	0.4	0	1
Coalition	613	29	0.2	0.3	0	1
Economic freedom	548	20	0.4	0.1	0.3	0.6
Trade openness	615	30	0.0	0.0	0.0	0.2
Log per capita GDP (state)	616	31	10.0	0.4	9.0	11.4
Log population (state)	620	34	17.4	1.4	11.0	19.0
Riots (state)	620	34	5.2	4.0	0.0	19.2