Bureaucrat Allocation in the Public Sector: Evidence from the World Bank*

Nicola Limodio†

October 2020

Abstract

The allocation of bureaucrats across tasks constitutes a pivotal instrument for achieving an organization's objectives. In this paper, I measure the performance of World Bank bureaucrats by combining the universe of task assignment with an evaluation of task outcome and a hand-collected dataset of bureaucrat CVs. I introduce two novel stylized facts. First, bureaucrat performance correlates with task features and individual characteristics. Second, there exists a negative assortative matching between high-performing bureaucrats and low-performing countries. In the aftermath of natural disasters, which may weaken countries' performance even further, I observe that low-performing countries receive an additional allocation of high-performing bureaucrats. I discuss various interpretations of these findings.

JEL Code: M54, J45, O19

Keywords: Personnel Management, Public Sector, International Organizations

*I am grateful to the editor, Frederic Vermeulen, and the three anonymous referees for their excellent comments. This paper has benefitted from discussions with and the suggestions of Gani Aldashev, Esteban Aucejo, Oriana Bandiera, Marianne Bertrand, Tim Besley, Gharad Bryan, Robin Burgess, Francesco Decarolis, Mathias Dewatripont, Bram De Rock, Axel Dreher, Antonio Estache, Daniel Ferreira, Alessandro Gavazza, Pamela Giustinelli, Ethan Ilzetzki, Gilat Levy, Philip Keefer, Christopher Kilby, Sebastian Galiani, Dirk Jenter, Eliana La Ferrara, Ross Levine, Guy Michaels, John Nye, Gerard Padro i Miquel, Bradley Parks, Martin Pesendorfer, Michael Peters, Jorn-Steffen Pischke, Carol Propper, Johan Rockoff, Mary Shirley, Diego Ubfal, John Van Reenen, and seminar participants at Bocconi, the European Economic Association 2015, the Political Economy of International Organizations Conference 2015, the Royal Economic Society 2015, the Ronald Coase Institute Workshop 2014, LSE, and Universite Libre de Bruxelles. I thank Maya Judd for her editorial assistance. Cristiana Gentea, Federico Lenzi, Edoardo Marchesi, Lorenzo Schirato, and Boris Turkin provided excellent research assistance. This work was previously circulated as "Manager Assignment and Project Returns: Evidence from the World Bank." I acknowledge the support of the Junior Fellowship of the Royal Economic Society for this research project. All errors are my own.

†nicola.limodio@unibocconi.it, www.nicolalimodio.com, Bocconi University, Department of Finance, BAFFI CAREFIN and IGIER, Via Roentgen 1, 20136 Milan, Italy.

1 Introduction

Bureaucrats constitute a primary input in producing and delivering public goods. In the past decade, a growing field at the intersection of organizational and personnel economics has explored three dimensions of the relation between bureaucrats and the public sector: matching, incentives, and motivation (Bloom and Van Reenen (2011)). However, this literature presents an unanswered research question: do organizations achieve their objectives by allocating, and re-allocating, bureaucrats across internal tasks? This is an especially popular tool in the public sector given that hiring and firing decisions are heavily regulated by law, performance pay is often limited by output observability, and motivational interventions are challenging to implement on a large scale.

In this paper, I illustrate how bureaucrat allocation represents an alternative instrument of human resource management, which organizations adopt to achieve their objectives. To offer empirical evidence on this mechanism, I focus on a specific organization, the World Bank, which is characterized by ideal features for this study both in terms of measurement and data. I verify that bureaucrat assignment across tasks effectively takes place, which offers new insights on how the public sector works and explore various implications of this finding.

Conducting an empirical analysis on bureaucrat assignment is often challenging (Oyer et al. (2011)) due to three fundamental constraints. First, it is difficult to identify the tasks performed by a bureaucrat within an organization. Second, it requires observing a record of bureaucrat-task assignment over time. Third, it requires access to an accurate measure of task performance, which is generally unavailable in the public sector.

To address these issues, my empirical analysis focuses on the World Bank, a rich and complex organization, which provides an unparalleled setting to pursue this investigation. The typical bureaucrat employed by the World Bank (hereafter referred to as a "manager") is responsible for designing, supervising, and managing various projects funded by the organization. These projects are implemented in low- and middle-income countries and target multiple sectors (e.g., roads, electricity, water). Such a context allows to address the first difficulty, by mapping managers' tasks into a World Bank project. The second challenge is handled by exploiting an administrative dataset of internal tasks (the World Bank Project Performance Ratings), permitting the study of manager-task assignment over time. This source furthermore contains

information on the universe of World Bank projects, including the country and sector in which they are implemented and, especially, an indicator of project success. This last aspect helps to overcome the third issue, as it enables quantification of the input of a manager towards the success of a project.

I complement this information with two additional databases. First, I collect information regarding the identity of the manager from publicly available documentation on the World Bank. Second, I use a variety of online sources (e.g., report biography, résumé, LinkedIn profile) to assemble a novel dataset containing information on the CVs of a sample of managers. I am consequently able to assess 3,385 projects over a long time span (from 1980 to 2012), comprising more than 15 sectors and 127 countries, matched with the identity and characteristics of 715 managers.

I proceed through three steps in my empirical analysis. First, I regress the rating of project success on manager and country fixed effects and additional covariates. Through this regression, I extract manager effects (MEs) and country effects (CEs) in line with value-added models (Todd and Wolpin (2003) and Aucejo (2011)). These are validated as performance indices in delivering successful projects by being related to predetermined or observable characteristics, respectively curricula vitae and institutions. Second, I investigate the assignment of managers to countries by correlating MEs with CEs, and note a negative correlation between these two variables. This implies a negative assortative matching with high-performing managers operating in low-performing countries, which occurs both for existing staff and newly-hired managers. Conceptually, this exercise parallels the worker–firm wage-determination literature, following the study by Abowd et al. (1999), and, more generally, work in the management and organization field, in line with Bandiera et al. (2015). In addition, I also examine the appointment of World Bank managers to countries in the aftermath of natural disasters and find that low-performing countries receive a "disaster premium" of even better managers compared with the usual assignment. Third, I implement various robustness checks to investigate the content of these effects, as well as alternative estimations, and account for a set of specific unobservables.

Given the unique organizational setting of the World Bank, some of these results are specific to this complex entity. In light of this, I explicitly discuss various factors that could drive the negative assortative match, including the preferences of the institution, the technology of its

projects, and its internal labour market, among others. However, my findings are also applicable beyond the World Bank, given that human capital is a critical resource for most entities in the public sector. Moreover, it is also important to highlight that the allocation of bureaucrats does not necessarily imply a simplistic "top-down" approach, through which the organization acts like a planner in allocating its resources. In fact, it is possible that the preferences of an organization shape its system of incentives and promotions, which leads the internal labor market to match the objectives on a specific allocation through a "bottom-up" approach.

This paper contributes to three debates in the literature. First, building on the organizational economics literature (Besley and Ghatak (2005), Ashraf et al. (2014)), this paper shows a novel mechanism through which organizations achieve their objectives: the allocation, and reallocation, of bureaucrats across tasks. As a result, it offers new insights in a debate that focused mostly on matching, incentives, and motivation. Two papers are particularly related, as they offer evidence of negative assortative matching across workers and tasks. Fenizia (2019) studies the productivity of managers in a large Italian government office (INPS) and finds evidence of a negative correlation between manager and office fixed effects. Adhvaryu et al. (2020) focus on the sorting pattern of managers to workers in a garment manufacturer in India and identify a negative assortative matching. In addition to these papers, Rasul and Rogger (2018) show that autonomy and incentives are critical correlates behind the quantity and quality of public good provision in Nigeria. Burgess et al. (2017) are among the first to investigate an experimental setting to study the role of incentives in the public sector. They leverage the experimental assignment of workers to a team-based performance pay in a major UK government agency and find evidence of a well-estimated zero average effect on performance and, especially, that incentivised areas allocated the best managers to the hardest jobs. Colonnelli et al. (2017) reveal the importance of political patronage in worker allocation in the public sector in Brazil. At the same time, Bertrand et al. (2017) provide evidence that bureaucrat performance may be driven by the career incentive of reaching the top of a public organization. Decarolis et al. (2018) showthat a more competent public bureaucracy contributes to better economic outcomes by cutting delays, cost overruns and renegotiations. Estache et al. (2016) instead investigate how political (mis)alignment affects public service delivery when mandates are shared between state and local governments in Brazil. Deserranno (2019) explores the role

of financial incentives in the selection, matching, and performance of health workers in Uganda while Dal Bó et al. (2013) study how financial incentives boost the pool of job applicants for public sector jobs in Mexico, and how salaries compensate for less attractive job attributes (e.g., distance, municipal environment). Burgess et al. (2010) analyze the relation between task assignment and effort by examining the introduction of an incentive system in the UK tax collection agency and find subsequent increases in productivity. Finally, Coviello et al. (2014) study the trade-off between worker effort and "task juggling," showing that forces external to the worker (e.g., clients, co-workers) can affect worker choices.

Second, this paper offers a contribution to studying the assignment of workers in the public sector (managers and/or bureaucracts) and validates that the specific manager effects correlate with alternative measures of performance. The implications of these methods enrich the results from the value-added framework (Hanushek (1971), Chetty et al. (2014)) and the study of management in firms and organizations (Bloom and Van Reenen (2007), Bloom et al. (2012)). My findings are in line with the work of Bertrand and Schoar (2003) on management and its performance-enhancing effect, that of Bandiera et al. (2013) on team incentives, and of Bloom et al. (2015) on management in schools. Janke et al. (2019) study the role of CEOs in English public hospitals, showing that despite the existence of a pay differential, there is little evidence of CEOs effect on hospital inputs and performance. De Rassenfosse et al. (2019) exploit the deaths of managers as a shock to the functioning of their specific offices, giving evidence in line with these deaths inducing a shortage of skilled workers in the bureau and affecting procurement performance.

Finally, this research offers novel results to a growing literature on development lending and international organizations. In this respect, my paper provides new insights on the "organizational economics of international organizations" and the ability of such institutions to shape projects through the allocation of internal resources. Isham et al. (1997) and Isham and Kaufmann (1999), for example, show that recipient countries' institutions and country-level differences do affect project performance. Dreher et al. (2009), Kilby (2013), and Dreher et al. (2019) demonstrate that political economy determinants explain both the approval of the World Bank (and the IFC), and its preparation time. Denizer et al. (2013) provide evidence on the macro- and micro-determinants of project success, with a particular focus on the crucial role

of managers. Kilby (2015) instead studies the causal effect of project preparation on its implementation, while Presbitero (2016) illustrates that, in periods of public investment scaling-up, World Bank projects are likely to be less successful, in line with a limited absorptive capacity hypothesis. Finally, Broccolini et al. (2019) show that World Bank funding crowds-in private lending both in the short and long-run.

The rest of the paper is organized as follows. In Section 2, I describe the datasets employed in the analysis, the World Bank's process of project evaluation, and the empirical model used to extract MEs and CEs. Section 3 illustrates the summary statistics on MEs and CEs and their correlation with CVs and institutions. In addition, I present the main results on the negative assortative matching between managers and countries and provide an interpretation of these results. In Section 4, I perform robustness checks on the ME information, introducing alternative estimation methods and further tests on unobservables. In Section 5, I offer concluding remarks.

2 Empirics

2.1 Data

In this section, I describe the datasets employed in this analysis and present their summary statistics.

The first consists of the World Bank Project Performance Ratings (from the "IEG historical project evaluations"), a collection of assessments of all financed projects since the early 1970s. This dataset contains "an independent, desk-based, critical validation of the evidence, content, narrative and ratings"[1] included in end-of-project reports. Of particular interest here is the variable "Project Outcome," defined as "the extent to which the project's major relevant objectives were achieved, or are expected to be achieved, efficiently"[2], a synthetic measure of project success. This indicator ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory). In order to characterize manager and country effects (MEs and CEs respectively), I integrate the available project information with their respective financial information through additional archival documentation.

[1] Refer to http://ieg.worldbankgroup.org/data
[2] Refer to http://ieg.worldbankgroup.org/data

As Panel A of Table 1 highlights, the average project has a mean rating of 4.192 (moderately satisfactory) and a median of 5 (satisfactory), with its 5th percentile being 2 (unsatisfactory) and the 95th being 5. The average year in which the project is approved by the board of the World Bank is 1994.[3] Similarly, the median approval month is June (6), the 5th percentile being February (2) and the 95th being December (12). The mean project has a duration of 6.077 years (between 1 and 10), an average size of 111 million US dollars (between 6.557 and 401.7) and an interest rate of 2.339 (between 0 and 8.25). In the next subsection, I offer additional institutional details on the evaluation procedures and further statistics on the variable "Project Outcome."

The second dataset contains variables which are typically associated with countries' institutional features. In particular, we include:

- parliamentary democracy and constraints on the executive - Besley and Persson (2011) identify that countries with democratic settings and stronger constraints on the executive present a more effective public good provision;
- ethnic fractionalization - Alesina et al. (2003) indicate that the effects of ethnic, linguistic, and religious heterogeneity affect the quality of institutions and growth, particularly via government effectiveness;
- legal origins - Acemoglu et al. (2001) show that the colonial origins of the legal system generate long-term effects in countries' institutions;
- slave trade - Nunn (2008) and Nunn and Wantchekon (2011) construct estimates on the number of slaves exported from each African country during the slave trade and show that these generated negative long-term effects on African institutions;
- a public infrastructure management index (PIMI) - Dabla-Norris et al. (2012) build a public investment efficiency index that captures the institutional environment underpinning public investment management across four different stages: project appraisal, selection, implementation, and evaluation.

[3]Note that while the dataset covers all projects up until 2012, there are relatively few projects available from 2005 onward, due to the fact that projects on average last for 6 years and evaluations can take some time to be submitted and made publicly available.

This database allows to verify whether the CEs correlate with measures of institutions, which would be a natural predictor of the high performance in the delivery of public goods. Panel B of Table 1 reports the summary statistics of these common datasets.

The third dataset consists of the individual characteristics of World Bank managers. It is a novel and hand-collected source relying mostly on individual CVs from publicly available online resources (e.g., individuals' web sites, LinkedIn profiles, book biographies, etc.), used to collect relevant information on 715 managers (i.e., gender, experience, joining year, advanced degrees, previous work experience, languages, country of study, number of publications, and discipline studied). This dataset allows me to describe the characteristics of their careers at the World Bank (i.e., number of country changes, sector changes, total number of projects, average project size, number of promotions/downgradings). I also use this information to verify the correlations between MEs and manager characteristics. As Panel C of Table 1 reports, the average manager: 1) is 26.8% likely to be female; 2) has experienced 3 promotions; 3) has a 3% probability of a downgrade; 4) joined in 1994; 5) has a work experience of 20 years; 6) holds a PhD in 46% of the cases; 7) an MBA in 13.4% of the cases; 8) studied in the United States in 42.8% of the cases; 9) has 6.8 publications; 10) speaks 3.4 languages.

The final database, the EM-DAT database, which is maintained by the Centre for Research on the Epidemiology of Disasters (CRED) at the Université Catholique de Louvain, with support from the Office of U.S. Foreign Disaster Assistance (OFDA), contains information on natural disasters and covers more than 135 countries between 1979 and 2012.[4] I create two variables from this dataset: 1) I aggregate the number of disasters that a country experiences in every year; 2) I define a dummy taking unit value if the number of disasters experienced by a country exceeds the median of the distribution. As Panel D of Table 1 shows, countries experience on average 1.734 disasters per year (0.65 log points), between 0 and 37, and are 54% likely to exceed the median number of disasters in a given year.

[4]The EM-DAT database contains six subgroups of natural disasters: geophysical, meteorological, hydrological, climatological, biological and extraterrestrial. Each of these classifies particular types of hazard through a scientific categorization. For example, a geophysical disaster is a "hazard originating from solid earth. This term is used interchangeably with the term geological hazard" and this indicates earthquake, mass movement and solcanic activity. Refer to http://www.emdat.be for the database and https://www.emdat.be/classification for the classification.

Table 1: Summary Statistics

Variable	(1) Obs.	(2) Mean	(3) Std. Dev.	(4) Median	(5) 5th P.tile	(6) 95th P.tile
Panel A - Project Database						
Project Outcome	3,385	4.192	1.202	5	2	5
Approval Year	3,385	1,994	7.397	1,995	1,981	2,005
Approval Month	3,385	6.206	3.135	6	2	12
Project Length	3,385	6.077	2.556	6	1	10
Project Size	3,385	111.0	198.9	53.36	6.557	401.7
Interest Rate	3,385	2.339	2.872	0.750	0	8.250
Panel B - Country Database						
Democracy	125	0.174	0.319	0	0	0.917
Slave Trade	136	3.542	5.054	0	0	12.99
Fractionalization	112	0.517	0.251	0.527	0.0966	0.883
Legal - ENG	122	0.287	0.454	0	0	1
Legal - FRE	122	0.467	0.501	0	0	1
Exec. Constraints	111	0.230	0.383	0	0	1
PIMI Index	68	1.677	0.658	1.685	0.800	2.970
Panel C - Manager CV Database						
Female	600	0.268	0.443	0	0	1
Promotions	470	3.060	1.058	3	2	5
Downgrade	470	0.0345	0.183	0	0	0
Joining Year	454	1,994	7.205	1,994	1,980	2,005
Experience	454	20.47	7.160	20	10	33
PhD	368	0.466	0.500	0	0	1
MBA	354	0.134	0.341	0	0	1
Studied in US	547	0.428	0.495	0	0	1
Publications	358	6.830	12.66	1	0	29
Languages	381	3.438	1.181	3	2	6
Panel D - Disaster Database						
Disasters	3,093	0.654	0.744	0.693	0	2.079
Dummy Disaster	3,093	0.548	0.498	1	0	1

Notes: This table reports the summary statistics for the four datasets used in this analysis: a) Panel A from the Project Performance Rating Database; b) Panel B from various institutional characteristics at the country level (the specific references are presented in the text); c) Panel C from a new database of manager characteristics; d) Panel D from the EM-DAT natural disaster database. For each panel, the table reports the number of observations (indicated as Obs.), the mean, standard deviation (indicated as Std. Dev.), the median, and the 5th and 95th percentiles (5th P.tile and 95th P.tile respectively).

2.2 Evaluation

In this section, I present the evaluation process of the World Bank, some additional institutional characteristics and further statistics on the "Project Outcome" variable.

Evaluations are organized by the World Bank office responsible for the project (e.g., a region, like Africa, or a sector, like Water), which, in consultation with the project manager, appoints a

team of evaluators. The latter works with other internal World Bank units and local authorities (e.g., borrower, implementing agency, etc.), all of whom provide comments and participate in the evaluation. The output of this process is a document, the "Implementation Completion Report," which assesses the project and provides synthetic manager ratings.

It is important to discuss the incentives the World Bank faces in allocating its resources and evaluating its projects, as its funding and profits may be more or less directly affected. In terms of profits by financing projects, the World Bank is composed of two member institutions[5]: the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA). Both of these institutions offer financial products and policy advice, but while the IDA targets the poorest countries with grants or heavily-subsidized loans, the IBRD gives loans mostly to middle-income and creditworthy low-income countries with positive interest rates. As a result, the former never generates profits, and its funding comes directly from donor countries, while the latter can generate profits that are used to finance future projects through reserves and other financial devices.[6] Given the funding structure of the World Bank, it could be a concern that project ratings are artificially inflated to receive more funding from donors or to push some unofficial agenda.

However, the World Bank incorporates an evaluation process that is robust to such malpractice. On the one hand, the evaluations are indeed organized by internal offices, which ultimately report to the World Bank President, who is the head of the bureaucracy and may influence the ratings to showcase "progress." On the other hand, the World Bank has its own "evaluation watchdog," the Independent Evaluation Group (IEG), which is responsible for monitoring the evaluations and supervising procedures and responsibilities. Importantly, this unit faces different incentives than the rest of the Bank. It does not report to the President, but directly to the World Bank Board, which represents both donors and recipients and supervises the administration of the World Bank. The IEG periodically reevaluates a random share of World Bank projects and produces annual reports, which offers a set of "checks and balances" to maintain a credible set of internal evaluation procedures.

[5]The World Bank is also comprised of three additonal members that are not directly involved in financing country projects : the International Finance Corporation (IFC), Multilateral Investment Guarantee Agency (MIGA), and the International Centre for Settlement of Investment Disputes (ICSID).

[6]Refer to https://www.worldbank.org/en/about/annual-report

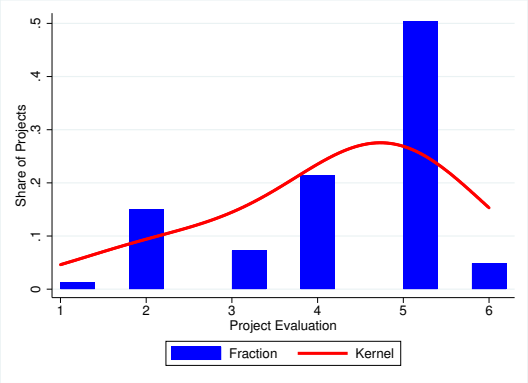
In what follows, I offer some additional summary statistics on the variable "Project Outcome." Figure 1 shows the distribution of projects across the six ratings, showing that 50.34% of the project evaluations achieve a 5 (satisfactory), 21.33% a 4 (moderately satisfactory), 14.98% a 2 (unsatisfactory), 7.24% a 3 (moderately unsatisfactory), and finally 4.87% and 1.24% the extreme values of 6 (highly satisfactory) or 1 (highly unsatisfactory). Figure 2 reports the average evaluation across the thematic groupings of the World Bank (the sectors), the geographic groupings of countries (regions), and across years. The left panel of Figure 2 shows the average project outcome for each of the 15 sectors. As in Table 1, this number is approximately 4, with a few sectors being low-performers (Health, Water, and Agriculture) and others being top-performers (Economic Policy, Poverty Reduction, and Transport). In the next section, I show that such sectoral heterogeneity is not statistically different from zero. The center panel of Figure 2 presents the average project outcome across the regions of the World Bank, demonstrating that African countries are the poorest performers. Further statistical tests reveal that country heterogeneity is substantial and statistically different from zero. Finally, the right panel of Figure 2 depicts the evolution of the mean project outcome over time. Here again the average stays tightly around 4, without exhibiting a trend.

Additional descriptive evidence shows that the variable "Project Outcome" contains information on the quality of projects. In particular, I correlate project evaluations with three variables: 1) economic rate of return; 2) disbursement share; 3) duration in years. The economic rate of return (ERR) measures the internal return of a project by accounting for the costs incurred and the gains generated by its realization, and adjusting market prices to reflect the effects of the project (Duvigneau and Prasad (1984)). The disbursement share is a ratio of how much the World Bank expends for a project relative to the budgeted resources, typically considered "a measure of implementation" (Legovini et al. (2015)). Finally, the duration of a project in years is the simple difference in the number of years between approval and completion.

Figure 3 shows that Project Outcome is highly correlated with all three of these variables. In particular, those projects presenting a high-performing outcome exhibit: 1) higher ERRs, 2) higher disbursements, and 3) lower durations. Beyond this graphic report, I also introduce various controls. Table 2 shows that the correlation between the variable Project Outcome and ERR is robust to including country, sector, and year fixed effects, in addition to project-level

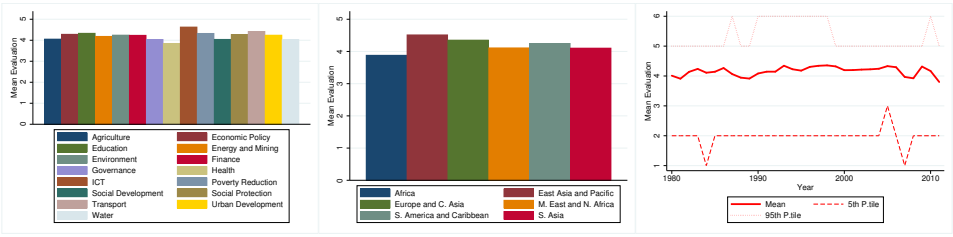
and macro-level controls. Similar tables for the other two variables are available in Appendix A.

Figure 1: Distribution of Project Outcome



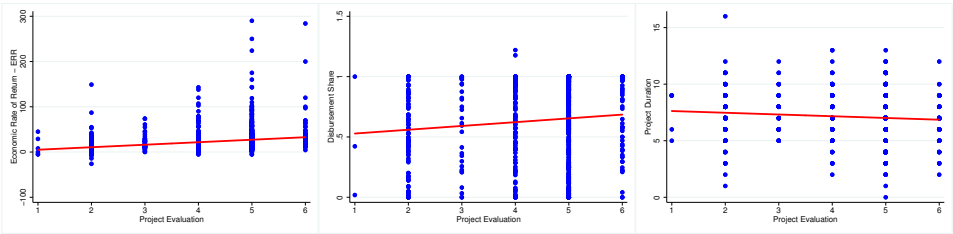
Notes: This figure shows the distribution of the variable "Project Outcome." The x-axis reports the six indicators: 1 indicating a project with a "highly unsatisfactory" outcome, 2 being "unsatisfactory", 3 "moderately unsatisfactory", 4 "moderately satisfactory", 5 "satisfactory" and 6 "highly unsatisfactory". The summary statistics for this variable are available in Table 1.

Figure 2: Average Outcome across Sectors, Regions, and Time



Notes: This figure reports three panels containing additional summary statistics on the variable Project Outcome. The left panel shows the average project outcome across the 15 sectors of the World Bank, the center panel reports the average across the 6 regions defined by the World Bank, while the right panel contains the evolution over time of the average project outcome between 1980 and 2012, including its 5th and 95th percentile.

Figure 3: Correlation between Project Outcome and Other Indicators



Notes: This figure reports three scatterplots, which show the correlation between the variable Project Outcome and the economic rate of return (right panel), the disbursement share (center panel), and the duration (right panel). The corresponding correlations are 0.230***, 0.181***, and -0.092***

Table 2: Economic Returns and Project Outcome

Variables	Economic Rate of Return - ERR					
	(1)	(2)	(3)	(4)	(5)	(6)
Project Outcome	5.743*** (0.649)	6.057*** (0.668)	5.485*** (0.601)	5.223*** (0.546)	5.202*** (0.526)	5.107*** (0.540)
Country Effects	No	Yes	Yes	Yes	Yes	Yes
Sector FE	No	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes	Yes
Project Controls	No	No	No	No	Yes	Yes
Macro Controls	No	No	No	No	No	Yes
Obs.	1409	1409	1409	1409	1409	1409
Adj. R sq.	0.0526	0.189	0.224	0.222	0.223	0.226
Mean Dep. Var.	24.04	24.04	24.04	24.04	24.04	24.04
S.D. Dep. Var.	29.78	29.78	29.78	29.78	29.78	29.78

Notes: This table reports ordinary least square (OLS) estimates. The unit of observation is project level and standard errors are clustered at the country level and reported in brackets. The Economic Rate of Return (ERR) measures the return generated by a project net of its cost, the variable Project Outcome reports an evaluation assessment taking place at the World Bank at the completion of a project. Additional descriptions of the variables are available in the text. Column (1) reports the correlation without any fixed effect and control, (2) introduces a country fixed effect, (3) adds a sector fixed effect, (4) includes, in addition, a year fixed effect, (5) adds project-level controls (interest rate on the project, year and month of approval, financing facility) and finally (6) adds macroeconomic controls (constant GDP per capita and population). ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

2.3 Empirical Model

In this section, I present the empirical model and sample selection.

In estimating manager effects, I follow the approach of Bertrand and Schoar (2003), characterized by the adoption of a fixed effect estimation. This strategy emerges from a general cumulative model of project success, analogous to frameworks on teacher value-added models and student achievement in labor economics (Todd and Wolpin (2003) and Aucejo (2011)).

I characterize country and manager effects through the following regression:

$$y_{imcst} = \iota_m + \iota_c + \iota_s + \iota_t + \varepsilon_{imcst} \tag{1}$$

Here, y_{imcst} is the project outcome variable indicating the success of project i, led by manager m, in country c, of sector s, at time t. I include manager, country, sector, and time fixed effects using the terms ι_m, ι_c, ι_s and ι_t respectively, in line with Denizer et al. (2013).

In order to simplify the interpretation of the fixed effects, I introduce four normalizations, as is standard practice in this literature,

$$\bar{\iota}_m = \sum_{k=1}^{N_m} \frac{\iota_{mk}}{N_m} = 0, \quad \bar{\iota}_c = \sum_{w=1}^{N_c} \frac{\iota_{cw}}{N_c} = 0, \quad \bar{\iota}_s = \sum_{j=1}^{N_s} \frac{\iota_{sj}}{N_s} = 0, \quad \bar{\iota}_t = \sum_{y=1}^{N_y} \frac{\iota_{ty}}{N_y} = 0.$$

These expressions require that the average manager, country, sector, and year fixed effects (e.g., $\bar{\iota}_m$, $\bar{\iota}_c$, $\bar{\iota}_s$, and $\bar{\iota}_t$) are equal to zero. Imposing these normalizations is useful, as it allows to interpret the estimated fixed effects as relative to the mean (e.g., a comparison across managers and relative to the average manager). They also remove all elements of manager/country quantitative comparison. It would not be particularly informative to state that a manager contributes as much as a country does to a project. Rather, I evaluate a manager by benchmarking him against an average manager (normalized to zero for simplicity) and, analogously, I benchmark countries against a given zero-mean reference. By estimating equation (1), I am taking the crudest version of CEs and MEs without including any time-varying project or country controls. However, the robustness section shows that including controls does not change the main results of this paper.

The most critical element in estimating equation (1) is the manager effect, embodied by ι_m. It is crucial to clarify that as World Bank projects are long-lived, several managers may sequentially be in charge of the same project over time. In order to be consistent and compare managers in the same role, I thus exploit different available project documentation to extract information on the manager that presented the project to the World Bank board for approval. More specifically, I manually retrieve this information from the so-called "Project Appraisal Document," and link each project to the manager involved in its initial design and preparation. This data collection approach has three advantages. First, it allows me to compare managers in the same position across different projects. Second, as highlighted by Kilby (2015), project preparation is an essential determinant of project success and therefore manager fixed effects are implicitly measuring this component. Third, the phases leading up to approval involve intensive technical analysis, and discussion with and scrutiny by governments, local agencies, and World Bank internal units — precisely the manager abilities that this paper aims to highlight.

2.3.1 Sample Selection

The identification of the MEs and CEs requires managers to change countries, countries to change managers, and multiple managers to operate at any point in time. If such changes were indeed absent, the two effects would be perfectly collinear and their information indistinguishable. For this reason, I extract a sample such that each country and manager presents at least three projects from the initial universe of more than 8,000 World Bank projects, thus offering common support for the fixed effect estimation. This restriction leaves 3,385 projects from the initial sample, where a manager changes an average of 3.19 countries and 2.11 sectors, while a country hosts an average 25.03 managers in 10.26 sectors. In the robustness section, I show that lowering the threshold on managers to 2 projects or increasing it to 4 does not affect the estimated manager effects.

3 Results

3.1 Summary Statistics on Country and Manager Effects

Table 3 reports the results of the empirical model described in equation (1). Note that both CEs and MEs are jointly statistically different from zero, while this is not the case for the sector fixed effects.

Two findings emerge from this estimation and are displayed in Figure 4. First, the existence of a negative correlation between CEs and MEs, which is statistically different from zero at the 1% level. This correlation provides a first piece of evidence of a negative assortative matching between managers and countries, which I explore in greater detail in the sections below. Second, the presence of substantial within-country variation in manager effects.

A potential issue with these results may arise from the high standard deviation of MEs (0.660), as estimates might be considered to be a mere consequence of sampling error caused by the short manager panel. To counter this, the upper panel of Table 4 reports the summary statistics of MEs for the whole sample, while the lower panel exhibits the latter only for those managers with more than eight, six, or four projects. If the entire standard deviation of MEs was due to sampling error, then this should rapidly decline with a more extended manager panel. However, an inspection of the standard deviations from these longer panels (0.442,

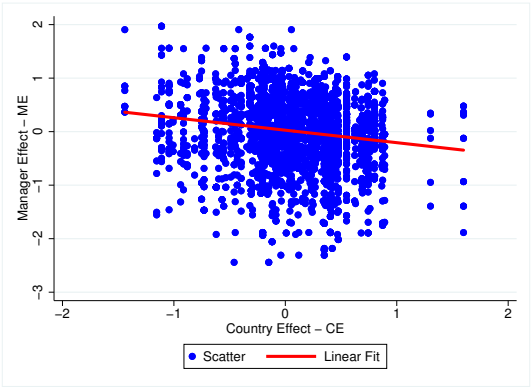
0.494, and 0.551), reveals only a mild decline, consistent with the MEs and their standard deviation containing actual information on manager characteristics. The next sections offer a further validation of the content and information of MEs.

Table 3: Estimating the MEs and CEs

Variables	Project outcome
FE Country	Yes
Number of Countries	127
FE Sector	Yes
Number of Sectors	15
FE Manager	Yes
Number of Managers	715
FE Year	Yes
Number of Years	31
Obs.	3,385
p-value of F-test on CEs	0.000***
p-value of F-test on sector FE	0.573
p-value of F-test on manager FE	0.000***
R^2	0.186
Mean dependent variable	4.192
SD dependent variable	1.202

Notes: This table reports OLS estimates. The unit of observation is project level, and country, sector, manager, and year fixed effects are included. Standard errors are clustered at the country level. Four normalizations are applied to this regression and impose that the mean of the country, sector, manager, and year FE are equal to zero, in order to simplify the interpretation of the fixed effects. "Project Outcome" reports an ordinal rating assigned by the World Bank project manager to the outcome of the project, and is interpreted as a measure of project success. The variable ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory) and the mean is reported in the row "Mean dependent variable." The rows beginning with "FE" indicate the presence of the fixed effect at the country, sector, manager, and year level. The rows beginning with "Number of" report the number of available countries, sectors, managers, and years available in the database. The rows beginning with "p-value of F-test on" provide the results on a test of joint significance on all fixed effects at the country, sector, and manager level. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Figure 4: Country Effects and Manager Effects at Project Level



Notes: This figure depicts a scatterplot, in which each dot is a project, and reports the associated CEs and MEs estimated in Table (1). CEs and MEs are the fixed effects (FE) extracted from a regression of Project Outcome over country, sector, manager, and time FE. The correlation between these two variables is negative and statistically different from zero, -0.158***.

Table 4: Summary Statistics on MEs and CEs

Variable	Obs.	Mean	Std Dev.	Median	5th P.tile	95th P.tile
(1) Manager Effects	3,385	0.007	0.660	0.0467	-1.152	0.990
(2) Country Effects	3,385	0.008	0.448	0.0546	-0.736	0.750
(3) Project Outcome	3,385	4.192	1.202	5	2	5
Manager Level: Different Number of Projects						
(4) MEs: Number of Projects > 8	526	0.0867	0.442	0.0336	-0.884	0.989
(5) MEs: Number of Projects > 6	1,096	0.0310	0.494	0	-0.927	0.862
(6) MEs: Number of Projects > 4	2,050	0.0176	0.551	0.0336	-1.000	0.904

Notes: This table reports the summary statistics of the MEs estimated in Table 3, and the project outcome. MEs are the fixed effects extracted from a regression of Project Outcome. In the upper panel, such summary statistics are presented for all MEs, CEs, and Project Outcome; the lower panel reports the summary statistics for all managers with more than eight, six, and four projects (rows (4), (5), and (6), respectively). Project Outcome reports an ordinal rating assigned by the World Bank project manager to the outcome of the project, and is interpreted as a measure of project success. The variable ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory), and the mean is reported in the row "Mean dependent variable" in Table 3.

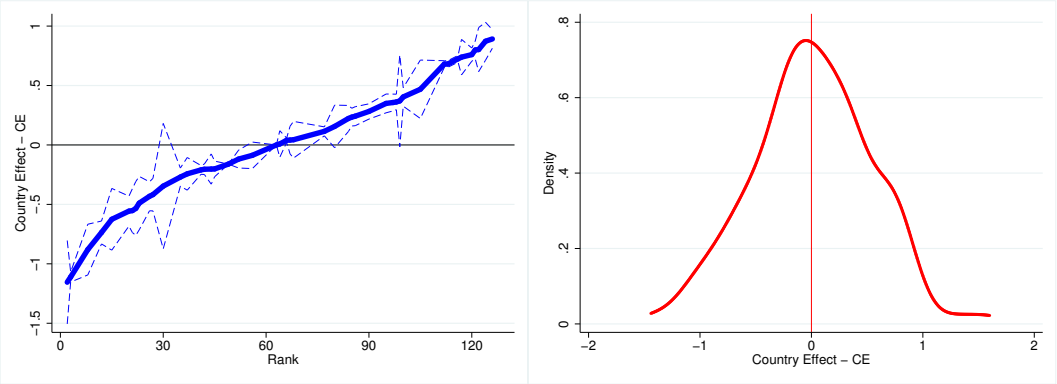
3.2 A Validation of Country and Manager Effects

3.2.1 Inspecting Country Effects

In this section, I explore the correlates of CEs and their main correlates at the institutional level. Conceptually, these may be considered as indices of country capacity to generate public goods, although alternative interpretations cannot be excluded (i.e., financial frictions, corruption, etc.). Therefore, I offer evidence showing that these fixed effects highly correlate with a well-known series of institutional indicators.

Figure 5 offers some summary statistics of CEs. The left panel displays the rankings, including the 95% confidence interval around each estimate, while the right panel reports the CE density. Table 5 shows that the CEs correlate with common institutional variables. On the one hand, parliamentary democracy, high executive constraint, and the index of public infrastructure management (PIMI) (respectively columns (1), (2), and (6)), are all associated positively with CEs. On the other hand, slave trade, ethnic fractionalization, and legal origins (respectively columns (3), (4) and (5)) correlate negatively with CEs. Once all of these are included at the same time in column (7), the index of public goods provision seems to be the strongest correlate.

Figure 5: 95% Confidence Intervals of CEs



Notes: This figure depicts two graphs regarding the country effects. The left panel reports a bar chart of the 95% confidence intervals for CEs. The y-axis shows the point estimate of the CEs from Table 3, and the x-axis gives the rank of the country. The mean of the CEs is indicated with a thick blue line showing the point estimates and the confidence interval is displayed with a dashed line. The right panel shows the distribution of country effects.

Table 5: CEs and Institutional Correlations

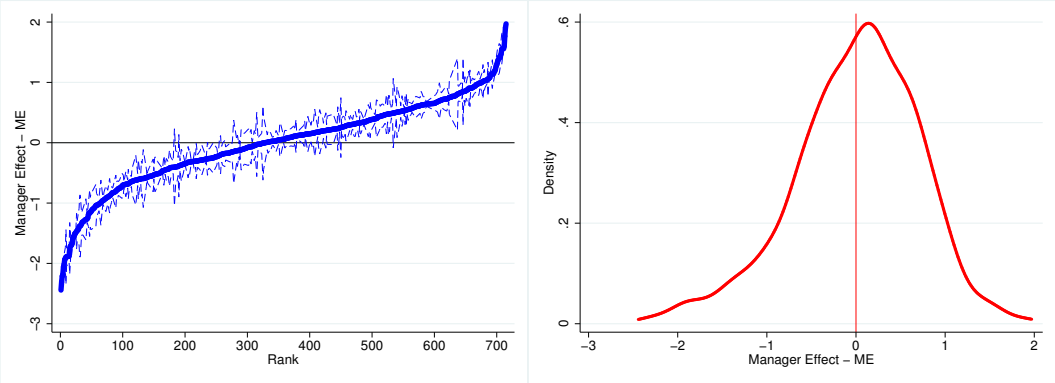
Variables	Country Effects - CEs						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Democracy	0.278*						-0.254
	(0.152)						(0.311)
Exec. Const.		0.301**					0.281
		(0.140)					(0.210)
Slave Trade			-0.0247**				-0.00234
			(0.0104)				(0.0188)
Fractionalization				-0.377**			0.246
				(0.158)			(0.337)
Origins - EN					-0.514***		-0.240
					(0.128)		(0.214)
Origins - FR					-0.421***		-0.0968
					(0.105)		(0.155)
PIM Index						0.243***	0.299***
						(0.0804)	(0.102)
Obs.	125	111	128	112	122	62	55
Adj. R sq.	0.0200	0.0373	0.0478	0.0224	0.126	0.0864	0.111
Mean Dep. Var.	0.0120	0.0162	0.00532	0.0213	0.0147	0.0317	0.0234
S.D. Dep. Var.	0.531	0.538	0.533	0.536	0.536	0.470	0.483

Notes: This table reports OLS estimates. The unit of observation is country level and bootstrapped standard errors are in brackets. CEs is the vector of fixed effects (FE) extracted from a regression of Project Outcome over country, sector, manager, and time fixed effects, as presented in Table 3. Its mean and standard deviation are reported in the final two rows. Parliamentary Democracy and High Executive Constraint are the average of two dummy variables, which respectively take unit value if a country is characterized as a parliamentary democracy or if it presents high constraints on the executive. Ethnic Fractionalization is a continuous variable between zero and one, defined as one minus the Herfindahl index of ethnic group shares. The legal origin variables (English and French) are dummies taking unit value if a country's legal and judicial system are based on one of the countries in brackets. Slave Trade is the measure of the intensity of the slave trade in a country, defined as the natural logarithm of slave exports normalized by a country's historic population interacted with a dummy taking unit value for the 49 countries for which this variable is available. Finally, the PIM index reports the public infrastructure management index. All the corresponding references are available in the text. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

3.2.2 Inspecting Manager Effects

In this section, I observe MEs and verify their correlation with project and individual characteristics. Before doing so, however, I provide a detailed assessment of MEs in the left panel of Figure 6, which shows the point estimate, and the upper and lower bounds of the 95% confidence intervals. The right panel of this figure reports the density of MEs and shows a noticeable left-tail of low-performing managers, which is consistent with the existence of several exceptionally poorly-performing managers.

Figure 6: 95% Confidence Interval of MEs



Notes: This figure reports two panels on MEs. The left panel shows the point estimate of the MEs from Table 3 in thick blue; the dashed line indicates the 95% confidence interval of the point estimates. The right panel displays the distribution of MEs.

In Tables 6 and 7, I present several findings that support the interpretation of MEs as an index of managerial performance. Table 6 correlates MEs to manager characteristics: number of countries changed over the career (column (1)), number of sectors (column (2)), number of managed projects (column (3)), average financial size of projects (column (4)), length of a project in years (column (5)), and all characteristics together (column (6)). Interestingly, the number of sectors does not predict a high-performing manager, while the total number of countries, projects, average size of the loan in millions of USD, and the length of a project, measured by the number of years, are predictors with varying degree of statistical significance. These results are also in line with prior expectations: good managers change fewer countries, are in charge of more projects, which are larger and last for a comparably shorter period. Note that while Kilby (2015) finds that project preparation time is a positive determinant of project success (time spent on the project before its approval), I highlight that the "duration" of a

project (time elapsed from project approval until completion) is negatively correlated with the corresponding manager effect.

Table 6: MEs and Project-Level Correlations

Variables	Manager Effects					
	(1)	(2)	(3)	(4)	(5)	(6)
Num. of Countries	-0.108*					-0.134*
	(0.0589)					(0.0719)
Num. of Sectors		-0.0730				-0.0968
		(0.0538)				(0.0721)
Num. of Projects			0.0559			0.236**
			(0.0801)			(0.107)
Average Loan				0.105***		0.0790**
				(0.0329)		(0.0381)
Project Duration					-0.201***	-0.220***
					(0.0667)	(0.0618)
Obs.	715	715	715	715	715	715
Adj. R-sq.	0.003	0.001	0.001	0.014	0.011	0.030
Mean Dep. Var.	0	0	0	0	0	0
St.Dev. Dep. Var.	0.710	0.710	0.710	0.710	0.710	0.710

Notes: This table reports OLS estimates. The unit of observation is manager level and bootstrapped standard errors are in brackets. MEs is the vector of fixed effects (FE) extracted from a regression of Project Outcome over country, sector, manager, and time fixed effects. Its mean and standard deviation are reported in the final two rows. Number of Countries is a continuous discrete variable, reporting the number of countries over which a manager has shifted during a career. Number of Sectors is a discrete variable, reporting the number of sectors over which a manager has shifted during a career. Number of Projects is a continuous discreet variable, reporting the total number of projects executed by a manager during a career. Average Loan is a continuous variable, reporting the average loan in constant USD held by a manager during an entire career. Project duration measures the average number of years a project takes for each manager. All of these variables are presented through their natural logarithm. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

I next relate MEs to individual characteristics, finding that they do not correlate with gender, year of joining the World Bank, years of experience, or number of languages spoken (see Appendix B for all related results). Table 7 shows characteristics that do correlate with MEs: 1) number of internal promotions, which presents a positive sign; 2) having experienced a downgrade, which instead presents a negative sign; 3) number of publications, with a mildly positive effect, and 4) a dummy for managers that studied in the US, with a negative effect. While the signs of the first three correlations might be expected, this last result could be due to several non-mutually-exclusive reasons. More specifically, a labor market story might suggest that while the World Bank is able to hire average or above-average officials from around the world, it is only able to hire below-average officials who have access to the American labor

market. It might also be that the hiring criteria for Americans are more lenient than for other countries, which could imply that the marginal candidate from the United States is of lower quality, ceteris paribus.

Table 7: MEs and Individual Correlates

Variables	Manager Effects				
	(1)	(2)	(3)	(4)	(5)
Num. of Promotions	0.287**				0.213*
	(0.118)				(0.114)
Downgrade		-0.477**			-0.232
		(0.226)			(0.218)
Num. of Publications			0.0368		0.0459*
			(0.0252)		(0.0258)
Studied in US				-0.229***	-0.0405
				(0.0702)	(0.0810)
Obs.	466	466	354	542	337
Adj. R sq.	0.0195	0.0142	0.00218	0.0248	0.0122
Mean Dep. Var.	0.00564	0.00564	0.00596	0.118	0.0114
S.D. Dep. Var.	0.701	0.701	0.667	0.695	0.668

Notes: This table reports OLS estimates. The unit of observation is manager level and the bootstrapped standard errors are in brackets. MEs is the vector of fixed effects (FE) extracted from a regression of Project Outcome over country, sector, manager, and time fixed effects. Its mean and standard deviation are reported in the final two rows. The regressors are collected from managers' CVs. Num. of Promotions is the natural logarithm of the number of promotions that a manager reports on their CV (or bio). Downgrade is a dummy variable, and takes unit value if a manager has been downgraded to a hierarchically lower position during their career. The variable Num. of Publications is a natural logarithm of a manager's number of working papers or academic publications. Finally the dummy Studied in US takes unit value for managers that pursued part or all of their academic studies in the United States of America (US). ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

3.3 Manager and Country Assignment

3.3.1 Empirical Model and Results

After estimating the MEs and CEs, I study whether and how these two variables correlate through two steps. In this subsection, I correlate the aggregated MEs and CEs through a cross-sectional analysis, while in the next subsection, I also exploit within-country variation to verify how manager assignment changes in response to natural disasters.

For this reason, I aggregate the MEs at the country-year level and implement a within-continent study. Given that the country effect is a time-invariant characteristic of a country, I cannot implement a within-country study and include a country fixed effect, as this would absorb the CE. I therefore propose a within-region specification and exploit the World Bank classification of six global regions, which roughly corresponds to continents. These regions are

East Asia and Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, South Asia and Sub Saharan Africa.

I analyze the following expression:

$$ME_{crt} = a_1 + b_1\, CE_c + X_{2ct}c_1 + \iota_r + \iota_t + \varepsilon_{crt}. \tag{2}$$

Here, the average ME of country c, belonging to region r in year t, ME_{crt}, is regressed over a region and year fixed effect, ι_r and ι_t, respectively. The country heterogeneity is measured through the country effect, CE_c, which is constant for each country over time and should catch the direction of manager-country matching. In Table 8 I report various versions of equation (2): 1) without any control in column (1); introducing some macro time-varying controls (GDP per capita, Population) in column (2); with several project level controls (average project length, financial size of the project, interest rate and others) in column (3), X_{2cgt}; 3) year fixed effects in column (4) and region fixed effects in column (5). In order to simplify the interpretation of the estimates, both ME_{crt} and CE_c have been standardized, and b_1 measures the direction of the assignment.

Table 8 presents the core result and reports evidence of a negative assortative matching, with the sign of the CE variable being unambiguously negative and statistically different from zero across the various specifications, as in Figure 4. This result also holds both in a cross-country perspective, as in columns (1) to (4), and within-regions, as highlighted in column (5). The estimates are also quantitatively large: a country that is one standard deviation lower-performing than the mean country, receives managers 22.6% more-performing than countries with an average performance.

Notably, this negative assortative matching between managers and countries differs substantially from the results of the literature on worker-firm wage determination, which instead finds evidence of positive assortative matching between high-wage workers and high-wage firms using analogous fixed-effects methods or richer structural approaches (see, for example, Bonhomme et al. (2019)). Thus from a methodological stance as well, it is unlikely that a mechanical explanation is driving these findings.

One obvious complication of such a test is the possibility that some managers may be able to alter their assignment and "game the system" to receive higher ratings or avoid undesired

appointments. I consequently assess an alternative setting to verify whether, and to what extent, the World Bank effectively allocates its managers in a negative assortative way. More specifically, I restrict the sample to the first assignments of newly-hired managers. These officials may have significantly less knowledge and leverage to alter their initial appointment and may, therefore, offer a neater test of the negative assortative matching. Table 9 thus offers the same regression as Table 8, but with one key difference: the dependent variable is calculated using only the MEs of those officials working on their first assignment. Hence, I calculate the MEs from the entire sample and all projects, but only consider for each manager their first country assignment. Again, I find evidence of a negative assortative matching, with the sign, significance, and magnitudes all in line with Table 8. While the point estimates are slightly larger in this case, this difference does not seem to be statistically significant. Here, the estimates highlight that a country that is one standard deviation less performing than the mean country receives managers that are 26% more performing than countries with an average performance.

Table 8: Manager-Country Assignment - Country-Level

Variables	Manager Effects				
	(1)	(2)	(3)	(4)	(5)
Country Effects	-0.176***	-0.211***	-0.221***	-0.227***	-0.226***
	(0.0279)	(0.0243)	(0.0214)	(0.0192)	(0.0228)
Macro Controls	No	Yes	Yes	Yes	Yes
Project Controls	No	No	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes
Region FE	No	No	No	No	Yes
Obs.	1694	1694	1694	1694	1694
Adj. R sq.	0.0306	0.0541	0.0641	0.0690	0.0833

Notes: This table reports OLS estimates. The unit of observation is country level and bootstrapped standard errors are in brackets. MEs and CEs denote the vectors of manager and country fixed effects (FE) extracted from a regression of Project Outcome as presented in Table 3. The MEs are then aggregated at the country-year level, while the CEs are country-specific and time-invariant. Both MEs and CEs are standardized. Column (1) does not include any control, while column (2) includes only macro controls (population and real GDP per capita). Column (3) adds project controls (project length, size in million USD and interest rate), and columns (4) and (5) include year and region fixed-effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 9: The Country Assignment of Newly-Hired Managers

Variables	Manager Effects - Newly-Hired Managers				
	(1)	(2)	(3)	(4)	(5)
Country Effects	-0.211***	-0.248***	-0.274***	-0.227***	-0.260***
	(0.0408)	(0.0452)	(0.0504)	(0.0227)	(0.0486)
Macro Controls	No	Yes	Yes	Yes	Yes
Project Controls	No	No	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes
Region FE	No	No	No	No	Yes
Obs.	551	551	551	551	551
Adj. R sq.	0.0383	0.0564	0.0689	0.0690	0.0769

Notes: This table reports OLS estimates. The unit of observation is country level and bootstrapped standard errors are in brackets. Manager Effects and Country Effects denote the vectors of manager and country fixed effects (FE) extracted from a regression of Project Outcome as presented in Table 3. The MEs are then aggregated at country-year level, while the CEs are country-specific and time-invariant. Both MEs and CEs are standardized. In this case, the MEs are calculated only for managers working on their first assignment, hence "newly-hired." Column (1) does not include any control, while column (2) includes only macro controls (population and real GDP per capita). Column (3) adds project controls (project length, size in million USD, and interest rate), and columns (4) and (5) include year and region fixed-effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

3.3.2 Manager Assignment and Disasters

To offer an additional test on the existence of a negative assortative matching, I investigate how manager assignment changes when countries experience temporary negative shocks in their ability to produce public goods. To this end, I exploit natural disasters as a source of exogenous variation for the match.

It is essential to highlight that the World Bank does not directly respond to natural disasters; it neither finances immediate disaster relief nor other types of post-disaster "consumption expenses" (which may be funded by the World Food Programme, the World Health Organization, etc.). However, the World Bank does fund infrastructure, and it is possible that in the aftermath of a disaster, there may be a set of new projects taking place in that country.

Among the several margins available, the World Bank may be particularly effective at achieving gains in the short term by moving better managers to low-performing countries that have been hit by a disaster. While other margins are possible (e.g., elaborating more projects, expanding collaboration with local governments, etc.), these actions can be more time-consuming. Designing a new project takes somewhere between 2 and 3 years, as highlighted by Kilby (2013). For this reason, natural disasters offer an opportunity to study World Bank manager allocation in the event of a disaster.

I consequently explore the following regression:

$$ME_{ct} = a_2 + b_2\, CE_c + c_2 Disaster_{ct-1} + d_2 CE_c \times Disaster_{ct-1} + \iota_c + \iota_t + \varepsilon_{crt}. \qquad (3)$$

in which the average ME of country c, in year t, ME_{ct}, is regressed over a country and year fixed effect, ι_c and ι_t, respectively. Country heterogeneity is still captured through the country effect, CE_c, which is constant for each country over time. In addition to the specification of equation (2), I also introduce a measure of natural disasters in the year prior to the project taking place, $Disaster_{ct-1}$, and interact this measure with the country effect. Exploiting the EM-DAT database on disasters, I create two variables for the empirical analysis: 1) I measure the natural logarithm of the total number of disasters hitting a country; 2) I define a dummy taking unit value whenever a country experiences a number of disasters above the median. A key feature of regression (3) is that, in addition to allowing study of cross-country and cross-regional variation in manager assignment, it also facilitates an examination of within-country variation, given that disasters change over time. To this regard, in a specification of equation (3) I also include country fixed effects and identify the direction of the assignment from the interaction between CE_c and $Disasters_{ct-1}$.

Table 10 reports the results of this estimation and includes the log number of disasters, Table E1 in Appendix E reports results similar to those of Table 10 but uses the above-median dummy to indicate disasters instead. In both cases, I present a version with only the disaster variable and country and year effects (column (1)), with no fixed effects and macro controls (column (2)), followed by project controls, year, and region fixed effects (respectively columns (3), (4) and (5)). Finally, I replace region fixed effects with country fixed effects in column (6) and move from a cross-country (or cross-region) analysis to a within-country exercise. The findings from these tables are consistent with those in Tables 8 and 9. First, CEs present a negative relation to MEs, which is statistically different from zero at 1%, in columns (2) to (5). This coefficient is quite stable in both tables and across specifications. This implies that countries that are one standard deviation less performing than the average country receive managers with an average higher performance of between 10% and 15% a standard deviation. The disaster variable per se does not seem to affect the average quality of assigned managers, except for column (2), which is not robust across specifications.

Perhaps the most interesting finding emerges from the interaction between country effects, CE_c, and natural disasters, $Disaster_{ct-1}$. This variable shows a negative coefficient, which is stable across specifications and statistically different from zero at the 5% level (and mostly at the 1% level). This suggests that beyond the negative assortative matching between managers and countries, in the aftermath of a disaster, low-performing countries receive a "disaster premium" through better managers. This effect is robust to including country fixed effects and, therefore, eliminating all sources of country time-invariant characteristics of manager assignment. Notably, column (6) of Table 10 implies that countries experiencing a 100% increase in natural disasters in a given year, and being one standard deviation poorer performers, receive managers that are 10.6% of a standard deviation stronger. This number is almost three times as large, 28.2%, when considering the binary measure of disaster through the Disaster Dummy in Table E1.

Table 10: Manager-Country Assignment and Disasters

Variables	Manager Effects					
	(1)	(2)	(3)	(4)	(5)	(6)
Country Effects		-0.140***	-0.149***	-0.152***	-0.155***	
		(0.0373)	(0.0389)	(0.0386)	(0.0336)	
Country Effects ×		-0.107***	-0.108***	-0.111***	-0.112***	-0.106**
Disasters		(0.0346)	(0.0348)	(0.0341)	(0.0387)	(0.0437)
Disasters	0.0703	0.0537*	0.0246	0.0330	0.00518	0.0607
	(0.0580)	(0.0310)	(0.0386)	(0.0347)	(0.0479)	(0.0456)
Macro Controls	No	Yes	Yes	Yes	Yes	Yes
Project Controls	No	No	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	Yes	Yes	Yes
Region FE	No	No	No	No	Yes	No
Country FE	Yes	No	No	No	No	Yes
Obs.	1694	1694	1694	1694	1694	1694
Adj. R sq.	0.164	0.0597	0.0679	0.0732	0.0862	0.175

Notes: This table reports OLS estimates. The unit of observation is country level and bootstrapped standard errors are in brackets. MEs and CEs denote the vectors of manager and country fixed effects (FE) extracted from a regression of Project Outcome as presented in Table 3. The MEs are then aggregated at the country-year level, while the CEs are country-specific and time-invariant. Both MEs and CEs are standardized. Disasters measures the natural logarithm of the number of natural disasters experienced by a country in the year before the project begins and varies by country and over time. Column (1) presents only the disaster variable as a regressor with country and year fixed effects. Column (2) includes only macro controls (population and real GDP per capita) and excludes fixed effects. Column (3) adds project controls (project length, size in million USD and interest rate), while columns (4) and (5) also include year and region fixed-effects. In column (6), country fixed effects are included instead of region effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

3.4 Interpretation of the Results

One of the most notable results of this paper is that World Bank managers, as highly specialized international bureaucrats, are assigned to countries through a negative assortative matching: managers exhibiting a stronger performance are allocated to low-performing countries. In analyzing this finding, two points beg further discussion: 1) how to interpret the process of allocation; 2) how to rationalize the negative assortative match. In both cases, several competing and non-mutually exclusive explanations are possible.

First, there are various conceivable views on the functioning of the World Bank and its process of bureaucrat allocation. For example, it could be argued that the World Bank retains full control over the relocation of its staff, implying that managers can be assigned and re-assigned to achieve the organization's objectives.[7] In this "top-down" scenario, a negative assortative match emerges through the explicit assignment of managers to countries over time and a conscious decision of a hierarchy. A different line of argument highlights the institutional complexity of the World Bank, as discussed by Denizer et al. (2013), with an extensive and deep labor market, where allocations emerge through the matching of staff skills and units offering opportunities. In this "bottom-up" approach, the World Bank can govern the direction of the matching by offering incentives and promotions that result in a negative assortative matching. In line with this argument, Chwieroth (2013) examines how World Bank and IMF staff exercise informal governance over projects and decision. Both of these scenarios may be in process and are in line with the key result of this paper.

Second, diverse interpretations can be made of the existence of the negative assortative match. For example, linked to the preferences of the World Bank, as implied by its mission for a "World without poverty." A negative assortative match may maximize "social returns" and reflect the existence of Rawlsian preferences favoring the weakest environments. There seems to be contrasting evidence on this, for example Briggs et al. (2017) find that within under-developed regions, multilateral aid seems to flow mostly to higher income countries or subnational units. Another possibility is that the World Bank tries to minimize the risk of low-performing projects. This may be one of the most quantitatively relevant explanations, as highlighted by Mitchell

[7] Indeed, the World Bank Staff Manual allows re-assignment through planned periodic windows, or at any time within a certain administrative unit (i.e. Vice-Presidency), or even by making the manager redundant. See, in particular, World Bank Staff Rule 5.01 on Reassignment, https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=3832&ver=current.

(2013). Aizenman and Ötker-Robe (2013) argue that the institutional risk aversion of the World Bank may be optimal given the high cost of dealing with failing projects. In addition, the World Bank explicitly acknowledged this issue in its flagship publication, the World Development Report 2014 (World Bank (2014)), which states that "*the World Bank Group is currently undergoing a transformation, which calls for shifting the institutional culture regarding risk from one of extreme risk aversion to one of informed risk taking*". Alternatively, the technology of project success may exhibit some degree of substitutability between countries and World Bank managers and learning about this technology may change project determinants, as discussed by Legovini et al. (2015). It is also possible that due to this technological explanation, high-performing managers are more effective in low-performing environments. At the same time, the funding structure of the World Bank and its relation with the donors may be responsible for the assignment principle. To signal strong results to donors and good "bang for their buck," the World Bank may especially invest in countries whose outcomes are marginal by sending high-performing managers. There could also be political economy considerations and strategic political alignments that drive such allocation, as shown by Dreher et al. (2009), Kersting and Kilby (2018) and Dreher et al. (2019).While all of the above interpretations are plausible, future research might strive to develop a methodological approach able to quantify the relative contribution of these different elements to the negative assortative matching.

4 Robustness Checks

In this section, I present a variety of tests to verify that the estimation and the information of manager effects is robust to various specifications. This section develops through three subsections.

First, I present three tests on the information of the ME estimates from equation (1), these are: 1) implementing a test proposed by Fee et al. (2013), to verify whether MEs from the same manager in different countries correlate; 2) verify that the MEs and CEs estimates are in line with the results of Card et al. (2013), regarding the symmetry to time-varying shocks; 3) evaluate the role of possible interactions between MEs and CEs. These tests and their results follow in the next subsection.

Second, I offer a few tests on the robustness of the MEs estimation: a) with and without controls; b) changing the minimum threshold of projects performed by a manager; c) using the Ordered Logit model rather than the Ordinary Least Square. The tests appear in subsection 4.2 and the corresponding results are available in Appendix C.

Third, I evaluate the sensitivity of the ME estimates to the inclusion of various unobservables, particularly at country time-varying, sector time-varying and manager level. I focus these tests both on the sample used in estimating (1) and a subsample of large countries, which allows investigating in greater detail the previous components. The tests are discussed in subsection 4.3 and the corresponding results are available in Appendix D.

4.1 Testing the Information of MEs

In this subsection I offer three tests showing that MEs contain useful information on the ability of managers to effectively shape project performance. In particular I report: 1) a test in line with the work of Fee et al. (2013); 2) a test in line with the work of Card et al. (2013); 3) some evidence on the negligible role of interactions between MEs and CEs, in line with Bonhomme et al. (2019).

First, Fee et al. (2013) propose a robust testing strategy following the work of Bertrand and Schoar (2003). This aims at investigating the persistence of CEO effects across firms. In essence, they re-estimate the original CEO effects of Bertrand and Schoar (2003) exploiting a broader and longer sample and verify whether the effects of the same manager across different companies are correlated. In order to apply this test to my environment, I recalculate the MEs for managers that worked in at least two countries (or more) and verify how correlated these effects are. This is implemented in two different ways:

1. I estimate multiple effects for the same manager in each country, then I extract for each manager the highest and lowest estimated effects and verify their correlation (left panel of Figure 7)

2. I estimate two effects for all managers that worked in exactly two different countries and correlate these effects.

In both cases the correlation between these fixed effects is positive and statistically different from zero (0.534*** in the left panel of Figure 7 and 0.396** in the right panel). Hence,

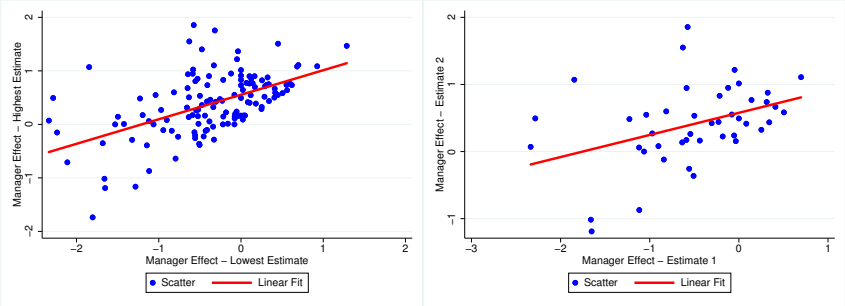
differently from the original paper of Fee et al. (2013) which finds that CEO effects across employers are uncorrelated, I observe a positive effect per manager that is correlated across countries and is in line with the interpretation of MEs as the "success contributed by a manager" in each project.

Second, in their study on workplace heterogeneity, Card et al. (2013) offer a variety of diagnostic tests to deal with the possibility of selection on time varying unobservable shocks. In the absence of random variation, the effects (of managers, CEOs, workers et cetera) may embed time-varying unobservable shocks, which may bias the estimated effects and weaken the information content of the analysis. Card et al. (2013) study wage changes and note that the wage gains, or losses, of workers moving across high and low wage establishments are approximately symmetric between establishments. As a result, workers moving across establishments with similar wages do not show higher wages. I offer a test exactly along these lines, showing the symmetry of the MEs when moving from countries with high effects to those with low effects. In order to produce this test, beyond recalculating the country effect, I also calculate a manager effect for every manager in every country. Subsequently, I generate a database that contains such MEs and CEs by quartile and produce the two panels reported in Figure 8. The left panel shows that there is symmetry in the estimated effects of managers switching from a high effect country to a low effect country. In particular, managers in the first quartile moving from a country with an effect in the first quartile to one with an effect in the third quartile experience small but gradual increases in the effect. However, moving between the third and fourth present a very small negative effect. Symmetrically, managers belonging to the fourth quartile experience mild but gradual decreases in the effect, as they move from a low to a high quartile country. Managers in the second and third quartile show relatively stable effects across quartiles. Another test of such symmetry is offered by the right panel of Figure 8: it shows the mean residuals do not correlate with the quartile of the manager or country effect.

Third, the methodological assumptions behind equation (1) explored in Todd and Wolpin (2003) require a linear cumulative model, as also highlighted by Aucejo (2011). This implies the existence of a linear technology through which countries and managers contribute to project success. This assumption has found some traction in other contexts, for example Bonhomme et al. (2019) find that additivity seems to be a plausible assumption (using Swedish adminis-

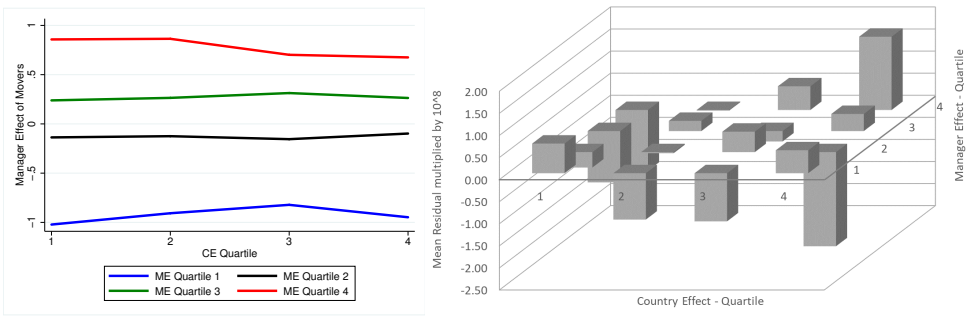
trative data) and a very limited role for interactions in log-earnings. In order to study the role of interactions, I re-estimate equation (1) by adding to country and manager effects also an interaction between these two. This allows exploring in a non-linear manner how managers may react in different countries. However, it rests on a much smaller sample, as not all managers rotate across countries with very different effects. In my estimation, 75% of the country-manager interactions are either exactly zero or close to zero, which may be in line with the findings of Bonhomme et al. (2019). The summary statistics of this effect follow: their mean and median are zero, their standard deviation is 0.263 and the left panel of Figure 9 gives a graphic report of the distribution of these effects. In addition to this, I correlate such interaction with the country and manager effects, as reported in the center and right panels of Figure 9, which show how such correlation is approximately zero for both cases.

Figure 7: The Persistence of Manager Effects



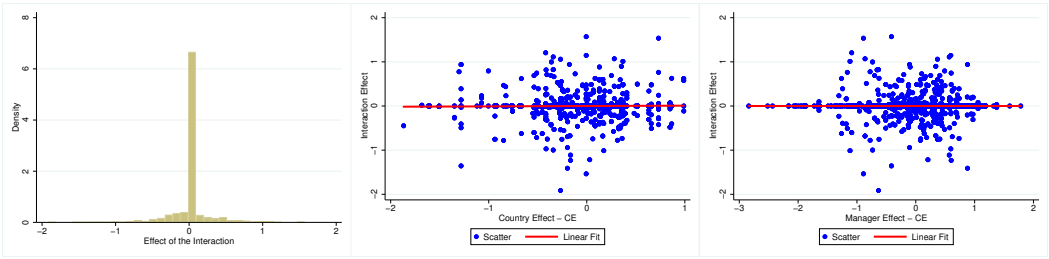
Notes: This figure reports two scatterplots emerging from an estimation in which a manager effect is calculated for every manager across every country. The left panel indicates the correlation between the highest and lowest of these estimates for every manager. The right panel focuses only on those managers that present exactly two estimates. The correlation between these effects is positive and statistically different from zero, respectively 0.534*** and 0.396**.

Figure 8: The Symmetry of Manager Effects



Notes: This figure reports two diagnostic tests on the symmetry of the estimated manager effects for managers moving across countries. The left panel shows the changes in manager effects for managers in each quartile of the manager distribution. In particular, it shows that the effect of managers moving to countries along different quartiles tend to be symmetric. The right panel shows that the residuals do not exhibit a pattern in their relation between managers and countries of different quartiles.

Figure 9: Interactions between Country and Manager Effects



Notes: This figure reports three panels summarizing the role of interactions of country and sector fixed effects. The left panel reports a histogram on the point estimate of the effect, which is zero in 75% of the cases. The two scatterplots in the center and right panel correlate the estimated interaction between country and manager effects respectively with country effects and manager effects. In neither case the correlation is statistically different from zero and is respectively 0.014 and 0.001.

4.2 Robustness to the Estimation of MEs

In this subsection I verify that the manager effects estimated in (1) are highly correlated, often nearly unit correlated, with alternative MEs emerging from three different estimations: 1) augmenting equation (1) to include controls; 2) extending the sample to include more managers, or fewer managers; 3) re-estimating the effects using the Ordered Logit estimator instead of the OLS.

First, I re-estimate the manager effects of equation (1) adding a few controls. In particular I add project-level characteristics (interest rate, financing device, et cetera) and macro controls (population, GDP per capita). Figure C1 in Appendix C shows the results of these estimations. The two figures in the top panel report the correlations between the fixed effects estimates in (1) and the fixed effects estimates by adding project controls (top left panel) and both project and macro controls (top right panel). In both cases the correlations between these effects is nearly one, respectively 0.993 and 0.988. The two figures in the lower panel present the correlations between the manager effects estimated through the two augmented versions of equation (1) and the corresponding country effects. Also in this case the correlation is negative and statistically different from zero, respectively -0.146 and -0.147, in line with the results of Figure 4.

Second, as clarified in section 2.3, I impose a restriction on the sample in order to have managers that participated in at least 3 projects. This secures that the common support hypothesis is respected and there are multiple managers in each country at every time and managers are observed in more than one country at a time. In this section, I verify to what extent this assumption affects my estimates by recalculating the fixed effects for managers with 2 and 4 projects. For this reason I explore a larger dataset, including the original 8,000 projects on which I could match a manager with a project and offer these new estimations. Figure C2 in

Appendix C shows two scatterplots: 1) the left panel compares the MEs estimated in equation (1), based on the 3-project threshold and new estimates employing the 2-project threshold; 2) the right panel compares the MEs based on the 3-project threshold and the 4-project threshold. In both cases, the estimates are not sensitive to the thresholds with correlations being nearly one (respectively 0.989 and 0.976).

Third, given that the project outcome ratings are ordinal, rather than cardinal, using a linear estimator like the OLS "cardinalizes" the ordinal variable and the data generating process. This may be considered problematic and affect the information content of our estimates. While the OLS implies this limitation, it also presents two key benefits: 1) it is common to the literature estimating teacher value added (for example Bertrand and Schoar (2003) among others), making these estimates comparable to an existing benchmark; 2) the interpretation of manager effects becomes particularly complex in a non-cardinal world. In particular, while the interpretation of the OLS leads to interpret the manager effect as the conditional intercept attributed to a manager (e.g., how many "success" points does a manager contribute to a project), in an ordered logit this is not equally straightforward and depends on the level of the left-hand side variable.

In order to verify the relation between the MEs estimated with the ordinary least square (OLS) and ordered logit (OL), I follow the 'blow-up and cluster' (BUC) method based on the work of Baetschmann et al. (2015). This exploits the properties of the conditional maximum likelihood (CML) and is the most efficient estimator in small samples. Through this approach, I reassign every observation in the sample with $K-1$ copies of itself ('blow up' the sample size) and instead of considering an ordinal problem with indicators ranging from 1 to 6, I consider a series of binary relations and different cut-off points. In intuitive terms, this procedure generates fixed effects that are weighted averages of the different binary estimations. After implementing this procedure, I extract the fixed effects of this estimation and show that the manager effects of the OLS and BUC are correlated at 0.874, as shown in Figure C3.

4.3 Manager Effects and Unobservables

In this section I provide additional evidence on the estimated MEs, by proposing an exercise to investigate the role of selected unobservable variables in line with Kane and Staiger (2008). By extracting the manager fixed effects from equation (1), I define a "manager effect" vector,

$ME_m = \widehat{\iota_m}$, which I use as a regressor and verify how its coefficient changes as fixed effects of higher order are included, to account for unobservables in equation (1). The model follows:

$$y_{imcst} = \theta ME_m + C_{imcst}\eta + u_{imcst}, \tag{4}$$

where the project success indicator, y_{imcst}, is regressed on the ME estimates, ME_m, and a vector of controls, C_{imcst}, which includes all the previous variables $(\iota_c, \iota_s, \iota_t)$, project and macro controls, as well as new correlates. Under the hypothesis that MEs estimated in Table 3 are consistent, then the null hypothesis is $\theta = 1$ given the vector of controls C_{imcst} and deviations of θ from the unit value can provide some insights on the direction of the bias implied by unobservables.

This exercise has a clear interpretation. Suppose I am effectively measuring a manager's contribution to a project's success, then the introduction of additional controls or the exploitation of different sources of variation should not affect the main results. If the ME estimates measure the net effect of the manager on a project and are not the result of other factors, then this should have a one-to-one correlation with project performance, whichever level of variation is studied.

Hence, in this section, I estimate equation (4) and test the null hypothesis $\theta = 1$ for the following cases.

1. Country-sector-year specifics. The MEs might be contaminated by shocks taking place in a particular country or sector over time. For this reason, I propose a set of regressions where I control for *country* × *year*, *country* × *sector*, and *sector* × *year* interactions, in different combinations.

2. Control for compensating effort at manager-country level. A manager's effort in a project may depend on the past project performance of a country. For example, by exerting higher effort than usual after a failing project, managers might increase their probability of receiving a promotion and signal a high type. This may induce some time-varying bias, which may bias the ME estimates. To address this point, I introduce an interaction between the ME and lag project outcome and then introduce successive interactions with higher-order fixed effects (sector and project outcome, year and project outcome).

The tests are applied to the following databases:

a. The original sample - this comprises 3,385 projects executed in 127 countries, in 15 sectors, over 31 years, and with 715 managers;

b. A large-country sample - I select the 5 largest recipients of World Bank operations, who register 675 projects overall. The selected countries (and the number of their World Bank projects) are China (198), India (151), Brazil (123), Indonesia (121) and Mexico (82). This has the advantage of presenting more than twice the average number of managers per country, compared to the whole sample.

In all tests, I cannot reject the null hypothesis that $\theta = 1$. In some estimations, the point estimate lies below one (0.8) and in others above one (1.3), but the results are generally in line with the value-added literature. All the tables relative to these robustness checks can be found in Appendix D.

5 Concluding Remarks

In this paper I offer evidence that organizations operating in the public sector may use bureaucrat allocation as an instrument to achieve their objectives. More specifically, I investigate the assignment of World Bank managers to projects in the organization's client countries. From an empirical standpoint, I exploit three key organizational features. First, the possibility of identifying World Bank projects as the main task implemented by a manager. Second, access to records of manager-country assignments over time, matched with performance ratings of each project in World Bank administrative data. Finally, I build and employ a novel and hand-collected database on the CV characteristics of 715 managers to verify the correlates of their performance.

The core analysis is based on an empirical model used to estimate manager and country effects and verify the information content of these variables. While country effects correlate with various institutional characteristics, manager effects correlate with individual characteristics, which can be considered predictors of high productivity (e.g., number of promotions, publications, countries, projects, etc.). After this initial evaluation, I analyze manager-country allocation and find empirical evidence of a negative assortative matching. To verify whether this is an assignment outcome, I offer two further tests. First, I restrict my attention to the allocation of newly-hired managers and verify that their allocation similarly follows a neg-

ative assortative rule. Second, I exploit the occurrence of natural disasters and show that low-performing countries receive stronger managers in the aftermath of such events. Finally, I discuss various interpretations of this result, providing a number of non-mutually exclusive reasons for this assignment: the preferences of the World Bank, the technology of its project success, and its internal labour market.

Understanding the assignment of bureaucrats across tasks is valuable for future research in organizational economics and the political economy of international organizations for two reasons. First, applying these findings to other entities may offer greater insight into the functioning of mission-oriented and international organizations. Second, these results may also further studies assessing the role of human capital in the public sector and its contribution to welfare.

References

Abowd, J. M., Kramarz, F. and Margolis, D. N.: 1999, High wage workers and high wage firms, *Econometrica* **67**(2), 251–333.

Acemoglu, D., Johnson, S. and Robinson, J. A.: 2001, The colonial origins of comparative development: An empirical investigation, *American economic review* **91**(5), 1369–1401.

Adhvaryu, A., Bassi, V., Nyshadham, A. and Tamayo, J. A.: 2020, No line left behind: Assortative matching inside the firm.

Aizenman, J. and Ötker-Robe, İ.: 2013, Managing risk for development: International risk sharing, *Workd Development Report - Background Paper* .

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S. and Wacziarg, R.: 2003, Fractionalization, *Journal of Economic growth* **8**(2), 155–194.

Ashraf, N., Bandiera, O. and Jack, B. K.: 2014, No margin, no mission? a field experiment on incentives for public service delivery, *Journal of Public Economics* **120**, 1–17.

Aucejo, E. M.: 2011, Assessing the role of teacher-student interactions, *Manuscript, Duke University* .

Baetschmann, G., Staub, K. E. and Winkelmann, R.: 2015, Consistent estimation of the fixed effects ordered logit model, *Journal of the Royal Statistical Society: Series A (Statistics in Society)* **178**(3), 685–703.

Bandiera, O., Barankay, I. and Rasul, I.: 2013, Team incentives: Evidence from a firm level experiment, *Journal of the European Economic Association* **11**(5), 1079–1114.

Bandiera, O., Guiso, L., Prat, A. and Sadun, R.: 2015, Matching firms, managers, and incentives, *Journal of Labor Economics* **33**(3), 623–681.

Bertrand, M., Burgess, R., Chawla, A. and Xu, G.: 2017, The glittering prizes: Career incentives and bureaucrat performance, *Working Paper* .

Bertrand, M. and Schoar, A.: 2003, Managing with style: The effect of managers on firm policies, *The Quarterly Journal of Economics* **118**(4), 1169–1208.

Besley, T. and Ghatak, M.: 2005, Competition and incentives with motivated agents, *The American economic review* **95**(3), 616–636.

Besley, T. and Persson, T.: 2011, The logic of political violence, *The quarterly journal of economics* **126**(3), 1411–1445.

Bloom, N., Genakos, C., Sadun, R. and Van Reenen, J.: 2012, Management practices across firms and countries, *The Academy of Management Perspectives* **26**(1), 12–33.

Bloom, N., Lemos, R., Sadun, R. and Van Reenen, J.: 2015, Does management matter in schools?, *The Economic Journal* **125**(584), 647–674.

Bloom, N. and Van Reenen, J.: 2007, Measuring and explaining management practices across firms and countries, *The Quarterly Journal of Economics* **122**(4), 1351–1408.

Bloom, N. and Van Reenen, J.: 2011, Human resource management and productivity, **4**, 1697–1767.

Bonhomme, S., Lamadon, T. and Manresa, E.: 2019, A distributional framework for matched employer employee data, *Econometrica* **87**(3), 699–739.

Briggs, R. C. et al.: 2017, Does foreign aid target the poorest?, *International Organization* **71**(1), 187–206.

Broccolini, C., Lotti, G., Maffioli, A., Presbitero, M. A. F. and Stucchi, R.: 2019, Mobilization effects of multilateral development banks, *World Bank Economic Review (Forthcoming)* .

Burgess, S., Propper, C., Ratto, M., Scholder, K., von Hinke, S. and Tominey, E.: 2010, Smarter task assignment or greater effort: the impact of incentives on team performance, *The Economic Journal* **120**(547), 968–989.

Burgess, S., Propper, C., Ratto, M. and Tominey, E.: 2017, Incentives in the public sector: Evidence from a government agency, *The Economic Journal* **127**(605).

Card, D., Heining, J. and Kline, P.: 2013, Workplace heterogeneity and the rise of west german wage inequality, *The Quarterly journal of economics* **128**(3), 967–1015.

Chetty, R., Friedman, J. N. and Rockoff, J. E.: 2014, Measuring the impacts of teachers i: Evaluating bias in teacher value-added estimates, *The American Economic Review* **104**(9), 2593–2632.

Chwieroth, J. M.: 2013, âthe silent revolution:â how the staff exercise informal governance over imf lending, *The Review of International Organizations* **8**(2), 265–290.

Colonnelli, E., Prem, M. and Teso, E.: 2017, Patronage in the allocation of public sector jobs, *Working Paper* .

Coviello, D., Ichino, A. and Persico, N.: 2014, Time allocation and task juggling, *The American Economic Review* **104**(2), 609–623.

Dabla-Norris, E., Brumby, J., Kyobe, A., Mills, Z. and Papageorgiou, C.: 2012, Investing in public investment: an index of public investment efficiency, *Journal of Economic Growth* **17**(3), 235–266.

Dal Bó, E., Finan, F. and Rossi, M. A.: 2013, Strengthening state capabilities: The role of financial incentives in the call to public service, *The Quarterly Journal of Economics* **128**(3), 1169–1218.

De Rassenfosse, G., Decarolis, F., Giuffrida, L. M., Iossa, E., Mollisi, V., Raiteri, E., Spagnolo, G. et al.: 2019, Buyers' role in innovation procurement.

Decarolis, F., Giuffrida, L. M., Iossa, E., Mollisi, V. and Spagnolo, G.: 2018, Bureaucratic competence and procurement outcomes.

Denizer, C., Kaufmann, D. and Kraay, A.: 2013, Good countries or good projects? macro and micro correlates of world bank project performance, *Journal of Development Economics* **105**, 288–302.

Deserranno, E.: 2019, Financial incentives as signals: experimental evidence from the recruitment of village promoters in uganda, *American Economic Journal: Applied Economics* **11**(1), 277–317.

Dreher, A., Lang, V. and Richert, K.: 2019, The political economy of international finance corporation lending, *Journal of Development Economics* .

Dreher, A., Sturm, J.-E. and Vreeland, J. R.: 2009, Development aid and international politics: Does membership on the un security council influence world bank decisions?, *Journal of Development Economics* **88**(1), 1–18.

Duvigneau, J. C. and Prasad, R. N.: 1984, Guidelines for calculating financial and economic rates of return wbg for dfc projects, *World Bank Technical Paper Number 33* .

Estache, A., Garsous, G. and da Motta, R. S.: 2016, Shared mandates, moral hazard, and political (mis) alignment in a decentralized economy, *World Development* **83**, 98–110.

Fee, C. E., Hadlock, C. J. and Pierce, J. R.: 2013, Managers with and without style: Evidence using exogenous variation, *The Review of Financial Studies* **26**(3), 567–601.

Fenizia, A.: 2019, Managers and productivity in the public sector.

Hanushek, E.: 1971, Teacher characteristics and gains in student achievement: Estimation using micro data, *The American Economic Review* **61**(2), 280–288.

Isham, J. and Kaufmann, D.: 1999, The forgotten rationale for policy reform: the productivity of investment projects, *The Quarterly Journal of Economics* pp. 149–184.

Isham, J., Kaufmann, D. and Pritchett, L. H.: 1997, Civil liberties, democracy, and the performance of government projects, *The World Bank Economic Review* **11**(2), 219–242.

Janke, K., Propper, C. and Sadun, R.: 2019, The impact of ceos in the public sector: Evidence from the english nhs, *Technical report*, National Bureau of Economic Research (25853).

Kane, T. J. and Staiger, D. O.: 2008, Estimating teacher impacts on student achievement: An experimental evaluation, *Technical report*, National Bureau of Economic Research.

Kersting, E. and Kilby, C.: 2018, Do domestic politics shape us influence in the world bank?, *The Review of International Organizations* pp. 1–30.

Kilby, C.: 2013, The political economy of project preparation: An empirical analysis of world bank projects, *Journal of Development Economics* **105**, 211–225.

Kilby, C.: 2015, Assessing the impact of world bank preparation on project outcomes, *Journal of Development Economics* **115**, 111–123.

Legovini, A., Di Maro, V. and Piza, C.: 2015, Impact evaluation helps deliver development projects, *World Bank Policy Research Working Paper 7157* .

Mitchell, A.: 2013, Risk and resilience: From good idea to good practice–a scoping study for the experts group on risk and resilience, *Organization for Economic Co-operation and Development, Paris* .

Nunn, N.: 2008, The long-term effects of africa's slave trades, *The Quarterly Journal of Economics* **123**(1), 139–176.

Nunn, N. and Wantchekon, L.: 2011, The slave trade and the origins of mistrust in africa, *American Economic Review* **101**(7), 3221–52.

Oyer, P., Schaefer, S. et al.: 2011, Personnel economics: Hiring and incentives, *Handbook of Labor Economics* **4**, 1769–1823.

Presbitero, A. F.: 2016, Too much and too fast? public investment scaling-up and absorptive capacity, *Journal of Development Economics* **120**, 17–31.

Rasul, I. and Rogger, D.: 2018, Management of bureaucrats and public service delivery: Evidence from the nigerian civil service, *The Economic Journal* **128**(608), 413–446.

Todd, P. E. and Wolpin, K. I.: 2003, On the specification and estimation of the production function for cognitive achievement, *The Economic Journal* **113**(485).

World Bank: 2014, Risk and opportunity - managing risk for development, *World Development Report* .

Online Appendix

Appendix A: Project Outcome, Duration and Disbursements

Table A1: Disbursements and Project Outcome

Variables	Share of Disbursed Funds over Total					
	(1)	(2)	(3)	(4)	(5)	(6)
Project	0.0547***	0.0491***	0.0479***	0.0518***	0.0490***	0.0494***
Outcome	(0.00826)	(0.00785)	(0.00753)	(0.00819)	(0.00792)	(0.00789)
Country Effects	No	Yes	Yes	Yes	Yes	Yes
Sector FE	No	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes	Yes
Project Controls	No	No	No	No	Yes	Yes
Macro Controls	No	No	No	No	No	Yes
Obs.	1629	1629	1629	1629	1629	1629
Adj. R sq.	0.0320	0.158	0.165	0.270	0.310	0.313
Mean Dep. Var.	0.620	0.620	0.620	0.620	0.620	0.620
S.D. Dep. Var.	0.366	0.366	0.366	0.366	0.366	0.366

Notes: This table reports OLS estimates. The unit of observation is project level and standard errors are clustered at country level and reported in brackets. The disbursement share measures the share of funding that the World Bank disbursed in a project against an initial stated objective, the variable Project Outcome reports an evaluation assessment taking place at the World Bank at the completion of a project. Column (1) reports the correlation without any fixed effect and control, (2) introduces a country fixed effect, (3) adds also a sector fixed effect, (4) includes in addition a year fixed effect, (5) adds project-level controls (interest rate on the project, year and month of approval, financing facility) and finally (6) adds also macroeconomic controls (constant GDP per capita and population). ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Table A2: Project Duration and Outcome

Variables	Project Duration - Years					
	(1)	(2)	(3)	(4)	(5)	(6)
Project	-0.197***	-0.197***	-0.147***	-0.128***	-0.0719**	-0.0699**
Outcome	(0.0538)	(0.0406)	(0.0351)	(0.0311)	(0.0296)	(0.0294)
Country Effects	No	Yes	Yes	Yes	Yes	Yes
Sector FE	No	No	Yes	Yes	Yes	Yes
Year FE	No	No	No	Yes	Yes	Yes
Project Controls	No	No	No	No	Yes	Yes
Macro Controls	No	No	No	No	No	Yes
Obs.	3385	3385	3385	3385	3385	3385
Adj. R sq.	0.00827	0.110	0.339	0.457	0.585	0.586
Mean Dep. Var.	6.077	6.077	6.077	6.077	6.077	6.077
S.D. Dep. Var.	2.556	2.556	2.556	2.556	2.556	2.556

Notes: This table reports OLS estimates. The unit of observation is project level and standard errors are clustered at country level and reported in brackets. The duration measures the number of years between the approval and the completion of a project,

the variable Project Outcome reports an evaluation assessment taking place at the World Bank at the completion of a project. Column (1) reports the correlation without any fixed effect and control, (2) introduces a country fixed effect, (3) adds also a sector fixed effect, (4) includes in addition a year fixed effect, (5) adds project-level controls (interest rate on the project, year and month of approval, financing facility) and finally (6) adds also macroeconomic controls (constant GDP per capita and population). ***, ** and * indicate significance at the 1%, 5% and 10% level, respectively.

Appendix B: Manager Effects and Other Individual Covariates

Table B1: Manager Effects and Careers

Variables	Manager Effects				
	(1)	(2)	(3)	(4)	(5)
Female Dummy	-0.0555				
	(0.0639)				
Joining Year		0.000			
		(0.005)			
Experience			-0.00122		
			(0.00493)		
PhD				0.0394	
				(0.0735)	
MBA					-0.00384
					(0.0919)
Observations	595	449	449	365	349
R-squared	0.001	0.000	0.000	0.001	0.000

Notes: This table reports OLS estimates. The unit of observation is manager level and robust standard errors are in brackets. Manager effects is the vector of fixed effects (FE) extracted from a regression of Project Outcome over country, sector, manager, and time FE. The right-hand side variables are collected from manager CVs. Female takes unit value if the manager is female. Joining Year is the year in which a manager joined the World Bank. Experience measures the number of years a manager has been at the World Bank. PhD and MBA are dummies taking unit value if the CV of a World Bank manager reports having a PhD or MBA degree.

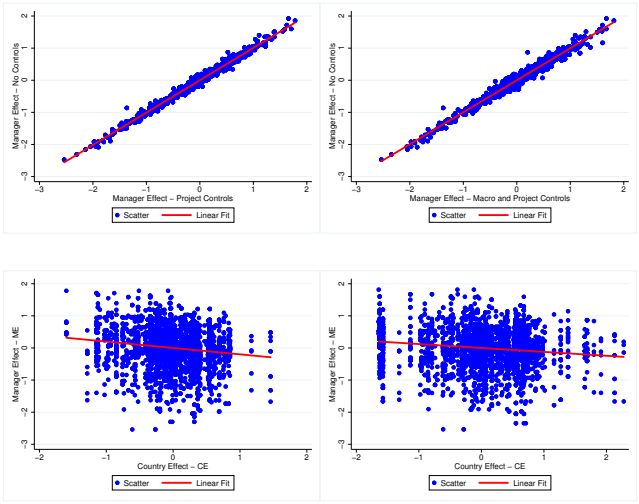
Table B2: Manager Effects and Careers

Variables	Manager Effects				
	(1)	(2)	(3)	(4)	(5)
Worked for IMF	0.00992				
	(0.211)				
Worked for UN		0.0251			
		(0.124)			
Worked for NM			-0.102		
			(0.0847)		
Worked in PS				-0.0156	
				(0.0613)	
Ln Num. of Languages					-0.163
					(0.122)
Observations	715	715	715	715	376
R-squared	0.000	0.000	0.002	0.000	0.003

Notes: This table reports OLS estimates. The unit of observation is manager level and robust standard errors are in brackets. Manager effects is the vector of fixed effects (FE) extracted from a regression of Project Outcome over country, sector, manager, and time FE, including 24 controls and the mean lag project outcome, as presented in Table 1, column (1). The right-hand side variables are collected from manager CVs. Worked for IMF, UN, NM and PS take unit value if a manager has worked for the International Monetary Fund (IMF), for the United Nations (UN), for a National Ministry (NM) or in the private sector (PS). Ln number of languages measures the logarithm of the number of languages spoken by a manager, as recorded in his CV.

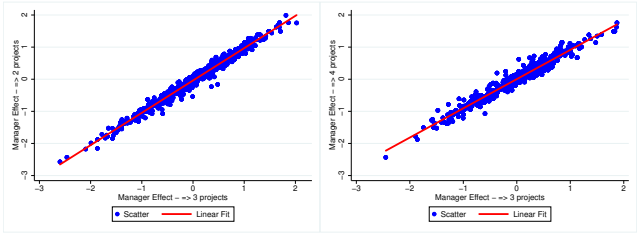
Appendix C: Robustness to the Estimation of Manager Effects

Figure C1: Manager Effects Across Estimations



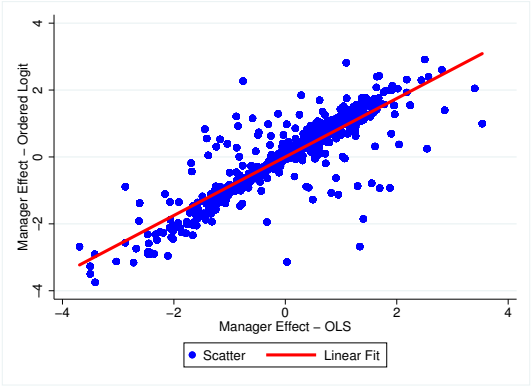
Notes: This figure reports four panels. The panels on the left report estimates of manager effects in which equation (1) report also project-level controls. The panels on the right report estimates of manager effects in which both macro and project controls are introduced. The figure in the top left corner shows a scatterplot between the effects from the baseline of equation (1) and the version including project controls, these exhibit a correlation of 0.993***. The figure in the bottom left corner exhibits the scatterplot between MEs and CEs under the estimation of (1) including project controls: the correlation between these two variables is still negative and statistically different from zero, -0.146***. The figure in the top right corner shows a scatterplot between the effects from the baseline of equation (1) and the version including project and macro controls, these exhibit a correlation of 0.988***. The figure in the bottom right corner exhibits the scatterplot between MEs and CEs under the estimation of (1) including project and macro controls: the correlation between these two variables is still negative and statistically different from zero, -0.147***.

Figure C2: Manager Effects and Sample



Notes: These figures report two scatterplots between the manager effects estimated imposing a threshold of 3 on the minimum number of projects per manager (as baseline) and lowering this threshold to 2 (left panel) and increasing this threshold to 4 (right panel). The correlation between these effects is respectively 0.989*** and 0.976***.

Figure C3: MEs estimated with OLS and Ordered Logit



Notes: This figure reports a scatterplot of the manager effects estimated using the ordinary least square and the ordered logit. The correlation between these effects is 0.874***.

Appendix D: Manager Effects and Unobservables

Manager Effects: Original Sample

In this appendix, I validate the ME model for the original sample, by adding several fixed effects interactions. In Table D1, I take into account country time-varying, sector time-varying, and country sector-varying unobserved variation, and the point estimates of the ME variable are very close to 1 in all specifications. In Tables D2 and D3, I explore a test to account for compensating effort at manager--country level. The point estimates are tightly around one, indicating that this might be in place, but the estimate is still not statistically different from zero. Therefore, this first check provides some support to the previous exercise.

Table D1: MEs and Country, Sector, and Year Interactions: Original Sample

Variables	Project Outcome				
	(1)	(2)	(3)	(4)	(5)
MEs	0.865***	0.854***	0.985***	0.978***	0.986***
	(0.0311)	(0.0315)	(0.0244)	(0.0238)	(0.0238)
Observations	3,385	3,385	3,385	3,385	3,385
R-squared	0.250	0.258	0.386	0.394	0.401
Macro Controls	Yes	Yes	Yes	Yes	Yes
Project Controls		Yes	Yes	Yes	Yes
Country FE			Yes	Yes	Yes
Sector FE				Yes	Yes
Year FE					Yes

Notes: This table reports OLS estimates. The unit of observation is project level and country, sector, manager, and year fixed effects are included. Standard errors are adjusted for 127 country clusters. Project Outcome reports an ordinal rating assigned by the World Bank project manager to the outcome of the project, and it is interpreted as a measure of project success. The variable

ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory). CEs and MEs are derived from a regression of project outcome over all FE, including 22 controls and the mean lag project outcome, as shown in Table 1, column (1). In column (1) I only include macro controls, while project controls and the lagged dependent variable are added in columns (2) - (5), with country, sector and year FE respectively. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table D2: MEs and Country Lag Project Outcome Interactions: Original Sample

Variables	Project Outcome					
	(1)	(2)	(3)	(4)	(5)	(6)
MEs	0.986***	0.939***	0.973***	0.947***	0.961***	0.939***
	(0.0234)	(0.0352)	(0.0302)	(0.0487)	(0.0326)	(0.0566)
Observations	3,385	3,385	3,385	3,385	3,385	3,385
R-squared	0.401	0.587	0.491	0.659	0.540	0.726
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Project Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country × Year FE		Yes		Yes		Yes
Country × Sector FE			Yes	Yes	Yes	Yes
Sector × Year FE					Yes	Yes

Notes: This table reports OLS estimates. The unit of observation is project level and country, sector, manager, and year fixed effects are included. Standard errors are adjusted for 127 country clusters. Project Outcome reports an ordinal rating assigned by the World Bank project manager to the outcome of the project, and it is interpreted as a measure of project success. The variable ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory). CEs and MEs are derived from a regression of project outcome over all FE, including 22 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) includes all controls and the lagged dependent variable, columns (2) - (6) include progressively Country x Year, Country x Sector and Sector x Year FE in various combinations.

Table D3: MEs and Manager Lag Project Outcome Interactions: Original Sample

Variables	Project Outcome				
	(1)	(2)	(3)	(4)	(5)
MEs	0.962***	0.943***	1.044***	1.042***	1.027***
	(0.142)	(0.144)	(0.123)	(0.123)	(0.123)
Observations	3,385	3,385	3,385	3,385	3,385
R-squared	0.250	0.258	0.386	0.394	0.401
Macro Controls	Yes	Yes	Yes	Yes	Yes
ME × Lag Dep. Var	Yes	Yes	Yes	Yes	Yes
Project Controls		Yes	Yes	Yes	Yes
Country FE			Yes	Yes	Yes
Sector FE				Yes	Yes
Year FE					Yes

Notes: This table reports OLS estimates. The unit of observation is project level and country, sector, manager, and year fixed effects are included. Standard errors are adjusted for 127 country clusters. Project Outcome reports an ordinal rating assigned by the World Bank project manager to the outcome of the project, and it is interpreted as a measure of project success. The variable ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory). CEs and MEs are derived from a regression of project outcome

over all FE, including 22 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) includes all controls, the lagged dependent variable and an interaction between the manager effect and the lagged dependent variable, column (2) - (6) include progressively additional fixed effects.

Manager Effects: Large-Country Sample

The following tables provide another empirical test of the model expressed in equation (5) for the large-country sample, by adding several fixed effect interactions. Table D4 confirms that there is no large-country bias; by studying the country time-varying, sector time-varying, and country sector-varying unobserved variations, it shows that the point estimates of the ME variable are very close to 1 in all specifications.

Table D4: MEs and Country, Sector, and Year Interactions: Large-Country Sample

Variables	Project Outcome				
	(1)	(2)	(3)	(4)	(5)
MEs	0.858***	0.875***	0.937***	0.929***	0.930***
	(0.0540)	(0.0545)	(0.0568)	(0.0563)	(0.0591)
Observations	675	675	675	675	675
R-squared	0.286	0.309	0.357	0.384	0.408
Macro Controls	Yes	Yes	Yes	Yes	Yes
Project Controls		Yes	Yes	Yes	Yes
Country FE			Yes	Yes	Yes
Sector FE				Yes	Yes
Year FE					Yes

Notes: This table reports OLS estimates. The unit of observation is project level and country, sector, manager, and year fixed effects are included. Standard errors are adjusted for 127 country clusters. Project Outcome reports an ordinal rating assigned by the World Bank project manager to the outcome of the project, and it is interpreted as a measure of project success. The variable ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory). CEs and MEs are derived from a regression of project outcome over all FE, including 22 controls and the mean lag project outcome, as shown in Table 1, column (1). In column (1) I only include macro controls, the project controls and additional fixed effects are progressively included in columns (2) - (5). ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table D5: MEs and Manager Lag Project Outcome Interactions: Small Sample

Variables	Project Outcome					
	(1)	(2)	(3)	(4)	(5)	(6)
MEs	0.930***	0.867***	0.910***	0.834***	0.859***	0.822***
	(0.0591)	(0.0703)	(0.0695)	(0.0781)	(0.0830)	(0.119)
R-squared	0.408	0.479	0.427	0.508	0.573	0.639
Observations	675	675	675	675	675	675
R-squared	0.403	0.479	0.421	0.508	0.570	0.639
Macro Controls	Yes	Yes	Yes	Yes	Yes	Yes
Project Controls	Yes	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Country × Year FE		Yes	Yes	Yes	Yes	Yes
Country × Sector FE				Yes	Yes	Yes
Sector × Year FE					Yes	Yes

Notes: This table reports OLS estimates. The unit of observation is project level and country, sector, manager, and year fixed effects are included. Standard errors are adjusted for 127 country clusters. Project Outcome reports an ordinal rating assigned by the World Bank project manager to the outcome of the project, and it is interpreted as a measure of project success. The variable ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory). CEs and MEs are derived from a regression of project outcome over all FE, including 22 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) includes all controls and the lagged dependent variable, columns (2) - (6) include progressively Country x Year, Country x Sector and Sector x Year FE in various combinations.

Table D6: MEs and Sector–Manager Interactions: Large-Country Sample

Variables	Project Outcome					
	(1)	(2)	(3)	(4)	(5)	(6)
MEs	1.012	1.052	1.503*	1.514*	1.702**	
	(0.517)	(0.542)	(0.655)	(0.577)	(0.534)	
Observations	675	675	675	675	675	
R-squared	0.287	0.309	0.358	0.386	0.413	
Macro Controls	Yes	Yes	Yes	Yes	Yes	
ME × Lag Dep. Var	Yes	Yes	Yes	Yes	Yes	
Project Controls		Yes	Yes	Yes	Yes	
Country FE			Yes	Yes	Yes	
Sector FE				Yes	Yes	
Year FE					Yes	

Notes: This table reports OLS estimates. The unit of observation is project level and country, sector, manager, and year fixed effects are included. Standard errors are adjusted for 127 country clusters. Project Outcome reports an ordinal rating assigned by the World Bank project manager to the outcome of the project, and it is interpreted as a measure of project success. The variable ranges from 1 (highly unsatisfactory) to 6 (highly satisfactory). CEs and MEs are derived from a regression of project outcome over all FE, including 22 controls and the mean lag project outcome, as shown in Table 1, column (1). Column (1) includes macro controls, the lagged dependent variable and an interaction between the manager effect and the lagged dependent variable, columns (2) - (6) include progressively additional fixed effects and project controls.

Appendix E: Manager Assignment and Disasters

This appendix reports the same specification shown in Table 10 regarding the manager premium for countries experiencing natural disasters. The only difference is that instead of measuring disasters through the log number of disasters, I define a dummy taking unit value for years in which a country exceeds the median number of disasters.

Table E1: Manager-Country Assignment and Disaster Dummy

Variables	Manager Effects					
	(1)	(2)	(3)	(4)	(5)	(6)
Country Effects		-0.125***	-0.136***	-0.136***	-0.144***	
		(0.0390)	(0.0380)	(0.0423)	(0.0450)	
Country Effects ×		-0.149***	-0.147***	-0.155***	-0.144***	-0.282***
Disaster Dummy		(0.0534)	(0.0467)	(0.0538)	(0.0541)	(0.0348)
Disaster Dummy	0.0116	0.0303	0.000782	0.00161	-0.0185	-0.0229
	(0.0677)	(0.0650)	(0.0557)	(0.0486)	(0.0701)	(0.0622)
Macro Controls	No	Yes	Yes	Yes	Yes	Yes
Project Controls	No	No	Yes	Yes	Yes	Yes
Year FE	Yes	No	No	Yes	Yes	Yes
Region FE	No	No	No	No	Yes	No
Country FE	Yes	No	No	No	No	Yes
Obs.	1694	1694	1694	1694	1694	1694
Adj. R sq.	0.0345	0.0584	0.0674	0.0727	0.0857	0.0782

Notes: This table reports OLS estimates. The unit of observation is country level and bootstrapped standard errors are in brackets. MEs and CEs denote the vectors of manager and country fixed effects (FE) extracted from a regression of Project Outcome as presented in Table 3. The MEs are then aggregated at the country-year level, while the CEs are country-specific and time-invariant. Both MEs and CEs are standardized. The Disaster dummy takes unit value if a country experiences a number of disasters higher than the median in the year prior to the project approval. Column (1) presents only the disaster variable as a regressor with country and year fixed effects. Column (2) includes only macro controls (population and real GDP per capita) and excludes fixed effects. Column (3) adds project controls (project length, size in million USD and interest rate), while columns (4) and (5) respectively include year and region fixed-effects. In column (6), country fixed effects are included instead of region effects. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.